SHRIDEVI
EDUCATION

Sri Shridevi Charitable Trust (R.)

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY

Sira Road, Tumkur - 572 106, Karnataka, India.

Phone: 0816 - 2212629 | Principal: 0816 - 2212627, 9686114899 | Telefax: 0816 - 2212628

Email: info@shrideviengineering.org, principal@shrideviengineering.org | Website: www.shrideviengineering.org

(Approved by AICTE, New Delhi, Recognised by Govt. of Karnataka and Affiliated to Visvesvaraya Technological University, Belagavi)

ESTD:2002

20 YEARS Academic Excellence

2018-19

Internal assessment Question paper with scheme of evaluation

25 Copies

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY, TUMKUR-06
DEPARTMENT OF MATHEMATICS

III-semester: III-Internal assessment Test: November-2018

17MAT31-Engineering Mathematics-III(CVE branch)

An ISO 9001:2015 Certified Institute

FS 543667

Note: Answer any **two full questions** choosing one from each part

Time:75min] [Max marks:30

PART-I

1. **a)** Find the real root of the equation $f(x) = x^3 - 2x - 5 = 0$ by Regula falsi method correct to three decimal places. (5Marks)

b) Find the root of the equation $cosx = xe^x$by Regula falsi method correct to four decimal places. (5Marks)

c) Fit a straight line $y = ax + b$ for the following data by the method of least square (5Marks)

x	1	3	4	6	8	9	11	14
y	1	2	4	4	5	7	8	9

OR

2. **a)** Fit a second degree parabola $y = ax^2 + bx + c$ in the least square sense for the following data (5Marks)

x	1.0	1.5	2.0	2.5	3.0	3.5	4.0
y	1.1	1.3	1.6	2.0	2.7	3.4	4.1

b) Find the correlation coefficient between x and y of the following data (5Marks)

x	78	89	97	69	59	79	68	57
y	125	137	156	112	107	138	123	108

c) The two regression equations of the variables x and y are $x = 19.13 - 0.87y\ and\ y = 11.64 - 0.50x$.Find mean value of x and y and also coefficient of correlation between x and y. (5Marks)

P.T.O

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY, TUMKUR-06
DEPARTMENT OF MATHEMATICS

III-semester: III-Internal assessment Test: November-2018

17MAT31-Engineering Mathematics-III(CVE branch)

An ISO 9001:2015 Certified Institute

FS 543667

Note: Answer any **two full questions** choosing one from each part

Time:75min] [Max marks:30

PART-I

1. **a)** Find the real root of the equation $f(x) = x^3 - 2x - 5 = 0$ by Regula falsi method correct to three decimal places. (5Marks)

b) Find the root of the equation $cosx = xe^x$by Regula falsi method correct to four decimal places. (5Marks)

c) Fit a straight line $y = ax + b$ for the following data by the method of least square (5Marks)

x	1	3	4	6	8	9	11	14
y	1	2	4	4	5	7	8	9

OR

2. **a)** Fit a second degree parabola $y = ax^2 + bx + c$ in the least square sense for the following data (5Marks)

x	1.0	1.5	2.0	2.5	3.0	3.5	4.0
y	1.1	1.3	1.6	2.0	2.7	3.4	4.1

b) Find the correlation coefficient between x and y of the following data (5Marks)

x	78	89	97	69	59	79	68	57
y	125	137	156	112	107	138	123	108

c) The two regression equations of the variables x and y are $x = 19.13 - 0.87y\ and\ y = 11.64 - 0.50x$.Find mean value of x and y and also coefficient of correlation between x and y. (5Marks)

P.T.O

PRINCIPAL
SIET., TUMAKURU.

PART-II

3. a) From the following table, estimate the number of students who obtained marks between 40 and 45. (5 Marks)

Marks	30-40	40-50	50-60	60-70	70-80
No. of students	31	42	51	35	31

b) The area A of a circle of diameter D is given for the following values. (5 Marks)

D	80	85	90	95	100
A	5026	5674	6362	7088	7854

Calculate the area of circle of diameter 105.

c) Using Newton's divided difference formula evaluate $f(8)$ *and* $f(15)$ from the table (5 Marks)

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

OR

4. a) Determine $f(x)$ as a polynomial in x by using Lagrange's formula and find $f(3)$ for the following data. (5 Marks)

x	0	1	2	5
$f(x)$	2	3	12	147

b) Apply Lagrange's interpolation formula inversely to obtain a root of the equation $f(x) = 0$ *given that*
$f(30) = -30, f(34) = -13, f(38) = 3, f(42) = 18$ (5 Marks)

c) Find the approximate value of $\int_0^{\frac{\pi}{2}} \sqrt{\cos\theta}\, d\theta$ by using Simpson's $\frac{1}{3}$ rule by dividing $\left[0,\frac{\pi}{2}\right]$ into 6 equal parts. (5 Ma

PART-II

3. a) From the following table, estimate the number of students who obtained marks between 40 and 45. (5 Marks)

Marks	30-40	40-50	50-60	60-70	70-80
No. of students	31	42	51	35	31

b) The area A of a circle of diameter D is given for the following values. (5 Marks)

D	80	85	90	95	100
A	5026	5674	6362	7088	7854

Calculate the area of circle of diameter 105.

c) Using Newton's divided difference formula evaluate $f(8)$ *and* $f(15)$ from the table (5 Marks)

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

OR

4. a) Determine $f(x)$ as a polynomial in x by using Lagrange's formula and find $f(3)$ for the following data. (5 Marks)

x	0	1	2	5
$f(x)$	2	3	12	147

b) Apply Lagrange's interpolation formula inversely to obtain a root of the equation $f(x) = 0$ *given that*
$f(30) = -30, f(34) = -13, f(38) = 3, f(42) = 18$ (5 Marks)

c) Find the approximate value of $\int_0^{\frac{\pi}{2}} \sqrt{\cos\theta}\, d\theta$ by using Simpson's $\frac{1}{3}$ rule by dividing $\left[0,\frac{\pi}{2}\right]$ into 6 equal parts. (5 Marks)

Sub: Engg. Mathematics-III

III Internal Scheme of Evaluation.

Sub code: 17MAT31

---

1 ⓐ. $\Delta y = 42 \quad \Delta^2 y = 9 \quad \Delta^3 y = -25, \quad \Delta^4 y = 37$

$$r = \frac{x - x_0}{h} = \frac{45-40}{10} = 0.5$$

$$y = y_0 + r\Delta y_0 + \frac{r(r-1)}{2!}\Delta^2 y_0 + \frac{r(r-1)(r-2)}{3!}\Delta^3 y_0 + \cdots$$

$$\boxed{y = 47.87 \approx 48}$$

ⓑ. $y = 5026, \quad \nabla y = 648, \quad \nabla^2 y = 40, \quad \nabla^3 y = -2, \quad \nabla^4 y = 4.$

$$r = \frac{x - x_n}{h} = \frac{105-100}{5} = \frac{5}{5} = 1$$

$$y = y_n + r\nabla y_n + \frac{r(r+1)}{2!}\nabla^2 y_n + \frac{r(r+1)(r+2)}{3!}\nabla^3 y_n + \cdots$$

$$\boxed{y = 8666}$$

c.

x	y	1DD	2DD	3DD	4D.D
4	48				
		52			
5	100		15		
		97		1	0
7	294		21		
		202		1	
10	900		27		0.
		310		1	
11	1210		33		
		409			
13	2028				

$$y = f(x_0) + \cancel{x}(x-x_0) f(x_0,x_1) + (x-x_0)(x-x_1) f(x_0,x_1,x_2) + \cdots$$

$$= 48 + (8-4)(52) + (8-4)(8-5)(15) + (8-4)(8-5)(8-7)(1)$$

$$\boxed{y_8 = 448}$$

$$\boxed{y_5 = 3150}$$

2ⓐ (i) $\int \vec{F}\cdot d\vec{r} = \int 3x^2\,dx + (2xz - y)\,dy + z\,dz$

PRINCIPAL
SIET., TUMAKURU

$x = 2t, \; y = t, \; z = 3t \qquad t = 0, 1.$

$$= \int_0^1 (36t^2 + 8t)\,dt = \left(36\frac{t^3}{3} + 8\frac{t^2}{2}\right)\Big|_0^1 = \underline{\underline{16}}$$

2 ⓐ (ii). workdone $= \int_t \vec{F} \cdot d\vec{r}$

$$= \int_0^2 \left(3t^2 - \frac{t^3}{8} + \frac{51}{64} t^5\right) dt.$$

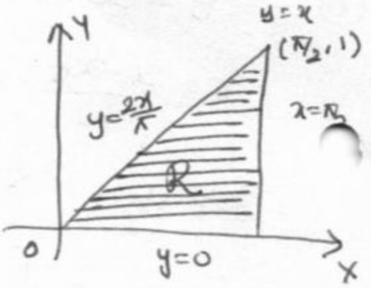
$$= 16.$$

2 ⓑ. Green's Thm $\int_c P dx + Q dy = \iint \left(\frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y}\right) dx\, dy$

$$\text{RHS} = \iint \left(\frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y}\right) dx\, dy$$

$$= \iint (-\sin x - 1) dx\, dy \quad = - \iint (1 + \sin x) dx\, dy$$

$$= - \int_0^{\pi/2} \int_0^{2x/\pi} (1 + \sin x)\, dy\, dx \quad = - \left(\frac{\pi}{4} + \frac{2}{\pi}\right).$$



ⓒ. $\vec{F} \cdot d\vec{r} = (3xy dx - y^2 dy)$

$\int_c \vec{F} \cdot d\vec{r} = \int 3xy\, dx - y^2 dy.$ $\quad y = 2x^2$, $dy = 4x\, dx$ $\quad x \to (0, 1)$

$$= \int_0^1 (6x^3 - 16x^5) dx = \frac{9-16}{6} = \frac{-7}{6}.$$

3 ⓐ. $x_0 = 0, \; x_1 = 1, \; x_2 = 2, \; x_3 = 5$
$y_0 = 2, \; y_1 = 3, \; y_2 = 12, \; y_3 = 147$

$$y = \frac{(x - x_1)(x - x_2)(x - x_3)}{(x_0 - x_1)(x_0 - x_2)(x_0 - x_3)} y_0 + \frac{(x - x_0)(x - x_2)(x - x_3)}{(x_1 - x_0)(x_1 - x_2)(x_1 - x_3)} y_1 + \cdots\cdots$$

$$= x^3 + x^2 - x + 2$$

$$\boxed{y(3) = 35}$$

ⓑ. $x_0 = 30, \; x_1 = 34, \; x_2 = 38, \; x_3 = 42$
$y_0 = -30, \; y_1 = -13, \; y_2 = 3, \; y_3 = 18$

$$\boxed{x = 37.23}$$

3 ⓒ. $h = \frac{b-a}{n} = \frac{\pi/2 - 0}{6} = \frac{\pi}{12}$ or 15°

$$I = \int_0^{\pi/2} \sqrt{\cos\theta}\, d\theta.$$

$\theta°$	0	15°	30°	45°	60°	75°	90°
$\sqrt{\cos\theta}$	1	0.9828	0.9306	0.8409	0.7071	0.5087	0.

$$I = \frac{h}{3}\left[(y_0+y_6)+4(y_1+y_3+y_5)+2(y_2+y_4)\right]$$

$$\boxed{I = 1.1873} \qquad \pi = \frac{22}{7}$$

4 ⓐ. Stokes thm $\oint_C \vec{F}\cdot d\vec{r} = \iint_S (\nabla\times\vec{F})\cdot\hat{n}\, ds$

$$\nabla\times\vec{F} = \begin{vmatrix} i & j & k \\ \partial/\partial x & \partial/\partial y & \partial/\partial z \\ yz & zx & xy \end{vmatrix} = 0.$$

$$\oint_C \vec{F}\cdot d\vec{r} = 0.$$

ⓑ. $$\nabla\times\vec{F} = \begin{vmatrix} i & j & k \\ \partial/\partial x & \partial/\partial y & \partial/\partial z \\ \sin z & -\cos x & \sin y \end{vmatrix} = \cos y\, i + \cos z\, j + \sin x\, k.$$

$$\oint_C \vec{F}\cdot d\vec{r} = \iint (\nabla\times\vec{F})\cdot\hat{n}\, ds = \iint \sin x\, ds = \int_{y=0}^{1}\int_{x=0}^{\pi} \sin x\, dx\, dy$$

$$= \underline{\underline{2}}$$

ⓒ. $$\oint_C \vec{F}\cdot d\vec{r} = \oint_C (2x-y)\,dx.$$

$$\oint_C \vec{F}\cdot d\vec{r} = -\int_0^{2\pi} (2\sin t\cos t - \sin^2 t)\,dt = \pi. \text{ —①}$$

$$\nabla\times\vec{F} = \begin{vmatrix} i & j & k \\ \partial/\partial x & \partial/\partial y & \partial/\partial z \\ 2x-y & -yz^2 & -y^2z \end{vmatrix} = k.$$

from ① & ② thm verified.

$$\iint (\nabla\times\vec{F})\cdot\hat{n}\, ds = \iint_S k\cdot\hat{k}\, ds = \iint_S ds = S = \pi \text{ —②}$$

(surface, sphere)

PRINCIPAL
SIET., TUMAKURU

18-19 - II Sem

SHRIDEI INSTITUTE OF ENGINEERING AND TECHNOLOGY

An ISO 9001:2015 Certified Institution

II Semester: I-Internal assessment test **Date: 15-04-19**
Sub: Engineering Chemistry (18CHE22)
Time: 90minutes **Section: A** **Max Marks: 30**

***NOTE*: Answer any *TWO FULL* questions.**

1. (a) Derive Nernst equation for single electrode potential
(b) Explain the construction, working and advantages of Calomel electrode.
(c) What are electrolytic concentration cells? Explain with an example **(5+5+5)**

(OR)

2. (a) Explain the construction, working and uses of Ni-MH battery.
(b) Explain the construction, working and uses of Li-CoO_2 battery.
(c) Calculate the emf of the concentration cell Cu(s) /Cu SO_4 (0.01M) // Cu SO_4 (1M) / Cu(s) at 298K. Write the cell reactions. **(5+5+5)**

3. (a) Explain the electrochemical theory of corrosion.
(b) What is cathodic protection? Explain the Sacrificial anodic protection method of corrosion.
(c) Explain the anodizing process of aluminium **(5+5+5)**

(OR)

4. (a) What is metal finishing? Mention the technological importance of metal finishing.
(b) Explain the electro less plating process of Copper.
(c) What is electro less plating? Give the differences between electro plating and electro less Plating. **(5+5+5)**

PRINCIPAL
SIET., TUMAKURU.

18-19

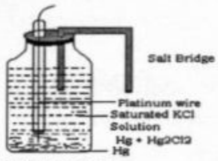
SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY

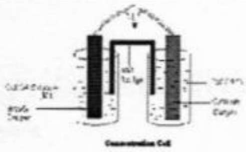
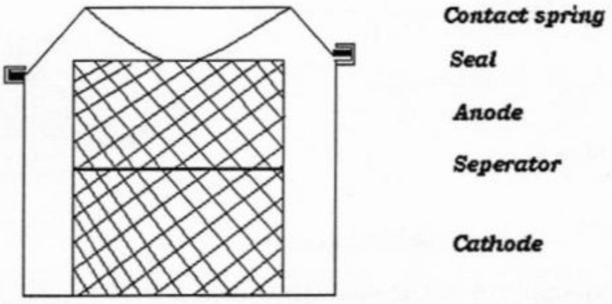
An ISO 9001:2015 Certified Institution

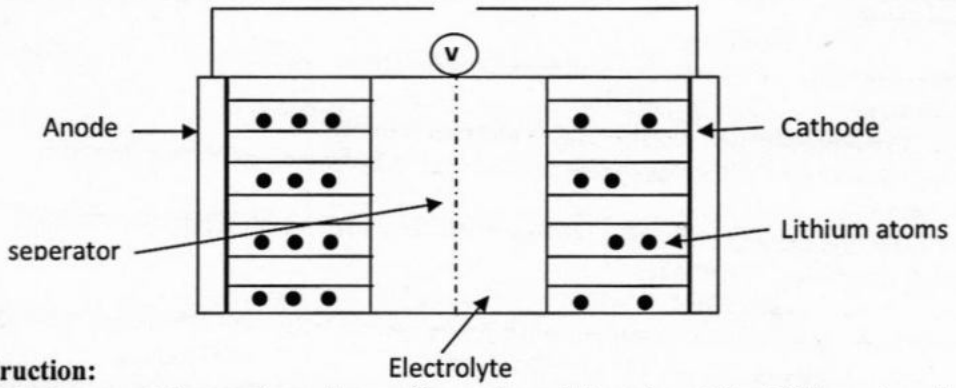
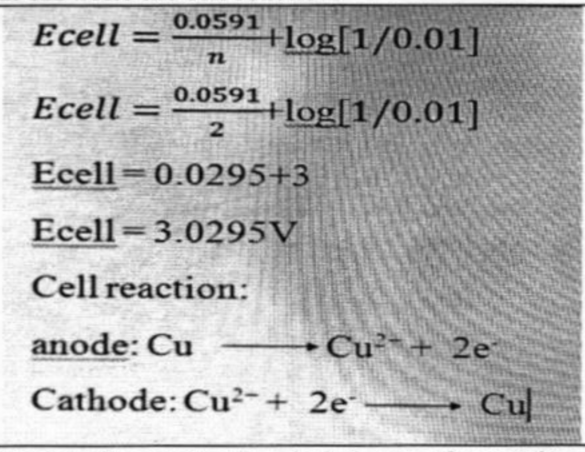
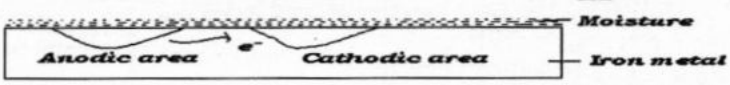
II semester: I-Internal assessment test

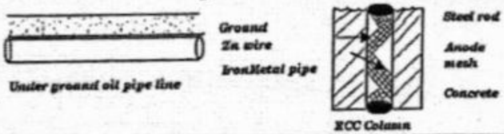
Scheme of valuation

Sub: Engineering Chemistry (18CHE12) Date: 15-04-2019

Q.no	Scheme	Marks
1. (a)	**Derive Nernst equation for single electrode potential**	**5Marks**
	The maximum work available from a reversible chemical process is equal to the maximum amount of electrical energy that can be obtained; it shows decrease in free energy. $Wmax = - \Delta G$	1mark
	There fore $\Delta G = - nFE$ $\boxed{E = \frac{\Delta G}{-nF}}$ $\boxed{E^o = \frac{\Delta G^0}{-nF}}$	1mark
	Consider the following reversible electrode reaction, $\boxed{M^{n+} + ne^- \rightleftharpoons M}$ For the above reaction the equilibrium constant (Kc) can be written as, $Kc = \frac{[M]}{[M^{n+}]}$	1mark
	Kc and ΔG are related according to the following thermodynamic equation $\boxed{\Delta G = \Delta G^0 + RT \ln Kc}$ ----------------→1 Dividing the equation 1 by – nF and Substituting the value of Kc, $\frac{\Delta G}{-nF} = \frac{\Delta G^o}{-nF} + \frac{RT\ ln}{-nF}[M]/[M^{n+}]$ -------------→2 Substituing the values of $\frac{\Delta G}{-nF}$ and $\frac{\Delta G^o}{-nF}$ in equation 3, Equation 3 => $E = E^o + \frac{RT\ ln[M^{n+}]}{nF}$ When [M] = 1	1mark
	$E = E^o + \frac{2.303RT}{nF}\log_{10}[M^{n+}]$ ⟶ Nernst equation	
(b)	**Explain the construction, working and advantages of Calomel electrode.**	**5Marks**
	 Salt Bridge Platinum wire Saturated KCl Solution Hg + Hg2Cl2 HgCalomel electrode Fig and Labeling Explanation Reactions	1mark 3mark 1mark
	- Calomel electrode consisting of a glass container at the bottom of which mercury is placed and above which a layer of mercury and mercurous chloride (called calomel) is placed • 3/4th of bottle is filled with saturated KCl solution. • Calomel Electrode potential depends on the concentration of chloride ions. • The calomel electrode acts as both anode and cathode depending upon the other electrode used. • The platinum wire is used for electrical connections. Salt bridge is used to couple with other half cell. • The calomel electrode can be represented as $Hg (l) / Hg_2Cl_2 (S) / Cl^-$ • When it acts as anode the electrode reactions is, • $2Hg + 2Cl^- \longrightarrow Hg_2Cl_2 + 2e^-$ • When it acts as cathode the electrode reaction is • $Hg_2Cl_2 + 2e^- \longrightarrow 2Hg + 2Cl^-$ •	
(c)	**What are electrolytic concentration cells? Explain with an example**	**5Marks**
		1mark

	 Fig and Labeling Explanation Reactions Formula - These are the galvanic cells consisting of same metal electrodes as anode and cathodes dipped in same electrolytic solution but are different in the electrolyte concentration. - **Ex:** Consider the following concentration cell constructed by dipping two copper electrodes in Cuso$_4$ solutions of concentration M_2 molar and M_1 molar, where $M_2M > M_1M$. - The two half-cell are internally connected by a salt bridge and externally connected by a metallic wire through voltmeter - The electrode, which is dipped in less electrolytic concentration solution (M_1M) act as anode and undergoes oxidation. The electrode, which is dipped in more electrolytic concentration solution (M_2M) act as cathode and undergoes reduction. - At anode : $Cu (S) \longrightarrow Cu^{2+} (M_1) + 2e^-$ - At cathode : $Cu^{2+} (M_2) + 2e^- \longrightarrow Cu (S)$ - Net Cell Reaction: $Cu^{2+} (M_2) \longrightarrow Cu^{2+} (M_1)$ - E of cell = E cathode – E anode. - $E\ cell = (E^\circ + \frac{0.0591}{n} \log [M2]) - (E^\circ + \frac{0.0591}{n} \log [M1])$ $\boxed{E_{cell} = \frac{0.0591}{n} \log \frac{[M2]}{[M1]}}$	1mark 1mark 1mark 1mark
2.(a)	Explain the construction, working and uses of Ni-MH battery?	**5Marks**
	 ***Nickel - Metal hydride Battery*** Nickel Metal hydride battery is made up of anode containing metal hydride such as ZrH_2, VH_2 and TiH_2 with hydrogen storage metal alloy such as La Ni_5 or TiNi.Cathode consisting of nickel oxy hydroxide both the compartments are separated by polypropyl. KOH used as electrolyte. Cell reactions are as follows. At anode : $MH + OH^- \longrightarrow M + H_2O + e^-$ At cathode : $NiO (OH) + e^- + H_2O \longrightarrow Ni (OH)2 + OH^-$ NCR : $MH + NiO (OH) \longrightarrow M + Ni (OH)2 + M$ Applications: Used in electric vehicles, laptops, cellular phones etc., Advantages: i) Resistance to chemical oxidation ii) High energy storage capacity.	1mark 1mark 1mark 1mark 1mark
2. (b)	Explain the construction, working and uses of Li-CoO2 battery?	**5Marks**
		1mark

	 V Anode Cathode seperator Lithium atoms Electrolyte **Construction:** $LiCoO_2$ battery contains anode made up of layered graphite and contains Lithium atoms in between the layers called intercalation. The cathode of the battery is made of layered cobalt oxide and contains Lithium atoms in between the layers. The cathode and anode are separated by polymeric separator. Lithium salt such as $LiPF_6$ is used as electrolyte. **Working:** During discharging the lithium atoms undergoes oxidation and moves toward cathode as lithium ions. At cathode the reduction of Co^{4+} ions into Co^{3+} ions takes place and lithium ions enters into Cobalt oxide layers as lithium atoms. At anode: $xLiC \rightleftharpoons C + xLi^+ + xe^-$ At cathode: $CoO_2 + xLi^+ + xe^- \rightleftharpoons LiCoO_2$ Net cell reaction: $xLiC + CoO_2 \rightleftharpoons C + LiCoO_2$ **Advantages:** • They have high power to weight ratio. • They have high energy efficiency. • Performance of the battery is good at even high temperature. • They have high cycle life. • These have longer charge retention than other batteries.	2mark 1mark 1mark
(C)	**Calculate the EMF of the concentration cell Cu(s) / $CuSO_4$(0.01M) // $CuSO_4$(1M) / Cu(s) at 298K write the cell reaction.**	
	 $Ecell = \frac{0.0591}{n} + \log[1/0.01]$ $Ecell = \frac{0.0591}{2} + \log[1/0.01]$ Ecell = 0.0295+3 Ecell = 3.0295V Cell reaction: anode: $Cu \longrightarrow Cu^{2-} + 2e^-$ Cathode: $Cu^{2-} + 2e^- \longrightarrow Cu$	5marks 1 1 1 1
3.(a)	**Explain the electrochemical theory of corrosion**	5marks
	According to electrochemical theory, corrosion of metals occurs due to the following changes, when they are exposed to the environment  Air Moisture e^- Anodic area Cathodic area Iron metal 1) A large number of minute galvanic cells are formed which acts as anodic and cathodic areas. 2) At anodic area the metal undergoes oxidation and electrons are liberated which migrates towards Cathodic region.	1 1 1 1

	$M \longrightarrow M^{n+} + ne^-$ Metal Metal ions Ex: when iron is exposed to the environment it undergoes oxidation as $Fe \longrightarrow Fe^{2+} + 2e-$ 3) At Cathodic area different reduction reactions takes place as follows a) In acidic and deaerated medium: Hydrogen ions are reduced to hydrogen gas by reacting with electrons. $2H^+ + 2e^- \longrightarrow H_2$ b) In alkaline and deaerated medium: Moisture of the environment reacts with electrons producing hydroxyl ions and Hydrogen gas at cathode. $2H_2O + 2e^- \longrightarrow 2OH^- + H_2$ c) In neutral and aerated medium: Moisture of the environment reacts with electrons and Oxygen and produces hydroxyl ions at cathode. $2H_2O + O_2 + 4e^-$ $4OH^- \longrightarrow$ 4) Formation of corrosion product: The hydroxyl ions formed at Cathodic area reacts with metal ions (M^{n+} ions) formed at Anodic area and forms metal hydroxides which further reacts with moisture and oxygen forming an insoluble Metal oxide corrosion product. In the case of iron OH- reacts with Fe^{2+} ions, O_2 and moisture producing an insoluble hydrated ferric oxide known as brown rust. $2Fe^{++} + 4OH^- \longrightarrow 2Fe(OH)_2$ $2Fe(OH)_2 + O_2 + nH_2O \longrightarrow Fe_2O_3 . nH_2O$ (rust)	1
(b)	What is cathodic protection ? Explain sacrificial anodic protection.	5
	Cathodic protection is a method in which the metal to be protected from corrosion is made as cathode by attaching more active anodic metal to it. The following methods are used to protect the metal from corrosion by Cathodic protection. a) Sacrificial anodic protection method. In this method the more active metals like Zn, Mg, and Al etc are used as anodic metals and attached to the base metal(metal tobe protected from corrosion). The anodic metals being more reactive undergoes corrosion but base metal remains unaffected .The sacrificial anodes have to be replaced from time to time after complete corrosion. The method is used for protecting buried pipeline, ship hulls, industrial water tank steel rods in RCC columns. Several hundred kilometers long zinc wire is buried along oil pipe line in Alaska is an example for sacrificial anodic protection method  Ground Zn wire IronMetal pipe Under ground oil pipe line Steel rod Anode mesh Concrete RCC Column	1 1 1 1 1
(C).	**Explain the anodizing process of aluminium**	5
	➢ Pretreatment: The article be anodized is degreased and followed by electro polished ➢ Aluminum is connected to positive terminal and made as anode. ➢ Steel or copper is connected to negative terminal and made as cathode ➢ The anode and cathode are dipped in electrolyte solution containing 5-10% chromic acid. ➢ The temperature of the bath is maintained at 35^0c ➢ Voltage is applied between 0-50V. ➢ First ten minutes potential is increased to 0-40V. ➢ After 20 minutes voltage is applied from 40-50V ➢ The voltage is kept constant at 50 V for five minutes. ➢ During this period, 2-8 micrometer thick aluminum oxide layer is obtained. ➢ Finally the object is treated with Ni or Cobalt acetate fallowed by boiling water treatment to improve corrosion resistance. ➢ For higher thickness 10% H_2SO_4 is used as electrolyte. At anode: $2Al(s) + 3H_2O(l) \longrightarrow Al_2O_3(s) + 6H^+ + 6e^-$ At cathode: $6H^+ + 6e^- \longrightarrow 3H_2(g)$ Over all reaction: $2Al(s) + 3H_2O(l) \longrightarrow Al_2O_3(s) + 3H_2$	1 1 1 1 1
4.(a)	**What is metal finishing? Mention the technological importance of metal finishing**	5
	It is a process of modifying surface properties of metals by deposition of a layer of another metal or polymer on its surface, by the formation of an oxide film. **Technological importance of metal finishing.** Imparting the metal surface to higher corrosion resistance.	2 1

Imparting improved wear resistance.
Providing electrical and thermal conducting surface. 1
Imparting thermal resistance and hardness. 1
Providing optical and thermal reflectivity.
In the manufacture of electrical and electronic components such as PCB's, capacitors, etc

(b) **Explain the electroless plating of copper** 5

Metal ions + Reducing agent → Metal + Oxidized product 1
Plating bath Solution: $CuSO_4.5H_2O$ (12 g per dm^3), NaOH (15 g per/L
Rochelle salt (14 g per dm^3), EDTA (15 g per dm^3) Reducing Agent
: Formaldehyde (8 g per dm^3) 1
Complexing agent : EDTA Solution.
p^H : 11 - 12
Temperature : 25 ^{0}c 1
At Anode : $2HCHO + 4OH^- \rightarrow 2HCOO^- + 2H_2O + H_2 + 2e^-$ 1
At Cathode : $Cu^{2+} + 2e^- \rightarrow Cu$
Overall reactions : $4OH^- + Cu^{2+} + 2HCHO \rightarrow Cu + 2HCOO^- + 2H_2O + H_2$ 1

(c) **What is electroless plating? Give the differences between Electroless plating and Electroplating.** 5

It is process of deposition of a metal from its salt solution on a catalytically active surface of a substrate by using suitable reducing agent and without using electrical energy. 1

Electroplating	Electroless plating	
1. require electrical power source and accessories.	1. require electrical power source and accessories.	1
2. Deposition can't be made on non-conductors such as plastics, ceramics etc.	2. Deposition can be made on non-conductors such as plastics, ceramics etc.	1 1
3. requires Levelers	3. Does not require Levelers	
4. Plating baths don't have excellent throwing power.	4. Plating baths have excellent throwing power.	1

PRINCIPAL
SIET., TUMAKURU.

SHRIDEI INSTITUTE OF ENGINEERING AND TECHNOLOGY

II Semester: II-Internal assessment test **Date: 16-05-19**

Sub: Engineering Chemistry (18CHE22)

Time: 90minutes **Section: A** **Max Marks: 30**

***NOTE*: Answer any *TWO FULL* questions.**

1. (a) Explain the determination of calorific value of solid fuel using Bomb calorimeter
(b) What is Knocking of petrol engine? Explain the Mechanism of Knocking
(c) Explain the construction, working and uses of Methanol – Oxygen fuel cell **(5+5+5)**

(OR)

2. (a) Explain the construction, working and uses of Solid oxide fuel cell (SOFC)
(b) Explain the construction and working of photovoltaic cell.
(c) Calculate GCV and NCV of a fuel from the following data. Mass of fuel =0.75g, W_1= 2.5 Kg, W_2 = 0.65 Kg, $t_2 = 27.2^0C$, $t_1 = 24.0^0C$, % H_2 = 5 and S = 4.187 J/Kg/^{0}C. Latent heat of steam =2457 J/Kg/^{0}C **(5+5+5)**

3. (a) Explain the Sources, effects and control of Carbon monoxide air pollution
(b) Explain the Sources, effects and control of Particulated matter air pollution
(c) Explain the Sources, effects and control of Lead air pollution **(5+5+5)**

(OR)

4. (a) Explain the Sources, effects and control of Oxides of Nitrogen.
(b) Explain the Sources, effects and control of Mercury air pollution
(c) Explain the Sources, effects and control of ozone air pollution and write a note on ozone depletion **(5+5+5)**

SHRIDEI INSTITUTE OF ENGINEERING AND TECHNOLOGY

II Semester: II-Internal assessment test **Date: 16-05-19**

Sub: Engineering Chemistry (18CHE22)

Time: 90minutes **Section: A** **Max Marks: 30**

***NOTE*: Answer any *TWO FULL* questions.**

1. (a) Explain the determination of calorific value of solid fuel using Bomb calorimeter
(b) What is Knocking of petrol engine? Explain the Mechanism of Knocking
(c) Explain the construction, working and uses of Methanol – Oxygen fuel cell **(5+5+5)**

(OR)

2. (a) Explain the construction, working and uses of Solid oxide fuel cell (SOFC)
(b) Explain the construction and working of photovoltaic cell.
(c) Calculate GCV and NCV of a fuel from the following data. Mass of fuel =0.75g, W_1= 2.5 Kg, W_2 = 0.65 Kg, $t_2 = 27.2^0C$, $t_1 = 24.0^0C$, % H_2 = 5 and S = 4.187 J/Kg/^{0}C. Latent heat of steam =2457 J/Kg/^{0}C **(5+5+5)**

3. (a) Explain the Sources, effects and control of Carbon monoxide air pollution
(b) Explain the Sources, effects and control of Particulated matter air pollution
(c) Explain the Sources, effects and control of Lead air pollution **(5+5+5)**

(OR)

4. (a) Explain the Sources, effects and control of Oxides of Nitrogen.
(b) Explain the Sources, effects and control of Mercury air pollution
(c) Explain the Sources, effects and control of ozone air pollution and write a note on ozone depletion **(5+5+5)**

PRINCIPAL
SIET. TUMAKURU

18-19

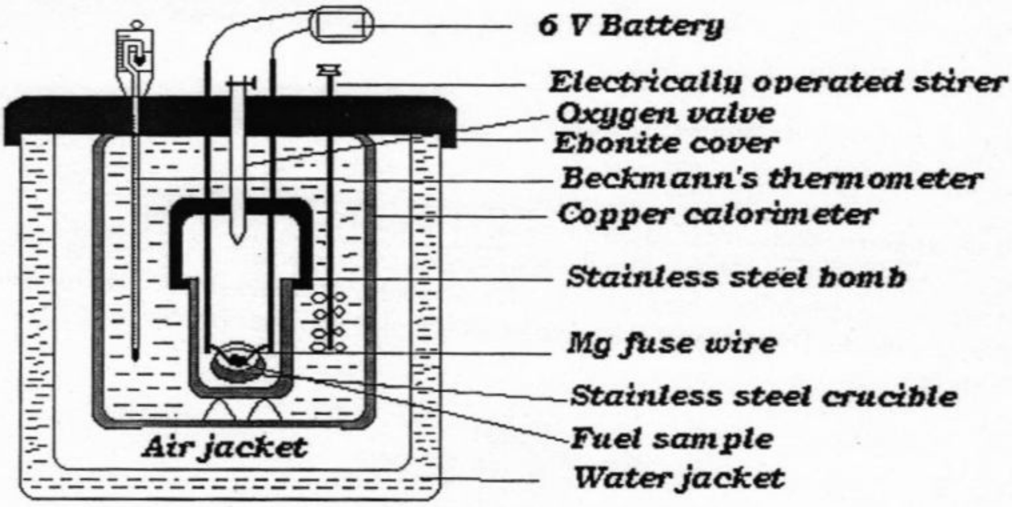
SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY

An ISO 9001:2015 Certified Institution

II semester: II-Internal assessment test

Scheme of valuation

Sub: Engineering Chemistry (18CHE22) Date: 16-05-2019

Q.no	Scheme	Mark
1. (a)	**Explain the determination of Calorific value of solid fuel using Bomb calorimeter**	**5Mar**
	 6 V Battery Electrically operated stirer Oxygen valve Ebonite cover Beckmann's thermometer Copper calorimeter Stainless steel bomb Mg fuse wire Stainless steel crucible Fuel sample Water jacket Air jacket **Bomb Calorimeter** A small quantity of a fuel is weighed accurately (M Kg) and is placed in the Bomb. The bomb is placed in known amount water taken in a copper calorimeter. The initial temp of water is noted as a $t_1{}^0C$ with the help of thermometer. Oxygen gas is pumped under pressure 20 to 25 atm through the O_2 valve provided. The fuel is ignited by passing electric current through the wires provided. As the fuel undergoes combustion and liberates heat, which is absorbed by surrounding water. The water is stirred continuously to distribute the heat uniformly and the final temp attained by water is noted $t_2{}^0C$. & gross calorific value of the fuel is calculated as follows:- *Calculation:* Mass of the fuel = M Kg. Initial temp of the water = $t_1{}^0C$ Final temp of the water = $t_2{}^0C$ Change in temp = $\Delta t = (t_2 - t_1)^0$ C Specific heat of water = S Water equivalent of calorimeter = W Kg. $GCV = \frac{W \times S \times \Delta t}{M}$ J/Kg or $GCV = \frac{(W+w) \times S \times \Delta t}{M}$ J /Kg NCV $= GCV - 0.09 \times \%H_2 \times 587$ cal/g	1mark 1mark 1mark 1mark 1mark
(b)	**What is knocking of petrol engine? Explain the mechanism of knocking.**	**5Mar**
	The explosive combustion of petrol and air mixture produces shock waves in I.C. engine, which hit the walls of the cylinder and piston producing a rattling sound is known as knocking. **Mechanism of Knocking** Beyond a particular compression ratio the petrol mixture suddenly burns into flame. The rate of flame propagation increases from 20 to 25m/s to 2500m/s, which propagates very fast, producing a	1mark 3mark 1mark

rattling sound. The activated peroxide molecules decomposes to give number of gases products which produces thermal shock waves which hit the walls of the cylinder and piston causing a rattling sound which is known as knocking.

The reactions of normal and explosive combustion of fuel can be given as follows taking ethane as an example

$C_2H_6 + 3\frac{1}{2} O_2 \rightarrow 2CO_2 + 3H_2O$ (Normal combustion reaction)

$C_2H_6 + O_2 \rightarrow CH_3\text{-}O\text{-}O\text{-}CH_3$ (Explosive combustion reaction)

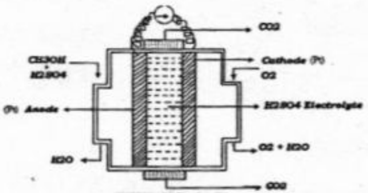
$CH_3\text{-}O\text{-}O\text{-}CH_3 \rightarrow CH_3\text{-}CHO + H_2O$

$CH_3\text{-}CHO + 1\frac{1}{2} O_2 \rightarrow HCHO + CO_2 + H_2O$

$HCHO + O_2 \rightarrow CO_2 + H_2O$

(c) Explain the construction, working and uses of Methanol oxygen fuel cell — **5Marks**

It consists of two electrodes made up of platinum as anode and cathode and in between the electrodes H_2SO_4 is placed as a electrolyte. Methanol and H_2SO_4 is supplied at the anode and pure oxygen gas is supplied at the cathode. The methanol is oxidized to CO_2 & H_2O with the liberation of 1.20v of electrical energy. 1mark 1mark



CH3OH - O2 Fuel cell

1mark 1mark

The cell reactions are as follows. 1mark

At anode : $CH_3OH + H_2O \longrightarrow CO_2 + 6H^+ + 6e^-$

At cathode : $\frac{3}{2} O_2 + 6H^+ + 6e^- \longrightarrow 3H_2O$

NCR : $CH_3OH + \frac{3}{2} O_2 \longrightarrow CO_2 + 2H_2O$

Applications:

1) Used in Military applications.

Used for large scale power production stations.

2.(a) Explain the construction, working and uses of solid oxide fuel cells — **5Marks**

These contains ZrO_2, Y_2O_3 are solid electrolytes. Cathode is made up of porous strontium doped with $LaMnO_3$ or In_2O_3 and SnO_2. Anode is made up of cobalt, nickel, or ZrO2. Operating temperature is 1000°C.

Uses: These cells are used in KW power plants

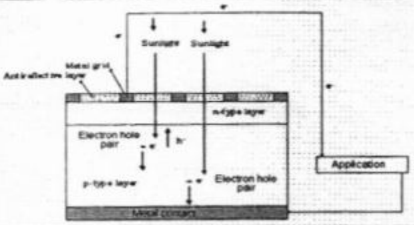
(b) Explain the construction, working of photo voltaic cell. — **5Marks**

A typical silicon photovoltaic cell is composed of a thin layer of phosphorus doped. (n-type) semiconductor on the top and a thick layer boron doped p-type semiconductor at the bottom. Hence a p-n junction is formed. 1mark

A metallic grid forms one of the electrical current contacts of the diode and allows light to fall on the 2mark

		1mark
(c)	**Explain the sources and ill effects and control of lead pollution.**	**5mark**
	Lead-based paint and lead-contaminated dust in older buildings are common sources of lead poisoning in children. Other sources include contaminated air, water and soil. Adults who work with batteries, do home renovations or work in auto repair shops also might be exposed to lead. Signs and symptoms of lead poisoning in children include: High blood pressure, Joint and muscle pain, Irritability, Loss of appetite Weight loss, Sluggishness and fatigue, Abdominal pain, Vomiting. Constipation, Hearing loss, Seizures. • Wash hands and toys. To help reduce hand-to-mouth transfer of contaminated dust or soil, wash your children's hands after outdoor play, before eating and at bedtime. Wash their toys regularly. • Controlling: • Clean dusty surfaces: Cleaning the floors. • Run cold water. • Prevent children from playing on soil. Eat a healthy diet.	1mark 1mark 1mark 1mark 1mark
4.a)	**Explain the sources and ill effects and control of lead pollution.**	**5mark**
	Nitric oxide, nitrogen dioxide and nitrous oxide are the three main oxides of nitrogen found in the atmosphere **Sources:** The sources for the oxides of nitrogen are: $4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$ $N_2 + O_2 \rightarrow 2NO$ $2NO + O_2 \rightarrow 2NO_2$ oxide. $N_2 + O_2 \rightarrow 2NO$ Nitric oxide escapes through the exhaust. It gets cooled rapidly and combines with oxygen in the air to give nitrogen dioxide. $2NO + O_2 \rightarrow 2NO_2$ **Ill effects:** Pollution due to oxides of nitrogen affects human and plant life: The oxides of nitrogen combine with moisture in the atmosphere to form nitrous and nitric acid. This leads to increase in the acidity of rain water Formation of photochemical smog: oxides of nitrogen combine with hydrocarbons present in the atmosphere forming peroxyacyl nitrate. Peoxyacyl nitrate causes injury to plants and in human beings it causes fatigue and infection of the lungs Peroxyacyl nitrate formation leads to smog (fog + smoke). **Control:** Using catalytic converter in automobiles. Catalytic converters use Pt/ Rh catalyst. in the presence of the catalysts, the oxides of nitrogen are converted to nitrogen and oxygen . $2NO_x \rightarrow N_2 + x\,O_2$	1mark 1mark 1mark 1mark 1mark
(b)	**Explain the sources and ill effects and control of Hg pollution.**	**5mark**
	Natural sources of mercury include volcanic eruptions and emissions from the ocean. Anthropogenic (human-caused) emissions include mercury that is released from fuels or raw materials, or from uses in products or industrial processes. Mercury may have toxic effects on the nervous, digestive and immune systems, and on lungs, kidneys, skin and eyes. Some of the health effects exposure to mercury may cause include: irritation to the eyes, skin, and stomach; cough, chest pain, or difficulty breathing, insomnia, irritability, indecision, headache, weakness or exhaustion, and weight loss. Minamata Disease is a poisoning disease that nervous system, mainly central nervous system, is damaged by methylmercury. Avoid buying products that contain mercury except for fluorescent light bulbs. Fluorescent bulbs use less electricity than incandescent bulbs. Keep mercury-containing items out of the trash.	1mark 1mark 1mark 1mark 1mark

(c)	**Explain the sources and ill effects and control of Ozone layer depletion.**	**5mark**
	Ozone layer depletion is the gradual thinning of the earth's ozone layer in the upper atmosphere caused due to the release of chemical compounds containing gaseous bromine or chlorine from industries or other human activities." Sources: Chlorofluorocarbons Unregulated Rocket Launches Nitrogenous Compounds Natural Causes Ill effects: it has, Effects on Human Health and Animal Health Effects on Aquatic Ecosystems Effects on Air Quality Effects on Materials Controling: Avoid Using ODS Reduce the use of ozone depleting substances. E.g. avoid the use of CFCs in refrigerators and air conditioners, replacing the halon based fire extinguishers, etc. Minimise the Use of Vehicles The vehicles emit a large amount of greenhouse gases that lead to global warming as well as ozone depletion. Therefore, the use of vehicles should be minimised as much as possible.	1mark 1mark 1mark 1mark 1mark

	 Sunlight Sunlight Metal grid Anti reflection layer n-type layer Electron hole pair p-type layer Electron hole pair Metal contact Application	1mark
(C)	Calculate GCV and NCV of a fuel from the following data. Mass of fuel=0.75g, W=2.5Kg, w_2=0.65Kg. t_1=24, t_2=27, % H_2=5.	5mark

	GCV $= \frac{(W+w) \times \triangle t \times S}{M}$
	$= \frac{(2.5+0.65) \times 3.2 \times 4.187}{0.75 \times 10^{-3}}$
	GCV = 56273.28 KJ/Kg
	NCV = GCV –0.09 x H x 587 x 4.184
	= 25271.36 – 0.09 x 5 x 587 x 4.187
	NCV = 24165.36 KJ/Kg
		1mark
		1mark
		1mark
		1mark
		1mark

3.(a)	**Explain the sources and ill effects and control of CO air pollution.**	**5Mark**
	CO is found in fumes produced any time you burn fuel in cars or trucks, small engines, stoves, lanterns, grills, fireplaces, gas ranges, or furnaces. CO can build up indoors and poison people and animals who breathe it. The most common symptoms of CO poisoning are headache, dizziness, weakness, upset stomach, vomiting, chest pain, and confusion. CO symptoms are often described as "flu-like." If you breathe in a lot of CO it can make you pass out or kill you. People who are sleeping or drunk can die from CO poisoning before they have symptoms. Limited burning of charcoal indoors. Burning charcoal – red, gray, black, or white – gives off CO. Do not use portable flameless chemical heaters indoors. Check or changing the batteries in CO detector every six months.	1mark 1mark 1mark 1mark 1mark
(b)	**Explain the sources and ill effects and control of perticulate matter pollution.**	**5mark**
	There are numerous natural processes injecting particulate matter into the atmosphere (800-2000 million tonnes each year). Examples are volcanic eruptions, blowing of dust and soil by the wind, spraying of salt and other solid particles by the seas and oceans, etc. The contributions from man-made activities are flyash from power plants, smelters and mining operations, and smoke from incomplete combustion processes. Statistics regarding man-made particulate pollution indicates that fuel combustions from stationary sources (coal, fuel oil, natural gas, wood), industrial processes, and miscellaneous sources (forest fires, structural fires, coal refuse burning and agricultural burning) share almost equally (one-third each) the total particulate emission (200–450 million tonnes per year). In developed countries like USA, the annual particulate emission is about 20×10^6 tonnes, including 5×10^6 tonnes of fine particles (less than 3 μ).	1mark 1mark 1mark 1mark

	semiconductor between the grid lines. An antireflective layer (TiO_2 or silicon nitride) between the grid lines increases the amount of light transmitted. When light radiation falls on the p-n junction, electron – hole pairs are generated by the absorption of the sun radiation. The electrons are moves and collect at the n-type end and the holes moves to p-type end. When these two ends are electrically connected through a conductor, photoelectric current is produced.	1mark

PRINCIPAL
SIET., TUMAKURU

SHRIDEI INSTITUTE OF ENGINEERING AND TECHNOLOGY

II Semester: III-Internal assessment test **Date: 13-06-19**

Sub: Engineering Chemistry (18CHE22)

Time: 90minutes **Section: A** **Max Marks: 30**

***NOTE*: Answer any *TWO FULL* questions.**

1. (a) What is boiler feed water? Write a note on Scales and sludge formation in boiler
(b) Explain the desalination of water by Reverse osmosis method
(c) Explain the determination sulphate content of water by gravimetric method **(5+5+5)**

(OR)

2. (a) Explain the Sources, characteristics & disposal methods of Biomedical waste management
(b) Explain activated sludge method of sewage treatment
(c) In a COD experiment 25 cm^3 of an effluent sample required 29.8 cm^3 0.02 N FAS solution in Blank titration and 12 cm^3 0.02 N FAS solution in sample titration. Calculate COD of the effluent sample. **(5+5+5)**

3. (a) Explain the theory, Instrumentation and applications of Colorimetry
(b) Explain the Synthesis of Nanomaterials by sol gel method
(c) Explain properties and applications of Graphenes **(5+5+5)**

(OR)

4. (a) Explain the theory, Instrumentation and applications of Flame Photometry.
(b) Explain the Synthesis of Nanomaterials by chemical vapour deposition method
(c) Explain the properties and applications of fullerenes. **(5+5+5)**

……

SHRIDEI INSTITUTE OF ENGINEERING AND TECHNOLOGY

II Semester: III-Internal assessment test **Date: 13-06-19**

Sub: Engineering Chemistry (18CHE22)

Time: 90minutes **Section: A** **Max Marks: 30**

***NOTE*: Answer any *TWO FULL* questions.**

1. (a) What is boiler feed water? Write a note on Scales and sludge formation in boiler
(b) Explain the desalination of water by Reverse osmosis method
(c) Explain the determination sulphate content of water by gravimetric method **(5+5+5)**

(OR)

2. (a) Explain the Sources, characteristics & disposal methods of Biomedical waste management
(b) Explain activated sludge method of sewage treatment
(c) In a COD experiment 25 cm^3 of an effluent sample required 29.8 cm^3 0.02 N FAS solution in Blank titration and 12 cm^3 0.02 N FAS solution in sample titration. Calculate COD of the effluent sample. **(5+5+5)**

3. (a) Explain the theory, Instrumentation and applications of Colorimetry
(b) Explain the Synthesis of Nanomaterials by sol gel method
(c) Explain properties and applications of Graphenes **(5+5+5)**

(OR)

4. (a) Explain the theory, Instrumentation and applications of Flame Photometry.
(b) Explain the Synthesis of Nanomaterials by chemical vapour deposition method
(c) Explain the properties and applications of fullerenes. **(5+5+5)**

PRINCIPAL
SIET., TUMAKURU

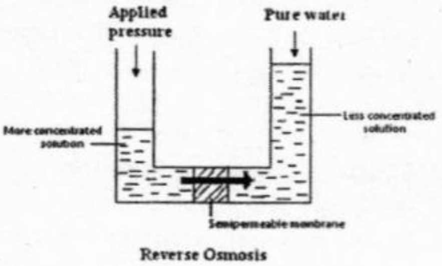
19-14

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY

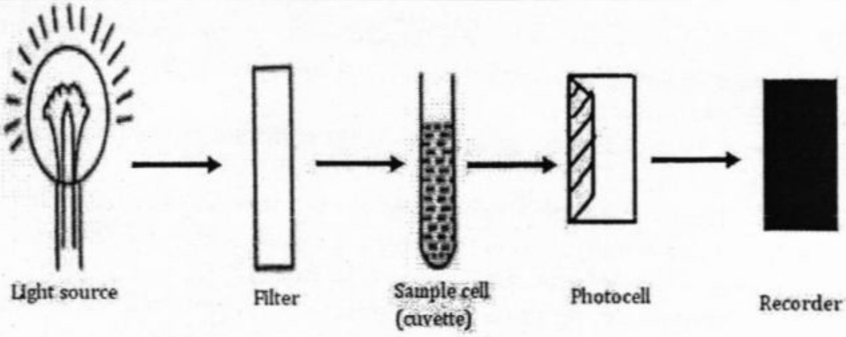
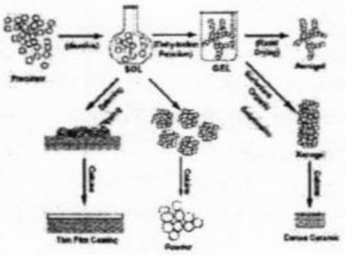
II semester: III-Internal assessment test

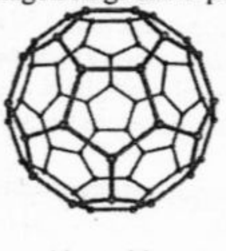
Scheme of valuation 13-06-19

Sub: Engineering Chemistry (18CHE12) Date: ~~15-04-2021~~

Q.no	Scheme	Marks
1. (a)	**What is boiler feed water?Write a note on scales and sludge formed in the boiler.**	**5Marks**
	Sludge formation: During the production of steam, water evaporates continuously leaving behind the dissolved salts in the boiler. Concentration of the salt increases and reaches saturation level to get precipitated. If the precipitate is soft, loose and suspended in boiler feed water is called as sludge. Causes for sludge formation: The impurities of water which causes sludge formation are MgCO3, MgSO4, and MgCl2 etc. If the sludge is not removed periodically, then it will form scale. Prevention of sludge formation: Sludge formation can be prevented by using softened water, more over sludge can be removed by flowing off technique ie. by drawing off some of the concentrated water from the bottom of the boiler through a tap. Disadvantages of scale and sludge formation: 1. The sludge is bad conductor of heat. So it requires more heating of boiler to produce steam which results in wastage of fuel. 2. Because of more and more heating of boiler, there is a chance of explosion of theboiler 3. It reduces the efficiency of boiler. 4. Sludge's need to be removed regularly and this cleaning process is expensive.	1mark 1mark 1mark 1mark 1mark
(b)	**What is desalination of water? explain reverse osmosis process.**	**5Marks**
	The process of removal of dissolved salts from sea water to the extent that water becomes usable is described as desalination. -The principle of osmosis is that water flows from lower concentration to higher concentration side through semi permeable membrane. If the pressure is applied on solution side, the solvent will flow in the reverse direction. This is called reverse osmosis. It is studied that sea water exerts an osmotic pressure of about 4500-5500 KPa. In reverse osmosis, hydrostatic pressure which is greater than osmotic pressure is applied on the salt solution side then water flows from salt solution to fresh water side. This water can be used for human consumption.  Applied pressure Pure water More concentrated solution Less concentrated solution Semipermeable membrane Reverse Osmosis	1mark 3mark 1mark
(c)	**Explain the determination of sulfate content of water by gravimetric method.**	**5Marks**
	Sulphate ions (SO4 2-) in water are due to the dissolved salts such as sulphates of sodium, potassium, magnesium etc. Principle: In gravimetric method, sulphate ions (SO4 2-) are quantitatively precipitated as BaSO4 by treating with BaCl2 in the presence of HCl, separated by filtration, dried and weighed as BaSO4. SO 2- + BaCl BaSO +2ClThe precipitate of BaSO4 is filtered through a quantitative filter paper and is washed with hot water. The precipitate is ignited in silica crucible and weighed as BaSO4. Procedure: 1. Take 1000 ml of water in large beaker, heat it on a hot plate and evaporate to reduce the volume to 100 ml. 2. Add half test tube of dilute HCl and heat the solution nearly to boiling. 3. To the hot solution add 1 test tube of BaCl2 solution slowly with constant stirring. Digest the solution on water bath for about 30 min. 4. Filter the solution using No.40 quantitative filter paper through a funnel & wash the precipitate with hot water several times to remove chloride ions. 5. Heat the funnel in an aluminium cone till filter is dry. Transfer the filter paper into a previously dried & weighed silica crucible and heat. 6. Transfer the hot silica crucible into desiccators and cool it. Weigh the crucible along with the	1mark 1mark 1mark 1mark 1mark

	precipitate of BaSO4. 7. Repeat the process of heating, cooling and drying till a constant weight is obtained.	
2.(a)	Explain the sources characteristics and disposal methods of Biomedical waste management	5 marks
	Bio-medical waste means "any solid and/or liquid waste produced during diagnosis, treatment or vaccination of human beings or animals. Biomedical waste creates hazard due to two principal reasons. The source of biomedical waste is the place or the location at which biomedical waste has been generated. • The source of biomedical waste is classified into two types based on the quantity of waste generated. • They include major and minor source. • Major source generates more amount of biomedical waste compared to minor source and also there is regular generation of biomedical waste in the major source which includes government hospitals, private hospitals, nursing home and dispensaries. • Minor source includes physicians and dental clinics. <u>Disposal</u> Before its final disposal of biomedical waste, it must be disinfected. • Anatomical waste can be disposed by deep burial. Syringes to be cut (with hub cutters) and chemically disinfected with1% bleaching powder solution at source of generation before final disposal into sharps pit. • Infected plastics to be chemically disinfected or autoclaved, shredded and recycled and sent for final disposal into municipal dumps.	
(b)	**Explai the activated sludge method of sewage treatment.**	**5Marks**
	During the production of steam, water evaporates continuously leaving behind the dissolved salts in the boiler. Concentration of the salt increases and reaches saturation level to get precipitated. If the precipitate is soft, loose and suspended in boiler feed water is called as sludge. Activated sludge is a thick greasy mud containing aerobic bacteria. This method involves extensive aeration of the sewage water after primary treatment is mixed with activated sludge and allowed to enter in a large aeration tank for biological treatment. Air is continuously passed into tank to maintain the aerobic condition. Under these condition microorganisms present in activated sludge attack on organic matter of sewage and decomposes them into CO2 and H2O. The effluent after this treatment is passed to sedimentation tank where sludge will settle down. The clear effluent is sent to tertiary treatment. A part of sludge is used for further treatment and rest is disposed off and used as manure.	1mark 2mark 1mark 1mark
(C)	In a COD experiment 25cm^3 of an effluent sample required 29.8 cm^3 of 0.02N FAS solution in blank titration and 12 cm^3 of 0.02N FAS solution in sample titration. Calculate COD of effluent sample.	**5Marks**
	COD of the waste water sample = N$_{FAS}$ xV2-V1x8x1000/V = 0.02x29.8-12x8x1000/25 = 113.92 mg/lit	
3.(a)	**Explain the theory, instrumentation and applications of colorimetry?**	**5Marks**
	Theory: Theory of the colorimeter is explained by Beer – Lambertz Law. When a monochromatic light is passed through a solution, a part of light is absorbed by the solution. The absorbance depends on the concentration of the solution and the path length of the light through the solution. Beer-Lambert's law: Absorbance is directly proportional to concentration and thickness. A = € ct € = molar absorption co-efficient A = Absorbance of light T = Path length C = Concentration of the solution **Instrumentation**: The instruments is used to measure the absorbance of a solution is called photoelectric colorimeter. It consists of **Source:** tungsten bulb or lamp is used as a light source. **Filter:** It is a device to provide desired wavelength range **Sample cell:** sample is hold in glass cell. **Photocell:** Converts the emitted light into electrical signal. When light is allowed to fall on the sample cell at particular wavelength. The blank solution is taken in the sample cell and placed in the path of light beam. Its absorbance is adjusted to zero. Then the analyte solution I placed in the path of light and its absorbance is measured. A plotof absorbance against standard concentrations of analyte is used to find the unknown concentration of analyte in the samples.	1mark 1mark 1mark 1mark 1mark

	 Light source Filter Sample cell (cuvette) Photocell Recorder **Applications:** • • In quantitative analysis: large number of metal ions, anions and cations compounds can be determined by in this method • • Photometric Titration i.e. equivalence point can also be determined • • Determination of the composition of colored complex	
b)	**Explain the synthesis of nanomaterial by sol gel process**	**5Marks**
	Sol-gel technique is an important bottom-up approach for the synthesis of Nanomaterials and it consists of a following steps. 1. Preparation of sol: A sol is prepared by dispersing precursors in solvent. 2. Conversion of sol into gel: The sol is further converted into a gel by hydrolysis and condensation of precursors. **Hydrolysis : -** $M (OC_2H_5)_4 + X H_2O \rightarrow M (OC_2H_5)_4 - X (OH)_X + X C_2H_5OH$ **Condensation:** $M (OC_2H_5)_4 - X (OH)X + M (OC_2H_5)_4 - X (OH)X \rightarrow (OC_2H_5)_4 - X (OH)X - 1$ $M - O - M (OH)X - 1 (OC_2H_5)_4 - X + H_2O$ 3. Aging of a gel: Gel on aging for a known period of time, finally condenses to nanoscale clusters of metal hydroxides 4. Removal of solvent: The solvent can be removed from gel by evaporative drying 5. Heat treatment: The obtained sample is heated at high temperature from nanoparticles **Applications** Used in optics and electronics (bio) sensors, medicine (e.g. controlled drug, chromatography) ultra filtration reverse osmosis. 	1mark 1mark 1mark 1mark 1mark
c)	**Explain the properties and application of Graphene?**	**5Marks**
	Properties: • Very high electrical conductivity when exposed to an electric field. • The strongest material ever measured. Up to 150 times stronger than the equivalent weight of steel . • Graphene oxide reportedly has the ability to attract radioactive material. • Graphene has the ability to transmit up to 98% of light. • It absorption of light across the visible and near-infrared parts of the spectrum **Applications:** It is used in touch screens, transistors, super capacitors, sensors, batteries, computer chips, water filters, solar cells etc..,	1mark 1mark 1mark 1mark 1mark
4. a)	Explain the theory instrumentation and appication of flame photometry.	**5Marks**
	Elements impart characteristic color with Bunsen flame. The flame photometry is based on the measurement of intensity of the light emitted when a metal is introduced into a flame. The intensity of the emitted light tells about the concentration of the element present. **Theory:** A photoelectric flame photometer is a device used in inorganic chemical analysis to determine the concentration of certain metal ions, among them sodium, potassium, lithium, and calcium that are easily excited to higher energy levels at a relatively low temperature flame.	1mark 1mark 1mark

	The excited metal atoms are not stable and they return to ground state by emitting radiation that is proportional to the concentration of metal ions in solution an di measured by flame photometer. **Instrumentation:** It consist of **Source of flame:** A Burner in the flame photometer is the source of flame. It can be maintained in at a constant temperature. **Optical system:** The optical system consists of convex mirror and convex lens. The convex mirror transmits the light emitted from the atoms. Convex mirror also helps to focus the emissions to the lens. The lens helps to focus the light on a point or slit. **Filters:** The reflections from the mirror pass through the slit and reach the filters. Filters will isolate the wavelength to be measured from that of irrelevant emissions. **Photo-detector:** The intensity of radiation emitted by the flame is measured by photo detector. Here the emitted radiation is converted to an electrical signal with the help of photo detector. These electrical signals are directly proportional to the intensity of light. Application: It is used in the quantitative determination of metals in solution, especially alkali & alkaline earth in the given sample.	1mark 1mark
b)	**Explain the synthesis of nano materials by chemical vapour deposition method.**	**5Mark**
	Principle: the process involved is conversion of precursor (metal organic compound) into vapors in reduced pressure atmosphere. Processes: the precursor (starting material) is vaporized in a bubble and mixed with inert gas like helium to carry vapors into heating furnace. Condensation reaction takes place in heating furnace at a particular temperature. The product formed after the condensation process is in the form of clusters. The clusters are then condensed into nano particles in a cold finger which are removed by scraping. Advantages: ➢ Simple technique and does not require high vacuum ➢ It is possible to deposit nano materials with almost any shape and size. The byproducts are removed to gas phase. Therefore the product obtained is pure.	1mark 1mark 1mark 1mark 1mark
c)	**Write a note on Fullerenes. Mention its applications**	**5Mark**
	A fullerene is any molecule composed of carbon in the form of a hollow sphere, ellipsoid, tube, and many other shapes. Spherical fullerenes are also called bucky balls, and they resemble the balls used in football (soccer). Cylindrical ones are called carbon nanotubes or bucky tubes. Fullerenes are similar in structure to graphite, which is composed of stacked graphene sheets of linked hexagonal rings, but they may also contain pentagonal (or sometimes heptagonal) rings. **Structure of C60 Fullerene** Contains 60 carbon atoms 12 Pentagon rings and 20 Hexagon rings Each pentagon ring is surrounded by 5 hexagon rings Each Hexagon ring is surrounded by 3 hexagon rings and 3 pentagon rings  **Applications of Fullerenes** 1) Polymer composite of C60 molecule is used in making organic photovolatic cells. 2) Fullerenes have been extensively used for several biomedical applications including the design of high-performance MRI contrast agents, 3) X-Ray imaging contrast agents, 4) Photodynamic therapy, drug and gene delivery.	1mark 1mark 1mark 1mark 1mark

PRINCIPAL
SIET., TUMAKURU

18-19
I Sem

SHRIDEI INSTITUTE OF ENGINEERING AND TECHNOLOGY

An ISO 9001:2015 Certified Institution

I Semester: I-Internal assessment test
Sub: Engineering Chemistry (18CHE12)

Time: 90minutes **Section: C & D** **Max Marks: 30**

***NOTE*: Answer any *TWO FULL* questions.**

1. (a) Derive Nernst equation for single electrode potential
(b) Explain the construction, working and advantages of Calomel electrode.
(c) What are electrolytic concentration cells? Explain with an example **(5+5+5)**

(OR)

2. (a) Explain the construction, working and uses of Ni-MH battery.
(b) Explain the construction, working and uses of Li-CoO_2 battery.
(c) Calculate the emf of the concentration cell Cu(s) /Cu SO_4 (0.01M) // Cu SO_4 (1M) / Cu(s) at 298K. Write the cell reactions. **(5+5+5)**

3. (a) Explain the electrochemical theory of corrosion.
(b) What is cathodic protection? Explain the Sacrificial anodic protection method of corrosion
(c) Explain the anodizing process of aluminium **(5+5+5)**

(OR)

4. (a) What is metal finishing? Mention the technological importance of metal finishing.
(b) Explain the electro less plating process of Copper.
(c) What is electro less plating? Give the differences between electro plating and electro less Plating. **(5+5+5)**

……

SHRIDEI INSTITUTE OF ENGINEERING AND TECHNOLOGY

An ISO 9001:2015 Certified Institution

I Semester: I-Internal assessment test
Sub: Engineering Chemistry (18CHE12)

Time: 90minutes **Section: C & D** **Max Marks: 30**

***NOTE*: Answer any *TWO FULL* questions.**

1. (a) Derive Nernst equation for single electrode potential
(b) Explain the construction, working and advantages of Calomel electrode.
(c) What are electrolytic concentration cells? Explain with an example **(5+5+5)**

(OR)

2. (a) Explain the construction, working and uses of Ni-MH battery.
(b) Explain the construction, working and uses of Li-CoO_2 battery.
(c) Calculate the emf of the concentration cell Cu(s) /Cu SO_4 (0.01M) // Cu SO_4 (1M) / Cu(s) at 298K. Write the cell reactions. **(5+5+5)**

3. (a) Explain the electrochemical theory of corrosion.
(b) What is cathodic protection? Explain the Sacrificial anodic protection method of corrosion.
(c) Explain the anodizing process of aluminium **(5+5+5)**

(OR)

4. (a) What is metal finishing? Mention the technological importance of metal finishing.
(b) Explain the electro less plating process of Copper.
(c) What is electro less plating? Give the differences between electro plating and electro less Plating. **(5+5+5)**

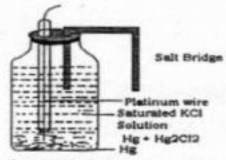
PRINCIPAL
SIET., TUMAKURU.

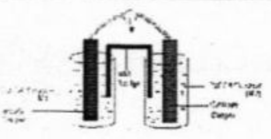
SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY

I semester: I-Internal assessment test

Scheme of valuation

Sub: Engineering Chemistry (18CHE12)

Q.no	Scheme	Marks
1. (a)	**Derive Nernst equation for single electrode potential**	**5Marks**
	The maximum work available from a reversible chemical process is equal to the maximum amount of electrical energy that can be obtained; it shows decrease in free energy. $W_{max} = - \Delta G$ There fore $\Delta G = -nFE$ $\boxed{E = \frac{\Delta G}{-nF}}$ $\boxed{E^o = \frac{\Delta G^o}{-nF}}$ Consider the following reversible electrode reaction, $\boxed{M^{n+} + ne^- \rightleftharpoons M}$ For the above reaction the equilibrium constant (Kc) can be written as, $Kc = \frac{[M]}{[M^{n+}]}$ Kc and ΔG are related according to the following thermodynamic equation $\boxed{\Delta G = \Delta G^o + RT \ln Kc}$ ----------------→1 Dividing the equation 1 by − nF and Substituting the value of Kc, $\frac{\Delta G}{-nF} = \frac{\Delta G^o}{-nF} + \frac{RT \ln}{-nF}[M] / [M^{n+}]$ -------------→2 Substituing the values of $\frac{\Delta G}{-nF}$ and $\frac{\Delta G^o}{nF}$ in equation 3, Equation 3 => $E = E^o + \frac{RT \ln [M^{n+}]}{nF}$ When [M] = 1 $E = E^o + \frac{2.303RT}{nF}\log_{10}[M^{n+}]$ ——→ Nernst equation	1mark 1mark 1mark 1mark 1mark
(b)	**Explain the construction, working and advantages of Calomel electrode.**	**5Marks**
	Fig and Labeling Explanation Reactions  Salt Bridge Platinum wire Saturated KCl Solution Hg + Hg2Cl2 Hg Calomel electrode • Calomel electrode consisting of a glass container at the bottom of which mercury is placed and above which a layer of mercury and mercurous chloride (called calomel) is placed • 3/4th of bottle is filled with saturated KCl solution. • Calomel Electrode potential depends on the concentration of chloride ions. • The calomel electrode acts as both anode and cathode depending upon the other electrode used. • The platinum wire is used for electrical connections. Salt bridge is used to couple with other half cell. • The calomel electrode can be represented as $Hg (l) / Hg_2Cl_2 (S) / Cl^-$ • When it acts as anode the electrode reactions is, • $2Hg + 2Cl^- \longrightarrow Hg_2Cl_2 + 2e^-$ • When it acts as cathode the electrode reaction is • $Hg_2Cl_2 + 2e^- \longrightarrow 2Hg + 2Cl^-$ •	1mark 3mark 1mark
(c)	**What are electrolytic concentration cells? Explain with an example**	**5Marks**
		1mark



Concentration Cell

Fig and Labeling 1mark

Explanation

Reactions

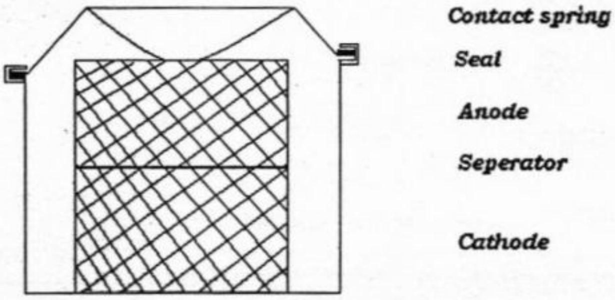
Formula 1mark

- These are the galvanic cells consisting of same metal electrodes as anode and cathodes dipped in same electrolytic solution but are different in the electrolyte concentration. 1mark
- **Ex:** Consider the following concentration cell constructed by dipping two copper electrodes in Cuso$_4$ solutions of concentration M_2 molar and M_1 molar, where $M_2M > M_1M$. 1mark
- The two half-cell are internally connected by a salt bridge and externally connected by a metallic wire through voltmeter
- The electrode, which is dipped in less electrolytic concentration solution (M_1M) act as anode and undergoes oxidation. The electrode, which is dipped in more electrolytic concentration solution (M_2M) act as cathode and undergoes reduction.
- At anode : $Cu(S) \longrightarrow Cu^{2+}(M_1) + 2e^-$
- At cathode : $Cu^{2+}(M_2) + 2e^- \longrightarrow Cu(S)$
- Net Cell Reaction: $Cu^{2+}(M_2) \longrightarrow Cu^{2+}(M_1)$
- E of cell = E cathode – E anode.
- $E\ cell = \left(E^\circ + \frac{0.0591}{n} \log[M2]\right) - \left(E^\circ + \frac{0.0591}{n} \log[M1]\right)$

$$\boxed{E\ cell = \frac{0.0591}{n} \log \frac{[M2]}{[M1]}}$$

2.(a) Explain the construction, working and uses of Ni-MH battery? **5Marks**

1



Nickel - Metal hydride Battery

1

1

1

Nickel Metal hydride battery is made up of anode containing metal hydride such as ZrH_2, VH_2 and TiH_2 with hydrogen storage metal alloy such as La Ni_5 or TiNi.Cathode consisting of nickel oxy hydroxide both the compartments are separated by polypropyl. KOH used as electrolyte. Cell reactions are as follows. 1

At anode : $MH + OH^- \longrightarrow M + H_2O + e^-$

At cathode : $NiO(OH) + e^- + H_2O \longrightarrow Ni(OH)2 + OH^-$

NCR : $MH + NiO(OH) \longrightarrow M + Ni(OH)2 + M$

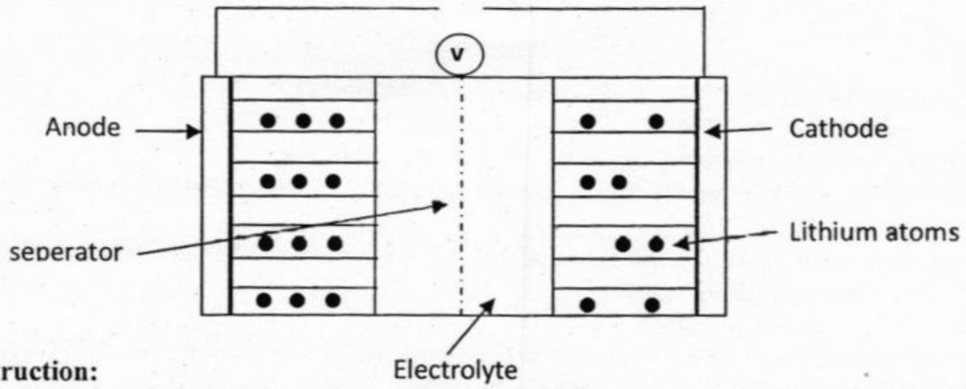
Applications: Used in electric vehicles, laptops, cellular phones etc.,

Advantages: i) Resistance to chemical oxidation

ii) High energy storage capacity.

2. (b) Explain the construction, working and uses of Li-CoO2 battery? **5Marks**

1mark

<table>
<tr><td></td><td>


Construction:

$LiCoO_2$ battery contains anode made up of layered graphite and contains Lithium atoms in between the layers called intercalation.

The cathode of the battery is made of layered cobalt oxide and contains Lithium atoms in between the layers.

The cathode and anode are separated by polymeric separator.

Lithium salt such as $LiPF_6$ is used as electrolyte.

Working:

During discharging the lithium atoms undergoes oxidation and moves toward cathode as lithium ions. At cathode the reduction of Co^{4+} ions into Co^{3+} ions takes place and lithium ions enters into Cobalt oxide layers as lithium atoms.

At anode: $xLiC \rightleftharpoons C + xLi^+ + xe^-$

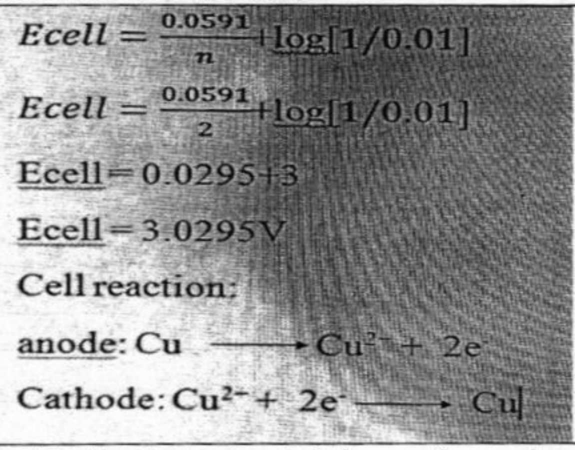
At cathode: $CoO_2 + xLi^+ + xe^- \rightleftharpoons LiCoO_2$

Net cell reaction: $xLiC + CoO_2 \rightleftharpoons C + LiCoO_2$

Advantages:

- They have high power to weight ratio.
- They have high energy efficiency.
- Performance of the battery is good at even high temperature.
- They have high cycle life.
- These have longer charge retention than other batteries.
</td><td>2mark
1mark
1mark</td></tr>
<tr><td>(C)</td><td>

Calculate the EMF of the concentration cell $Cu(s) / CuSO_4(0.01M) // CuSO_4(1M) / Cu(s)$ at 298K write the cell reaction.

</td><td></td></tr>
<tr><td></td><td>


$Ecell = \frac{0.0591}{n} + \log[1/0.01]$

$Ecell = \frac{0.0591}{2} + \log[1/0.01]$

Ecell = 0.0295+3

Ecell = 3.0295V

Cell reaction:

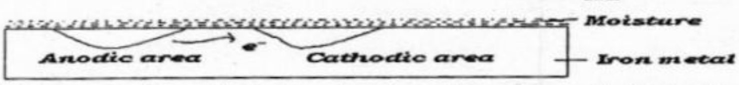
anode: $Cu \longrightarrow Cu^{2+} + 2e^-$

Cathode: $Cu^{2+} + 2e^- \longrightarrow Cu$
</td><td>5marks
1
1
1
1</td></tr>
<tr><td>3.(a)</td><td>

Explain the electrochemical theory of corrosion

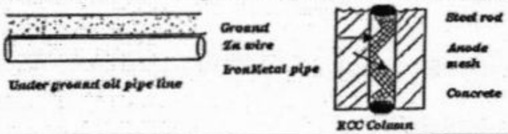
</td><td>5marks</td></tr>
<tr><td></td><td>

According to electrochemical theory, corrosion of metals occurs due to the following changes, when they are exposed to the environment



1) A large number of minute galvanic cells are formed which acts as anodic and cathodic areas.

2) At anodic area the metal undergoes oxidation and electrons are liberated which migrates towards Cathodic region.
</td><td>1
1
1
1</td></tr>
</table>

	$M \longrightarrow M^{n+} + ne^-$ Metal Metal ions Ex: when iron is exposed to the environment it undergoes oxidation as $Fe \longrightarrow Fe^{2+} + 2e^-$ 3) At Cathodic area different reduction reactions takes place as follows a) In acidic and deaerated medium: Hydrogen ions are reduced to hydrogen gas by reacting with electrons. $2H^+ + 2e^- \longrightarrow H_2$ b) In alkaline and deaerated medium: Moisture of the environment reacts with electrons producing hydroxyl ions and Hydrogen gas at cathode. $2H_2O + 2e^- \longrightarrow 2OH^- + H_2$ c) In neutral and aerated medium: Moisture of the environment reacts with electrons and Oxygen and produces hydroxyl ions at cathode. $2H_2O + O_2 + 4e^-$ $4OH^- \longrightarrow$ 4) Formation of corrosion product: The hydroxyl ions formed at Cathodic area reacts with metal ions (M^{n+} ions) formed at Anodic area and forms metal hydroxides which further reacts with moisture and oxygen forming an insoluble Metal oxide corrosion product. In the case of iron OH- reacts with Fe^{2+} ions, O_2 and moisture producing an insoluble hydrated ferric oxide known as brown rust. $2Fe^{++} + 4OH^- \longrightarrow 2Fe(OH)_2$ $2Fe(OH)_2 + O_2 + nH_2O \longrightarrow Fe_2O_3 . nH_2O$ (rust)	1
(b)	What is cathodic protection ? Explain sacrificial anodic protection.	5
	Cathodic protection is a method in which the metal to be protected from corrosion is made as cathode by attaching more active anodic metal to it. The following methods are used to protect the metal from corrosion by Cathodic protection. a) Sacrificial anodic protection method. In this method the more active metals like Zn, Mg, and Al etc are used as anodic metals and attached to the base metal(metal tobe protected from corrosion). The anodic metals being more reactive undergoes corrosion but base metal remains unaffected .The sacrificial anodes have to be replaced from time to time after complete corrosion. The method is used for protecting buried pipeline, ship hulls, industrial water tank steel rods in RCC columns. Several hundred kilometers long zinc wire is buried along oil pipe line in Alaska is an example for sacrificial anodic protection method  Ground Zn wire IronMetal pipe Under ground oil pipe line Steel rod Anode mesh Concrete RCC Column	1 1 1 1 1
(C).	**Explain the anodizing process of aluminium**	5
	- Pretreatment: The article be anodized is degreased and followed by electro polished - Aluminum is connected to positive terminal and made as anode. - Steel or copper is connected to negative terminal and made as cathode - The anode and cathode are dipped in electrolyte solution containing 5-10% chromic acid. - The temperature of the bath is maintained at 35^0c - Voltage is applied between 0-50V. - First ten minutes potential is increased to 0-40V. - After 20 minutes voltage is applied from 40-50V - The voltage is kept constant at 50 V for five minutes. - During this period, 2-8 micrometer thick aluminum oxide layer is obtained. - Finally the object is treated with Ni or Cobalt acetate fallowed by boiling water treatment to improve corrosion resistance. - For higher thickness 10% H_2SO_4 is used as electrolyte. At anode: $2Al(s) + 3H_2O(l) \longrightarrow Al_2O_3(s) + 6H^+ + 6e^-$ At cathode: $6H^+ + 6e^- \longrightarrow 3H_2(g)$ Over all reaction: $2Al(s) + 3H_2O(l) \longrightarrow Al_2O_3(s) + 3H_2$	1 1 1 1 1
4.(a)	**What is metal finishing? Mention the technological importance of metal finishing**	5
	It is a process of modifying surface properties of metals by deposition of a layer of another metal or polymer on its surface, by the formation of an oxide film.	2
	Technological importance of metal finishing. Imparting the metal surface to higher corrosion resistance.	1

<table>
<tr><td></td><td>Imparting improved wear resistance.
Providing electrical and thermal conducting surface.
Imparting thermal resistance and hardness.
Providing optical and thermal reflectivity.
In the manufacture of electrical and electronic components such as PCB's, capacitors, etc</td><td>
1
1

</td></tr>
<tr><td>(b)</td><td><b>Explain the electroless plating of copper</b></td><td>5</td></tr>
<tr><td></td><td>Metal ions + Reducing agent → Metal + Oxidized product
Plating bath Solution: $CuSO_4.5H_2O$ (12 g per dm^3), NaOH (15 g per/L
Rochelle salt (14 g per dm^3), EDTA (15 g per dm^3) Reducing Agent
: Formaldehyde (8 g per dm^3)
Complexing agent : EDTA Solution.
P^H : 11 - 12
Temperature : 25 ^{0}c
At Anode : $2HCHO + 4OH^- \rightarrow 2HCOO^- + 2H_2O + H_2 + 2e^-$
At Cathode : $Cu^{2+} + 2e^- \rightarrow Cu$
Overall reactions : $4OH^- + Cu^{2+} + 2HCHO \rightarrow Cu + 2HCOO^- + 2H_2O + H_2$</td><td>1

1

1
1

1</td></tr>
<tr><td>(c)</td><td><b>What is electroless plating? Give the differences between Electroless plating and Electroplating.</b></td><td>5</td></tr>
<tr><td></td><td>It is process of deposition of a metal from its salt solution on a catalytically active surface of a substrate by using suitable reducing agent and without using electrical energy.
<table>
<tr><th>Electroplating</th><th>Electroless plating</th></tr>
<tr><td>1. require electrical power source and accessories.</td><td>1. require electrical power source and accessories.</td></tr>
<tr><td>2. Deposition can't be made on non-conductors such as plastics, ceramics etc.</td><td>2. Deposition can be made on non-conductors such as plastics, ceramics etc.</td></tr>
<tr><td>3. requires Levelers</td><td>3. Does not require Levelers</td></tr>
<tr><td>4. Plating baths don't have excellent throwing power.</td><td>4. Plating baths have excellent throwing power.</td></tr>
</table></td><td>1
1
1
1

1</td></tr>
</table>

SHRIDEI INSTITUTE OF ENGINEERING AND TECHNOLOGY

I Semester: II-Internal assessment test **Date: 13-12-18**
Sub: Engineering Chemistry (18CHE12)
Time: 90minutes **Section: C & D** **Max Marks: 30**

***NOTE*: Answer any *TWO FULL* questions.**

1. (a) Define metal finishing and mention the technological importance of metal finishing
   (b) Explain the electroplating of chromium and mention why chromium anodes are not used
   (c) Define electro less plating and differentiate electroplating and electro less plating **(5+5+5)**

(OR)

2. (a) Explain the electro less plating process of Nickel.
   (b) Explain the electro less plating process of copper
   (c) Write a note on Decomposition potential and over voltage **(5+5+5)**

3. (a) Explain the determination of calorific value of solid fuel using Bomb calorimeter.
   (b) What is Knocking of petrol engine? Explain the Mechanism of Knocking
   (c) Explain the construction and working of Methanol – Oxygen fuel cell. **(5+5+5)**

(OR)

4. (a) Explain the construction and working of Solid oxide fuel cell (SOFC)
   (b) Explain the construction and working of photovoltaic cell.
   (c) Calculate GCV and NCV of a fuel from the following data.
   Mass of fuel =0.65g, W_1= 2800g, W_2 = 700 g, t_2 =27.2^{0}C, t_1 = 23.4^{0}C,
   % H_2 = 1.5 and S = 1 cal/g/^{0}C. **(5+5+5)**

……

SHRIDEI INSTITUTE OF ENGINEERING AND TECHNOLOGY

I Semester: II-Internal assessment test Date: 13-12-18
Sub: Engineering Chemistry (18CHE12)
Time: 90minutes Section: C & D Max Marks: 30

NOTE: Answer any TWO FULL questions.

1. (a) Define metal finishing and mention the technological importance of metal finishing
   (b) Explain the electroplating of chromium and mention why chromium anodes are not used
   (c) Define electro less plating and differentiate electroplating and electro less plating (5+5+5)

(OR)

2. (a) Explain the electro less plating process of Nickel.
   (b) Explain the electro less plating process of copper
   (c) Write a note on Decomposition potential and over voltage (5+5+5)

3. (a) Explain the determination of calorific value of solid fuel using Bomb calorimeter.
   (b) What is Knocking of petrol engine? Explain the Mechanism of Knocking
   (c) Explain the construction and working of Methanol – Oxygen fuel cell. (5+5+5)

(OR)

4. (a) Explain the construction and working of Solid oxide fuel cell (SOFC)
   (b) Explain the construction and working of photovoltaic cell.
   (c) Calculate GCV and NCV of a fuel from the following data.
   Mass of fuel =0.65g, W_1= 2800g, W_2 = 700 g, t_2 =27.2^{0}C, t_1 = 23.4^{0}C,
   % H_2 = 1.5 and S = 1 cal/g/^{0}C. (5+5+5)

18-19

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY

I semester: II-Internal assessment test

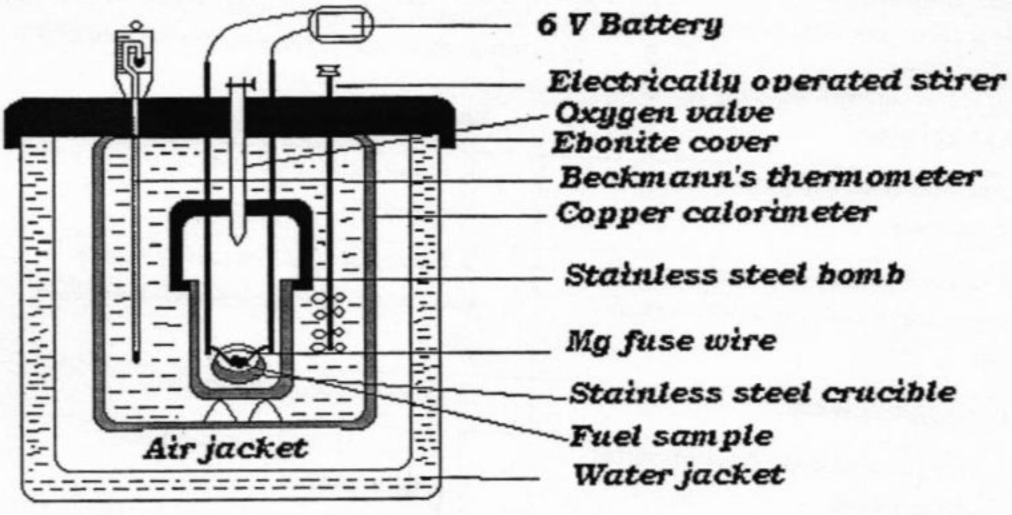
Scheme of valuation

Sub: Engineering Chemistry (18CHE12) **Date: 13-12-2018**

Q.no	**Scheme**	**Marks**
1. (a)	**What is metal finishing? Mention the technological importance of metal finishing**	**5Marks**
	It is a process of modifying surface properties of metals by deposition of a layer of another metal or polymer on its surface, by the formation of an oxide film.	1mark
	Technological importance of metal finishing.	1mark
	Imparting the metal surface to higher corrosion resistance.	
	Imparting improved wear resistance.	1mark
	Providing electrical and thermal conducting surface.	
	Imparting thermal resistance and hardness.	1mark
	Providing optical and thermal reflectivity.	
	In the manufacture of electrical and electronic components such as PCB's, capacitors, etc	1mark
(b)	**Explain the electroplating of Cr, mention why cr anodes are not used.**	**5Marks**
	Plating bath Chromic acid and H_2SO_4 in 100:1 proportion.	1mark
	Temperature $45\text{-}60^0C$.	3mark
	Current Density $100\text{-}200 mA/Cm^2$.	1mark
	Anode Insoluble anodes Pb-Sb or Pb-Sn coated with PbO_2.	
	Cathode Object to be plated.	
	Applications:	
	a)Decorative chromium provides a durable finish on cycles, automobiles, furnitures, air craft and surgical instruments etc	
(c)	**What is electroless plating? Give the differences between Electroless plating and Electroplating.**	**5Marks**
	It is process of deposition of a metal from its salt solution on a catalytically active surface of a substrate by using suitable reducing agent and without using electrical energy.	1mark

Electroplating	**Electroless plating**	
1. require electrical power source and accessories.	1. require electrical power source and accessories.	1mark 1mark
2. Deposition can't be made on non-conductors such as plastics, ceramics etc.	2. Deposition can be made on non-conductors such as plastics, ceramics etc.	1mark
3. requires Levelers	3. Does not require Levelers	1mark
4. Plating baths don't have excellent throwing power.	4. Plating baths have excellent throwing power.	

Q.no	Scheme	Marks
2.(a)	Explain electroless pating of nickel	**5Marks**
	Plating bath solution: $NiCl_2$ $20g/dm^3$, Sodium hypophosphate $20g/dm^3$ Sodium Acetate buffer $10g/dm^3$. Sodium succinate $15\ g/dm^3$	
	Complexing agent: Sodium Succinate.	
	P^H: 4.5	
	Temperature: 93^0C	
	Anodic reaction: $H_2PO_2^- + H_2O \longrightarrow H_2PO_3^- + 2H^+ + 2e^-$	
	Cathodic reactions: $Ni^{2+} + 2e^- \longrightarrow Ni$.	
	Overall reaction: $Ni^{2+} + H_2PO_2^- + H_2O \longrightarrow Ni + H_2PO_3^- + 2H^+$.	
	Uses:	
	i)Used to plate on industrial components such as pumps and valves, shafts, gears, reaction vessels and other tools.	

	ii) To coat on steel, plastic, PCB's etc.	
2. (b)	**Explain the electroless plating of copper**	**5Marks**
	Metal ions + Reducing agent → Metal + Oxidized product Plating bath Solution: $CuSO_4.5H_2O$ (12 g per dm^3), NaOH (15 g per/L Rochelle salt (14 g per dm^3), EDTA (15 g per dm^3) Reducing Agent : Formaldehyde (8 g per dm^3) Complexing agent : EDTA Solution. p^H : 11 - 12 Temperature : 25 ^{0}c At Anode : $2HCHO + 4OH^- \rightarrow 2HCOO^- + 2H_2O + H_2 + 2e^-$ At Cathode : $Cu^{2+} + 2e^- \rightarrow Cu$ Overall reactions : $4OH^- + Cu^{2+} + 2HCHO \rightarrow Cu + 2HCOO^- + 2H_2O + H_2$	1mark 2mark 1mark 1mark
(C)	**Write a note on decomposition potential and over voltage.**	
	It is defined as the minimum external voltage that must be applied in order to bring about continuous electrolysis of an electrolyte. Electrolysis of an electrolyte occurs only when applied voltage is above certain value below which electrolysis do not occur. This can be determined by an electrolytic cell, if dilute acid or bases are used as electrolytes decomposition occurs when voltage is increased with sudden evolution of H2 and O2 at the electrodes. It is defines as excess voltage that has to be applies above theoretical decomposition potential to bring the continuous electrolysis of an electrolyte is known as over voltage.	5marks 1 1 1 1
3.(a)	**Explain the determination of Calorific value of solid fuel using Bomb calorimeter**	5marks
	 6 V Battery Electrically operated stirer Oxygen valve Ebonite cover Beckmann's thermometer Copper calorimeter Stainless steel bomb Mg fuse wire Stainless steel crucible Fuel sample Air jacket Water jacket **Bomb Calorimeter** A small quantity of a fuel is weighed accurately (M Kg) and is placed in the Bomb. The bomb is placed in known amount water taken in a copper calorimeter. The initial temp of water is noted as a $t_1{}^0$C with the help of thermometer. Oxygen gas is pumped under pressure 20 to 25 atm through the O_2 valve provided. The fuel is ignited by passing electric current through the wires provided. As the fuel undergoes combustion and liberates heat, which is absorbed by surrounding water. The water is stirred continuously to distribute the heat uniformly and the final temp attained by water is noted $t_2{}^0$C. & gross calorific value of the fuel is calculated as follows:- *Calculation:* Mass of the fuel = M Kg. Initial temp of the water = $t_1{}^0$C Final temp of the water = $t_2{}^0$C Change in temp = $t = (\triangle - t_1)^0$ C Specific heat of water = S	1 1 1 1 1

Water equivalent of calorimeter = W Kg.

$$GCV = \frac{W \times S \times \quad t}{\triangle \quad M} \ J/Kg \qquad \text{or}$$

$$GCV = \frac{(W+w) \times S \times \quad t\triangle}{M} \ J/Kg$$

$$NCV \ = GCV - 0.09 \times \%H_2 \times 587 \ \ cal/g$$

(b) **What is knocking of petrol engine? Explain the mechanism of knocking.** 5

The explosive combustion of petrol and air mixture produces shock waves in I.C. engine, which hit the walls of the cylinder and piston producing a rattling sound is known as knocking. 1

Mechanism of Knocking 1

Beyond a particular compression ratio the petrol mixture suddenly burns into flame. The rate of flame propagation increases from 20 to 25m/s to 2500m/s, which propagates very fast, producing a rattling sound. The activated peroxide molecules decomposes to give number of gases products which produces thermal shock waves which hit the walls of the cylinder and piston causing a rattling sound which is known as knocking. 1 1 1

The reactions of normal and explosive combustion of fuel can be given as follows taking ethane as an example

$C_2H_6 + 3\frac{1}{2} O_2 \rightarrow 2CO_2 + 3H_2O$ (Normal combustion reaction)

$C_2H_6 + O_2 \rightarrow CH_3\text{-}O\text{-}O\text{-}CH_3$ (Explosive combustion reaction)

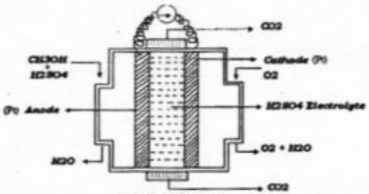
$CH_3\text{-}O\text{-}O\text{-}CH_3 \rightarrow CH_3\text{-}CHO + H_2O$

$CH_3\text{-}CHO + 1\frac{1}{2} O_2 \rightarrow HCHO + CO_2 + H_2O$

$HCHO + O_2 \rightarrow CO_2 + H_2O$

(C). **Explain the construction, working and uses of Methanol oxygen fuel cell** 5

It consists of two electrodes made up of platinum as anode and cathode and in between the electrodes H_2SO_4 is placed as a electrolyte. Methanol and H_2SO_4 is supplied at the anode and pure oxygen gas is supplied at the cathode. The methanol is oxidized to CO_2 & H_2O with the liberation of 1.20v of electrical energy. 1 1 1



CH3OH - O2 Fuel cell

1 1

The cell reactions are as follows.

At anode : $CH_3OH + H_2O \longrightarrow CO_2 + 6H^+ + 6e^-$

At cathode : $\frac{3}{2} O_2 + 6H^+ + 6e^- \longrightarrow 3H_2O$

NCR : $CH_3OH + \frac{3}{2} O_2 \longrightarrow CO_2 + 2H_2O$

Applications:

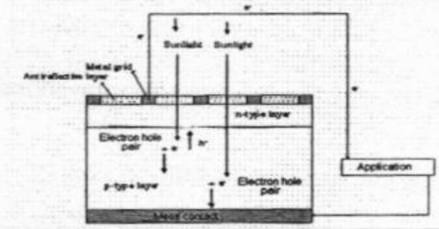
1) Used in Military applications.

Used for large scale power production stations.

4.(a) **Explain the construction, working and uses of solid oxide fuel cells** 5

These contains ZrO_2, Y_2O_3 are solid electrolytes. Cathode is made up of porous strontium doped with $LaMnO_3$ or In_2O_3 and SnO_2. Anode is made up of cobalt, nickel, or ZrO2. Operating temperature is 1000^0C. 2 1 1

PRINCIPAL
SIET., TUMAKURU.

	<u>**Uses:**</u> These cells are used in KW power plants	1
(b)	**Explain the construction, working of photo voltaic cell.**	5
	A typical silicon photovoltaic cell is composed of a thin layer of phosphorus doped. (n-type) semiconductor on the top and a thick layer boron doped p-type semiconductor at the bottom. Hence a p-n junction is formed. A metallic grid forms one of the electrical current contacts of the diode and allows light to fall on the semiconductor between the grid lines. An antireflective layer (TiO_2 or silicon nitride) between the grid lines increases the amount of light transmitted. When light radiation falls on the p-n junction, electron – hole pairs are generated by the absorption of the sun radiation. The electrons are moves and collect at the n-type end and the holes moves to p-type end. When these two ends are electrically connected through a conductor, photoelectric current is produced.  Sunlight Sunlight Metal grid Antireflective layer n-type layer Electron hole pair p-type layer Electron hole pair Metal contact Application	1 1 1 1 1
(c)	Calculate GCV and NCV of a fuel from the following data. Mass of fuel=0.75g, W=2.5Kg, w_2=0.65Kg. t_1=24, t_2=27, % H_2=5.	5
	$GCV = \frac{(W+w) \times \triangle t \times S}{M}$ $= \frac{(2.5+0.65) \times 3.2 \times 4.187}{0.75 \times 10^{-3}}$ $GCV = 56273.28$ KJ/Kg $NCV = GCV - 0.09 \times H \times 587 \times 4.184$ $= 25271.36 - 0.09 \times 5 \times 587 \times 4.187$ $NCV = 24165.36$ KJ/Kg	1 1 1 1 1

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI

SHRIDEI INSTITUTE OF ENGINEERING AND TECHNOLOGY

An ISO 9001:2015 Certified Institution

I Semester: III-Internal assessment test **Date: 14-1-19**
Sub: Engineering Chemistry (18CHE12)
Time: 90minutes **Section: C & D** **Max Marks: 30**

***NOTE*: Answer any *TWO FULL* questions.**

1. (a) Explain the determination sulphate content in water by gravimetric method.
   (b) Explain the softening of water by Ion exchange process.
   (c) Explain the Sources, effects and control of ozone air pollution and write a note on ozone depletion **(5+5+5)**

(OR)

2. (a) Explain the desalination of water by Reverse osmosis method.
   (b) Explain the Sources, effects and control of Carbon monoxide air pollution.
   (c) Explain the boiler corrosion due to dissolved O_2, CO_2 and $MgCl_2$. **(5+5+5)**

3. (a) Explain Theory, Instrumentation and applications of Flame Photometry.
   (b) Explain the titration curve for mixture of strong acid and a weak acid with a strong base
   (c) Explain Properties and applications of Graphenes. **(5+5+5)**

(OR)

4. (a) Explain Theory, Instrumentation and applications of Colorimetry.
   (b) Explain the synthesis of nanoparticles by chemical vapour deposition.
   (c) Explain Properties and applications of fullerenes. **(5+5+5)**

SHRIDEVI

SHRIDEI INSTITUTE OF ENGINEERING AND TECHNOLOGY

An ISO 9001:2015 Certified Institution

I Semester: III-Internal assessment test **Date: 14-1-19**
Sub: Engineering Chemistry (18CHE12)
Time: 90minutes **Section: C & D** **Max Marks: 30**

***NOTE*: Answer any *TWO FULL* questions.**

1. (a) Explain the determination sulphate content in water by gravimetric method.
   (b) Explain the softening of water by Ion exchange process.
   (c) Explain the Sources, effects and control of ozone air pollution and write a note on ozone depletion **(5+5+5)**

(OR)

2. (a) Explain the desalination of water by Reverse osmosis method.
   (b) Explain the Sources, effects and control of Carbon monoxide air pollution.
   (c) Explain the boiler corrosion due to dissolved O_2, CO_2 and $MgCl_2$. **(5+5+5)**

3. (a) Explain Theory, Instrumentation and applications of Flame Photometry.
   (b) Explain the titration curve for mixture of strong acid and a weak acid with a strong base
   (c) Explain Properties and applications of Graphenes. **(5+5+5)**

(OR)

4. (a) Explain theory, instrumentation and applications of Colorimetry.
   (b) Explain the synthesis of nanoparticles by chemical vapour deposition.
   (c) Explain Properties and applications of fullerenes. **(5+5+5)**

PRINCIPAL
SIET., TUMAKURU.

18 19

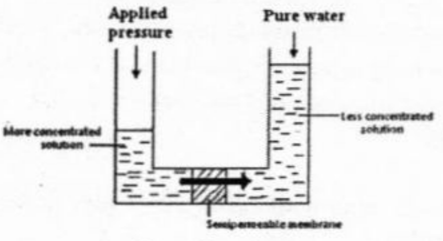
SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY

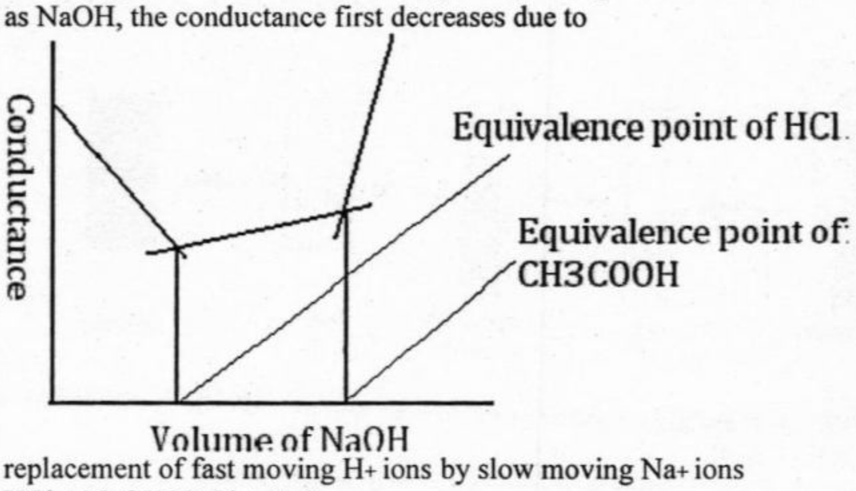
I semester: III-Internal assessment test

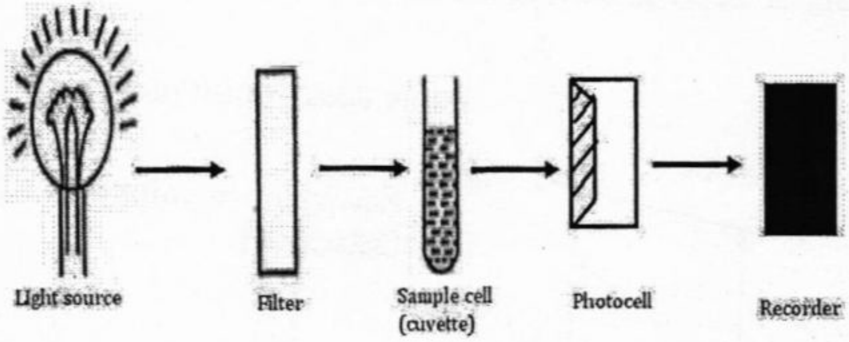
Scheme of valuation

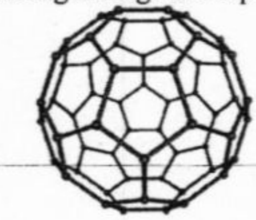
Sub: Engineering Chemistry (18CHE12) **Date: 14-01-2019**

Q.no	Scheme	Marks
1. (a)	**Explain the determination of sulfate content of water by gravimetric method.**	**5Marks**
	Sulphate ions (SO4 2-) in water are due to the dissolved salts such as sulphates of sodium, potassium, magnesium etc. Principle: In gravimetric method, sulphate ions (SO4 2-) are quantitatively precipitated as BaSO4 by treating with BaCl2 in the presence of HCl, separated by filtration, dried and weighed as BaSO4. SO 2- + BaCl BaSO +2ClThe precipitate of BaSO4 is filtered through a quantitative filter paper and is washed with hot water. The precipitate is ignited in silica crucible and weighed as BaSO4. Procedure: 1. Take 1000 ml of water in large beaker, heat it on a hot plate and evaporate to reduce the volume to 100 ml. 2. Add half test tube of dilute HCl and heat the solution nearly to boiling. 3. To the hot solution add 1 test tube of BaCl2 solution slowly with constant stirring. Digest the solution on water bath for about 30 min. 4. Filter the solution using No.40 quantitative filter paper through a funnel & wash the precipitate with hot water several times to remove chloride ions. 5. Heat the funnel in an aluminium cone till filter is dry. Transfer the filter paper into a previously dried & weighed silica crucible and heat. 6. Transfer the hot silica crucible into desiccators and cool it. Weigh the crucible along with the precipitate of BaSO4. 7. Repeat the process of heating, cooling and drying till a constant weight is obtained.	1mark 1mark 1mark 1mark 1mark
(b)	**Explain the softening of water by ion exchange process**	**5Marks**
	In this method all the ions present in water are removed. In this insoluble ion exchange resins are used. Resins means it is a long chain organic polymer with functional groups. Depending upon the functional groups attached to resins they are classified into 1. Cation Exchange Resin: These resins exchange its H^+ ions with cations of water sample. Generally it is expressed as RH^+ 2. Anion Exchange Resin: These resins exchange its OH^- ions with anions of water sample. Generally it is expressed as ROH^- Working: The ion exchange resin contains two compartments. One is cation exchange resin and another is anion exchange resin. For the regeneration of respective resins, acid and alkali regeneration units are connected to compartments. The schematic diagram of ion exchange unit as shown in fig. The water sample containing high minerals are first allowed to pass through cation exchange resins, which exchanges its H^+ ions with Ca^{2+} ions of water .i.e $2RH^+ + Ca^{2+} \; R_2Ca^{2+} + 2H^+$ Now the water sample is free from cations. The same water is further allowed to pass through anion exchange resin, which exchanges its OH^- ions with Cl^- of water. i.e. $ROH^- + Cl^- \; RCl^- + OH^-$ Now the water is totally free from all the ions. Now H^+ ions formed at cation exchange resin and OH^- ions formed at anion exchange resin will combine to form pure water. H+ + OH- H2O	1mark 3mark 1mark
(c)	Explain the sources and ill effects and control of ozone layer depletion.	**5Marks**
	Ozone layer depletion is the gradual thinning of the earth's ozone layer in the upper atmosphere caused due to the release of chemical compounds containing gaseous bromine or chlorine from industries or other human activities." Sources: Chlorofluorocarbons, Unregulated Rocket Launches Nitrogenous Compounds, Natural Causes Ill effects: it has,	1mark 1mark 1mark

	Effects on Human Health and Animal Health Effects on Aquatic Ecosystems Effects on Air Quality Effects on Materials Controling: Avoid Using ODS Reduce the use of ozone depleting substances. E.g. avoid the use of CFCs in refrigerators and air conditioners, replacing the halon based fire extinguishers, etc. Minimise the Use of Vehicles The vehicles emit a large amount of greenhouse gases that lead to global warming as well as ozone depletion	1mark 1mark
2.(a)	**What is desalination of water? explain reverse osmosis process.**	5 marks
	The process of removal of dissolved salts from sea water to the extent that water becomes usable is described as desalination. -The principle of osmosis is that water flows from lower concentration to higher concentration side through semi permeable membrane. If the pressure is applied on solution side, the solvent will flow in the reverse direction. This is called reverse osmosis. It is studied that sea water exerts an osmotic pressure of about 4500-5500 KPa. In reverse osmosis, hydrostatic pressure which is greater than osmotic pressure is applied on the salt solution side then water flows from salt solution to fresh water side. This water can be used for human consumption.  Applied pressure Pure water More concentrated solution Less concentrated solution Semipermeable membrane Reverse Osmosis	1 1 1 1 1
(b)	**Explain the sources and ill effects and control of CO air pollution.**	**5Marks**
	CO is found in fumes produced any time you burn fuel in cars or trucks, small engines, stoves, lanterns, grills, fireplaces, gas ranges, or furnaces. CO can build up indoors and poison people and animals who breathe it. The most common symptoms of CO poisoning are headache, dizziness, weakness, upset stomach, vomiting, chest pain, and confusion. CO symptoms are often described as “flu-like.” If you breathe in a lot of CO it can make you pass out or kill you. People who are sleeping or drunk can die from CO poisoning before they have symptoms. Limited burning of charcoal indoors. Burning charcoal – red, gray, black, or white – gives off CO. Do not use portable flameless chemical heaters indoors. Check or changing the batteries in CO detector every six months.	1mark 2mark 1mark 1mark
(C)	Explain the boiler corrosion due to dissolved oxygen carbon monoxide and $MgCl_2$.	**5Marks**
	The decay of boiler material due to the presence of impurities in boiler feed water is called boiler corrosion. **Causes for Boiler corrosion:** 1. Corrosion due to dissolved Oxygen: When water containing dissolved oxygen is heated in the boiler, the free gas is evolved under high pressure of the boiler and attacks the boiler material and forms the rust. 2. Corrosion due to dissolved carbon dioxide: The CO_2 is obtained from the decomposition of bicarbonates. So formed CO_2 is react with H_2O and produce carbonic acid. This carbonic acid is slightly acid and corrosive in nature. 3. Corrosion due to $MgCl_2$: The salts like $MgCl_2$ in boiler feed water forms hydroxides and acid. The acid so formed will	1 1 1 1 1

	attack the boiler parts and causes corrosion.	
3.(a)	Explain the theory instrumentation and appication of flame photometry.	**5Marks**
	Elements impart characteristic color with Bunsen flame. The flame photometry is based on the measurement of intensity of the light emitted when a metal is introduced into a flame. The intensity of the emitted light tells about the concentration of the element present. **Theory:** A photoelectric flame photometer is a device used in inorganic chemical analysis to determine the concentration of certain metal ions, among them sodium, potassium, lithium, and calcium that are easily excited to higher energy levels at a relatively low temperature flame. The excited metal atoms are not stable and they return to ground state by emitting radiation that is proportional to the concentration of metal ions in solution an di measured by flame photometer. **Instrumentation:** It consist of **Source of flame:** A Burner in the flame photometer is the source of flame. It can be maintained in at a constant temperature. **Optical system:** The optical system consists of convex mirror and convex lens. The convex mirror transmits the light emitted from the atoms. Convex mirror also helps to focus the emissions to the lens. The lens helps to focus the light on a point or slit. **Filters:** The reflections from the mirror pass through the slit and reach the filters. Filters will isolate the wavelength to be measured from that of irrelevant emissions. **Photo-detector:** The intensity of radiation emitted by the flame is measured by photo detector. Here the emitted radiation is converted to an electrical signal with the help of photo detector. These electrical signals are directly proportional to the intensity of light. Application: It is used in the quantitative determination of metals in solution, especially alkali & alkaline earth in the given sample.	1mark 1mark 1mark 1mark 1mark
(b)	Explain the titration curve for mixture of strong and weak acid with strong base.	**5Marks**
	HCl, CH_3COOH v/s NaOH the strong acid like HCl is titrated against a strong base such as NaOH, the conductance first decreases due to  replacement of fast moving H^+ ions by slow moving Na^+ ions HCl + NaOH NaCl + H_2O The weak acid do not get neutralized initially because of the well known common ion effect. In the presence of excess of H^+ ions, the ionization of the weak acid is suppressed and hence, weak acid like CH_3COOH ionizes gradually after the first end point and the available H^+ ions are neutralized giving the second end point. Because of common ion effect dissolution of acetic acid is suppressed. Hence it does not provide H^+ ions which required for neutralization. After the neutralization point of HCl, CH_3COOH, conductivity rapidly rises with further addition of NaOH because of continuous addition of fast moving OH^- ions. A plot of conductance against the volume of base added is shown in the figure. The point of intersection of two curves gives the neutralization point.	1mark 1mark 1mark 1mark 1mark

c)	**Explain the properties and application of Graphene?**	**5Marks**
	Properties: • Very high electrical conductivity when exposed to an electric field. • The strongest material ever measured. Up to 150 times stronger than the equivalent weight of steel . • Graphene oxide reportedly has the ability to attract radioactive material. • Graphene has the ability to transmit up to 98% of light. • It absorption of light across the visible and near-infrared parts of the spectrum **Applications:** It is used in touch screens, transistors, super capacitors, sensors, batteries, computer chips, water filters, solar cells etc..,	1 1 1 1 1
4. a)	**Explain the theory, instrumentation and applications of colorimetry?**	**5Marks**
	Theory: Theory of the colorimeter is explained by Beer – Lambertz Law. When a monochromatic light is passed through a solution, a part of light is absorbed by the solution. The absorbance depends on the concentration of the solution and the path length of the light through the solution. Beer-Lambert's law: Absorbance is directly proportional to concentration and thickness. $A = \epsilon ct$ ϵ = molar absorption co-efficient A = Absorbance of light T = Path length C = Concentration of the solution **Instrumentation**: The instruments is used to measure the absorbance of a solution is called photoelectric colorimeter. It consists of **Source:** tungsten bulb or lamp is used as a light source. **Filter:** It is a device to provide desired wavelength range **Sample cell:** sample is hold in glass cell. **Photocell:** Converts the emitted light into electrical signal. When light is allowed to fall on the sample cell at particular wavelength. The blank solution is taken in the sample cell and placed in the path of light beam. Its absorbance is adjusted to zero. Then the analyte solution I placed in the path of light and its absorbance is measured. A plotof absorbance against standard concentrations of analyte is used to find the unknown concentration of analyte in the samples.  Light source Filter Sample cell (cuvette) Photocell Recorder **Applications:** • • In quantitative analysis: large number of metal ions, anions and cations compounds can be determined by in this method • • Photometric Titration i.e. equivalence point can also be determined • • Determination of the composition of colored complex	1 1 1 1 1
b)	**Explain the synthesis of nano materials by chemical vapour deposition method.**	**5Marks**
	Principle: the process involved is conversion of precursor (metal organic compound) into vapors in reduced pressure atmosphere. Processes: the precursor (starting material) is vaporized in a bubble and mixed with inert gas like helium to carry vapors into heating furnace. Condensation reaction takes place in heating furnace at a particular temperature. The product formed after the condensation process is in the form of clusters. The clusters are then condensed into nano particles in a cold finger which are removed by scraping. Advantages: ➢ Simple technique and does not require high vacuum ➢ It is possible to deposit nano materials with almost any shape and size. The byproducts are	1 1 1 1 1

	removed to gas phase. Therefore the product obtained is pure.	
c)	**Write a note on Fullerenes. Mention its applications**	**5Mar**
	A fullerene is any molecule composed of carbon in the form of a hollow sphere, ellipsoid, tube, and many other shapes. Spherical fullerenes are also called bucky balls, and they resemble the balls used in football (soccer). Cylindrical ones are called carbon nanotubes or bucky tubes. Fullerenes are similar in structure to graphite, which is composed of stacked graphene sheets of linked hexagonal rings, but they may also contain pentagonal (or sometimes heptagonal) rings. **Structure of C60 Fullerene** Contains 60 carbon atoms 12 Pentagon rings and 20 Hexagon rings Each pentagon ring is surrounded by 5 hexagon rings Each Hexagon ring is surrounded by 3 hexagon rings and 3 pentagon rings 	**1** **1** **1** **1** **1**
	Applications of Fullerenes 1) Polymer composite of C60 molecule is used in making organic photovolatic cells. 2) Fullerenes have been extensively used for several biomedical applications including the design of high-performance MRI contrast agents, 3) X-Ray imaging contrast agents, 4) Photodynamic therapy, drug and gene delivery.	

PRINCIPAL
SIET., TUMAKURU.

Shridevi Institute of Engineering and Technology, Tumkur-06

I Semester: I-Internal Assessment Test: October-2018

18PHY12-Engineering Physics

Time: 75 Min **Max. Marks: 30**

Note: ***Answer any two full questions.***

1 a. Derive the expression for energy Eigen value for an electron in a potential well of infinite depth. **05 marks**

b. Set up time independent Schrodinger wave equation in one dimension. **06 marks**

c. Write the properties of wave function. **04 marks**

OR

2 a. State Heisenberg's Uncertainity Principle. Using Uncertainity principle Explain non existence of electron in the nucleus. **06 marks**

b. Obtain an expression for energy density of radiation under equilibrium condition in terms of Einstein's co-efficient. **05 marks**

c. An electron is bound in an one dimensional potential well of width 1Å, but if infinite wall height. Find its energy values in the ground state, and also in the first excited states. 0.6024×10^{-17} $0.3760 \times 10^{+2}$ eV , $E_1 = 152.4$ eV. **04 marks**

H.O.D
Dept. of Physics
S.I.E.T., TUMKUR -6.

PRINCIPAL
SIET., TUMAKURU.

PTO

3 a. Describe the construction of the CO_2 laser and explain its working with the help of energy level diagram. **06 marks**

b. Define Fermi factor & Discuss the variation of Fermi factor with Temperature and effect on occupancy of energy levels. **05 marks**

c. A laser beam with power per pulse is 1mW lasts 10ns, if the number of photons emitted per pulse is 3.941×10^7, calculate the wavelength of laser. **04 marks**

OR

4 a. Explain the Success of Quantum free electron theory. **06 marks**

b. Derive the expression for Fermi energy at zero Kelvin. **05 Marks**

c. Calculate the probability of an electron occupying an energy level 0.02eV above the Fermi level at 200K and 400K. 0.24 , 0.36 **04 marks**

Shridevi Institute of Engineering and Technology, Tumkur-06

I Semester: II-Internal Assessment Test: ~~December~~ october-2018

18PHY12-Engineering Physics

Time: 75 Min **Max. Marks: 30**

SCHEME OF EVALUATION

Question No.		Solution	Marks allotted
1	a	Figure + conditions, $\frac{d^2\psi}{dx^2} + \frac{8\pi^2 m}{h^2}(E-V_0)\psi = 0$ upto $E = \frac{n^2h^2}{8ma^2}$	02 03
	b	$\lambda = h/p$, $\frac{d^2\psi}{dx^2} = \frac{1}{v^2}\frac{d^2\psi}{dt^2}$, $\frac{d^2\psi}{dx^2} + \frac{8\pi^2 m}{h^2}(E-V)\psi = 0$	06
	c	mention four properties of wave function	1+1+1+1
2	a	Statement, $\Delta x \Delta p_x \geq \left(\frac{h}{4\pi}\right)$ upto $E \geq 20.6$ MeV	02 04
	b	Rate of absorption $= B_{12}N_1U_\nu$, rate of spontaneous emission $= A_{21}N_2$, ll^ly $B_{21}N_2U_\nu$, $U_\nu = \frac{A}{E\,e^{h\nu/kT}+1}$	03 02
	c	$E = \frac{n^2h^2}{8ma^2}$, $E_0 = 37.6\,eV$, $E_1 = 150.4\,eV$	01 03
3	a	Construction and Explanation Explanation of working with energy level diagram	03 03
	b	Definition, $f(E) = \frac{1}{e^{(E-E_F)/kT}+1}$ $E<E_F$, $f(E)=1$, $E>E_F$, $f(E)=0$, $f(E)=1/2$ $(E=E_F)$	01 04
	c	$\Delta E = 2.5374 \times 10^{-9}$ [illegible], $\lambda = \frac{hc}{P}$, $\lambda = 7835\,Å$	04
4	a	Explanation of Specific heat, σ(T) and σ on n	02+02+02
	b	$N(E)dE = g(E)dE \times f(E)$ $E_{F0} = \left(\frac{h^2}{8m}\right)\left(\frac{3n}{\pi}\right)^{2/3}$	01 04
	c	$f(E) = \frac{1}{e^{(E-E_F)/kT}+1}$, $f(E) = 0.24$ $f(E) = 0.36$	01 03

H.O.D
Dept. of Physics
S.I.E.T., TUMKUR -6.

PRINCIPAL
SIET., TUMAKURU.

Shridevi Institute of Engineering and Technology, Tumkur-06

I Semester: III-Internal Assessment Test: January-2019

18PHY12-Engineering Physics

Time: 75 Min **Max. Marks: 30**

Note: ***Answer any two full questions.***

1 a. Obtained the relation between shearing strain, elongation strain and compression strain. **06 marks**

b. Derive the expression for bending moment in terms moment of inertia. **06 marks**

c. Explain brief the factor affecting elastic property of a body. **03 marks**

OR

2 a. Derive the relation between bulk modulus (K) , Young's modulus (Y) and Poisson's ration (σ). **05 marks**

b. Derive the expression for the depression and Y at the free end of a beam of loaded cantilever. **06 marks**

c. Explain stress-strain diagram. **04 marks**

H.O.D
Dept. of Physics
S.I.E.T., TUMKUR -6.

PRINCIPAL
SIET., TUMAKURU.

3 a. State and prove the Gauss divergence theorem. **06 marks**

b. With a neat diagram derive an expression for numerical aperture and arrive at the condition for propagation. **06 marks**

c. Mention the conditions for three types of polarization of electric vector. **03 marks**

OR

4 a. Derive the EM wave equation in terms of electric field using Maxwell's equation. **05 marks**

b. With neat diagrams explain the different types of optical fibers. **06 Marks**

c. Give the four Maxwell's equations in time varying condition. **04 marks**

Shridevi Institute of Engineering and Technology, Tumkur-06

I Semester: III Internal Assessment Test: ~~October-2018~~ January-2019
18PHY12-Engineering Physics

Time: 75 Min

Max. Marks: 30

SCHEME OF EVALUATION

Question No.		Solution	Marks allotted
1	a	figure + Explonation Derivation up to $\frac{\theta}{2}+\frac{\theta}{2}=\theta$	02 04
	b	Figure + Explonation Linear strain $=\frac{x}{R}$ + Stress $=\frac{F}{a}$, $BM=\frac{Y}{R}\Sigma a x^2$	02 04
	c	Effect of Stress and temperature annealing Effect of impurities on elasticity	01 01 01
2	a	Figure + Explanation $K=\frac{Y}{3(1-2\sigma)}$ $(\because \sigma=\beta/\alpha)$	02 03
	b	Figure + Explanation upto $y_0=\frac{WL^3}{3YI_g}$	02 04
	c	Figure Explanation	01 03
3	a	Statement $\oint_S \vec{D}\cdot\vec{ds}=\int_V \nabla\cdot\vec{D}\,dv$	02 04
	b	Figure upto N.A $=\sqrt{n_1^2-n_2^2}$ $\sin\theta_i < N.A$	01 04 01
	c	$E_y=\left(\frac{E_2}{E_1}\right)E_x$, $\left(\frac{E_x}{E_1}\right)^2+\left(\frac{E_y}{E_2}\right)^2=1$ $E_x^2+E_y^2=E_1^2$	03
4	a	Derivation up to $\nabla^2\vec{E}-\mu\epsilon\frac{\partial^2\vec{E}}{\partial t^2}=\mu\frac{\partial\vec{J}}{\partial t}+\nabla\left(\frac{\rho_v}{\epsilon}\right)$	05
	b	diagram and Explonation of three types of optical fibers	2+2+2
	c	$\nabla\cdot\vec{D}=\rho_v$, $\nabla\times\vec{E}=-\frac{\partial\vec{B}}{\partial t}$, $\nabla\cdot\vec{B}=0$ $\nabla\times E=\vec{J}+\frac{\partial\vec{D}}{\partial t}$	01+1+1+1

H.O.D
Dept. of Physics
S.I.E.T., TUMKUR -6.

PRINCIPAL
SIET., TUMAKURU.

Shridevi Institute of Engineering and Technology, Tumkur-06

II Semester: I-Internal Assessment Test: April-2019

18PHY22-Engineering Physics

Time: 75 Min **Max. Marks: 30**

Note: ***Answer any two full questions.***

1 a. With a neat diagram explain the construction and working of Reddy shock tube. **06Marks**

b. Define SHM. Mention the characteristics of SHM. **05 Marks**

c. A free particle is executing simple harmonic motion in a straight line with a period of 25 seconds, 5 seconds after it has crossed the equilibrium point, the velocity is found to be 0.7 m/s. Find the displacement at the end of 10 seconds and also amplitude of oscillations. **04 Marks**

OR

2 a. Discuss the theory of forced vibrations and hence obtain the expression for amplitude and Phase. **06 Marks**

b. What are damped oscillations. Give the theory of damped oscillations. **06 Marks**

c. Mention the applications of shock waves. **03 Marks**

H.O.D
Dept. of Physics
S.I.E.T., TUMKUR -6.

PRINCIPAL
SIET., TUMAKURU.

3 a. Derive the Expression for couple per unit twist of a solid cylinder. **06 Marks**

b. Derive the expression for bending moment in terms moment of inertia. **06 Marks**

c. Calculate the force required to produce an extension of 1mm in steel wire of length 2m and diameter 1mm. ($Y = 2 \times 10^{11}$ N/m^2) **03 Marks**

OR

4 a. Derive the relation between bulk modulus (K) , Young's modulus (Y) and Poisson's ration (σ). **05 Marks**

b. Derive the expression for the depression and Y at the free end of a beam of loaded cantilever. **06 Marks**

c. Explain stress-strain diagram. **04 Marks**

Shridevi Institute of Engineering and Technology, Tumkur-06

II Semester: I-Internal Assessment Test: April-2019

Scheme and Solution

Subject: Engineering Physics **Subject Code: 18PHY22**

Question No.		Solution	Marks allotted
1	a	Figure —— 2 Explanation of construction —— 2 Explanation of working —— 2	06
	b	Defenition —— 1 Mention any four characteristics of Simple Harmonic Motion —— 4	05
	c	$x = a\sin\omega t$ —— 1 Substitution $a = 9.06\,m$ $x = 5.3\,m$ —— 3	04
2	a	$m\frac{d^2x}{dt^2} = -r\frac{dx}{dt} - kx + F\sin(pt)$ — 2 $x = a\sin(pt-\alpha)$ — 1, $\frac{F}{m}\sin[(pt-\alpha)+\alpha]$ — 1 $a = \frac{F/m}{\sqrt{4b^2p^2+(\omega^2-p^2)^2}}$ — 1, $\alpha = \tan^{-1}\left[\frac{2bp}{\omega^2-p^2}\right]$ — 1	06
	b	Defenition — 1, $m\frac{d^2x}{dt^2} = -r\frac{dx}{dt} - kx$ — 2 $x = Ae^{\alpha t}$ — 1, $\cancel{\alpha}\ \alpha^2+2b\alpha+\omega^2=0$ — 1 $x = e^{-bt}\left[(C+D) + (C-D)Et\right]$ — 1	06
	c	Any three application of shock waves	03

3	a	Figure and Explanation — 1 $L\phi = r\theta$ or $\phi = \frac{r\theta}{L}$ — 1 $F = T(2\pi r\,dr)$ — 1, $OO' = \frac{2\pi n\theta}{L} r^3 dr$ — 1 Twisting couple = $\frac{\pi n R^4 \theta}{2L}$ — 1, $C = \left(\frac{\pi n R^4}{2L}\right)$ — 1	06
	b	Figure and Explanation — 1, $CD = R\theta$ — 1, Linear strain = $\frac{x}{R}$ — 1, Longitudinal stress = $Y\left(\frac{x}{R}\right)$ — 1 Moment of force = $\frac{Y}{R}\sum a x^2$ — 1, $= \frac{Y}{R} I_g$ — 1	06
	c	$Y = \frac{FL}{ax}$ — 1 Substitution, $F = 78.54\,N$ — 2	03
4	a	Figure and Explanation — 1 New volume = $1(\alpha - 2\beta)3T$ — 1 Volume strain = $\frac{3P(\alpha - 3\beta)}{1}$ — 1 Bulk modulus $K = \frac{\text{pressure}}{\text{volume strain}}$ — 1, $K = \frac{Y}{3(1-2\sigma)}$ — 1	05
	b	Figure and Explanation — 1, Bending moment = $W(L-x)$ — 1, $d\left(\frac{dy}{dx}\right) = \frac{W}{YI_g}(L\,dx - x\,dx)$ — 1, $\frac{dy}{dx} = \frac{W}{YI_g}\left[Lx - \frac{x^2}{2}\right] + C_1$ — 1, $y = \frac{W}{YI_g}\left(\frac{Lx^2}{2} - \frac{x^3}{6}\right) + C_2$ — 1, $y = \frac{4WL^3}{Ybd^3}$ — 1	06
	c	Figure — 1 Explanation — 3	04

H.O.D
Dept. of Physics
S.I.E.T., TUMKUR -6.

PRINCIPAL
SIET., TUMAKURU

Shridevi Institute of Engineering and Technology, Tumkur-06

II Semester: II-Internal Assessment Test: May-2019

18PHY22-Engineering Physics

Time: 75 Min **Max. Marks: 30**

Note: ***Answer any two full questions.***

1 a. Derive the expression for energy Eigen value for an electron in a potential well of infinite depth. **05 marks**

b. Set up time independent Schrodinger wave equation in one dimension. **06 marks**

c. A particle of mass 940 MeV/c^2 has a kinetic energy 0.5 KeV. Find the de-Broglie wavelength. (c is the velocity of light). **04 Marks**

OR

2 a. State Heisenberg's Uncertainity Principle. Using Uncertainity principle Explain non existence of electron in the nucleus. **06 marks**

b. Obtain an expression for energy density of radiation under equilibrium condition in terms of Einstein's co-efficient. **05 marks**

c. An electron is bound in an one dimensional potential well of width 1Å, but if infinite wall height. Find its energy values in the ground state, and also in the first excited states. **04 marks**

$E_1 = 37.60$ eV $E_2 = 150.41$ eV

Dept. of Physics
S.I.E.T., TUMKUR -6.

PRINCIPAL
SIET., TUMAKURU.

3 a. Describe the construction of the CO_2 laser and explain its working with the help of energy level diagram. **07 marks**

b. Write the properties of wave function. **04 marks**

c. The ratio of population of two energy levels is 1.059×10^{-30}. Find the wavelength of light at 330K. $\lambda = 6324 Å$ **04 marks**

OR

4 a. Describe construction and working of a semiconductor laser. **06 marks**

b. Discuss the requisites and the condition for a laser system. **05 marks**

c. A medium in thermal equilibrium at temperature 300K has two energy levels with a wavelength separation of 1 μm. Find the ratio of population densities of the upper and lower levels. $\frac{N_2}{N_1} = 1.404 \times 10^{-21}$ **04 marks**

Shridevi Institute of Engineering and Technology, Tumkur-06

II Semester: II-Internal Assessment Test: May-2019

Scheme and Solution

Subject: Engineering Physics **Subject Code: 18PHY22**

Question No.		Solution	Marks allotted
1	a	Figure and Explanation — 1, $\frac{d^2\psi}{dx^2}+\frac{8\pi^2m}{h^2}E\psi=0$ — 1 upto $\frac{d^2\psi}{dx^2}+k^2\psi=0$ — 1, $\psi=A\cos kx+B\sin kx$ — 1 $E_n=\frac{n^2h^2}{8ma^2}$ — 1, ~~$\psi_n=\sqrt{\frac{2}{a}}\sin\frac{n\pi x}{a}$ — 1~~	05
	b	$\lambda=\frac{h}{p}$ — 1, $\psi=Ae^{i(kx-\omega t)}$ — 1 upto $\frac{1}{\lambda^2}=-\frac{1}{4\pi^2\psi}\frac{d^2\psi}{dx^2}$ — 2 $K.E=-\frac{h^2}{8\pi^2m}\frac{1}{\psi}\frac{d^2\psi}{dx^2}$ — 1 $\frac{d^2\psi}{dx^2}+\frac{8\pi^2m}{h^2}(E-V)\psi=0$ — 1	06
	c	$m=1.6732\times10^{-27}$ kg — 1 $E=8.01\times10^{-19}$ J — 1 $\lambda=\frac{h}{\sqrt{2mE}}$ — 1, $\lambda=1.27$ pm — 1	04
2	a	Statement — 1, $E=\frac{m_oc^2}{\sqrt{1-\frac{v^2}{c^2}}}$ and $p=\frac{m_ov}{\sqrt{1-\frac{v^2}{c^2}}}$ upto $E^2=p^2c^2+m_o^2c^4$ — 1, $\Delta x\Delta p\geq\frac{h}{4\pi}$ — 1 $\Delta x\leq5\times10^{-15}$ m upto $\Delta p\geq1.1\times10^{-20}$ Ns — 1, $E\geq20.6$ MeV — 1 conclusion — 1	06
	b	upto $B_{12}N_1U_\nu=A_{21}N_2+B_{21}N_2U_\nu$ — 2 $U_\nu=\frac{A_{21}}{B_{21}}\left[\frac{1}{\frac{B_{12}}{B_{21}}\frac{N_1}{N_2}-1}\right]$ — 1, $\frac{N_2}{N_1}=e^{-\frac{h\nu}{kT}}$ — 1 $U_\nu=\frac{A}{B(e^{\frac{h\nu}{kT}}-1)}$ — 1, $U_\nu=\frac{8\pi h\nu^3}{c^3}\left(\frac{1}{e^{\frac{h\nu}{kT}}-1}\right)$	05
	c	$E_n=\frac{n^2h^2}{8ma^2}$ — 1, substitution — 1 $E_1=37.60$ eV — 1, $E_2=150.41$ eV — 1	04

H.C.
Dept. of Physics
S.I.E.T., TUMKUR -6.

PRINCIPAL
SIET., TUMAKURU.

3	a	Figure —— 1 Explanation of construction —— 3 Explanation of working with energy level diagram —— 3	07
	b	write four properties of wave function } — 4	04
	c	$\frac{N_2}{N_1} = e^{-\frac{hc}{\lambda kT}}$ — 1, $\lambda = -\frac{hc}{\ln(\frac{N_2}{N_1})kT}$ — 1 Substitution, $\lambda = 6324\,Å$ —— 2	04
4	a	figure, Explanation of construction — 3 working with energy level diagram — 3	06
	b	Explanation of Excitation source — 1 Active medium — 1, Laser cavity — 1 Explanation of population inversion — 2	05
	c	$\frac{N_2}{N_1} = e^{-\frac{hc}{\lambda kT}}$ — 1 Substitution, $\frac{N_2}{N_1} = 1.404 \times 10^{-21}$ — 3	04

Shridevi Institute of Engineering and Technology, Tumkur-06

II Semester: III-Internal Assessment Test: June-2019

18PHY22-Engineering Physics

Time: 75 Min **Max. Marks: 30**

Note: ***Answer any two full questions.***

1 a. Explain the merits of QFET. **06 marks**

b. Derive Clausius- Mossotti equation. **05 marks**

c. Find the temperature of which there is 1% probability that a state with an energy 0.5eV. **04 marks**

OR

2 a. Derive an expression for Fermi energy at zero Kelvin for a metal. **05 marks**

b. What-is-Hall Effect? Obtain the expression for Hall voltage in terms of Hall co-efficient. **06 marks**

c. The electron concentration in a semiconductor is 5×10^{17} m^{-3}. Calculate the conductivity of the material if the drift velocity of electron is 350 ms^{-1} in an electric field of 1000 Vm^{-1} **04 marks**

H.O.D
Dept. of Physics
S.I.E.T., TUMKUR -6.

PRINCIPAL
SIET., TUMAKURU

3 a. State and prove the Gauss divergence theorem. **05 marks**

b. With a neat diagram derive an expression for numerical aperture and arrive at the condition for propagation. **06 marks**

c. The refractive indices of core and clad are 1.50 and 1.48 respectively in an optical fiber. find the numerical aperture and angle of acceptance. **04 marks**

OR

4 a. Derive the EM wave equation in terms of electric field using Maxwell's equation. **05 marks**

b. With neat diagrams explain the different types of optical fibers. **06 Marks**

c. Explain the types of fiber losses. **04 marks**

Shridevi Institute of Engineering and Technology, Tumkur-06

II Semester: III-Internal Assessment Test: June-2019

Scheme and Solution

Subject: Engineering Physics **Subject Code: 18PHY22**

Question No.		Solution	Marks allotted
1	a	Explanation of the merits of QFET * Specific heat —— 02 * Temperature dependence —— 02 * Electron concentration —— 02	06
	b	$\mu = \alpha_e E_i$ —— 01 $P = N\alpha_e E_i$ $E = \frac{P}{\epsilon_0(\epsilon_r - 1)}$ —— 01 $E_i = E + \gamma P/\epsilon_0$ —— 01 $\frac{1}{N\alpha_e} = \frac{1}{\epsilon_0}\left[\frac{1}{(\epsilon_r-1)} + \gamma\right]$, $\frac{(\epsilon_r-1)}{(\epsilon_r+2)} = \frac{N\alpha_e}{3\epsilon_0}$ —— 02	05
	c	$f(E) = \frac{1}{e^{\frac{E-E_F}{kT}} + 1}$ ← (01), Substitution — (02) $T = 1261.K$ —— 01	04
2	a	$n(E)\,dE = g(E)\,dE \times f(E)$ —— 01 upto $E_{F0} = \left(\frac{h^2}{8m}\right)\left(\frac{3n}{\pi}\right)^{2/3}$ —— 04	05
	b	Definition — 01, Figure —— 01 upto $V_H = R_H\left(\frac{BI}{w}\right)$ —— 04	06
	c	$\sigma_n = ne\mu_e$ —— 01 Substitution —— 01 upto $\sigma_n = 0.028/\Omega m$ —— 02	04

Dept. of Physics
S.I.E.T., TUMKUR -6.

PRINCIPAL
SIET., TUMAKURU.

3	a	Statement with figure — 02 upto $\oint \vec{D} \cdot \vec{ds} = \int_V \nabla \cdot \vec{D}\, dv$ — 04	06
	b	Figure — 01 upto $N.A = \sqrt{n_1^2 - n_2^2}$ — 04 $\sin\theta_i < N.A$ — 01	06
	c	Mention the three Condition of polarization 1×3	03
4	a	Derivation upto $\nabla^2\vec{E} - \mu\varepsilon\frac{\partial^2\vec{E}}{\partial t^2} = \mu\frac{\partial\vec{J}}{\partial t} + \nabla\left(\frac{\rho_v}{\varepsilon}\right)$	05
	b	Explanation of three types of optical fibres 3×2	06
	c	Figures — 01 Explanation of three types of losses — 03	04

20 copies

SHRIDEVI
EDUCATION

FS 543667
An ISO 9001:2015 Certified In

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An ISO 9001-2015 Certified Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19
II INTERNAL ASSESSMENT TEST
SUBJECT: Digital Electronics

Time:75 minutes **Max Marks:30M**
Sub Code:17EC34 **Semester:III**
Date:30/10/2018 **Note: Answer any one question from each module**

Module-II

1) A) Implement $f(a,b,c,d) = \Sigma m(0,1,5,6,7,10,15)$ using
   - i) 8:1 MUX with a, b, c as select lines
   - ii) 4:1 MUX with a, b as select lines — 8M

   B) What is the problem associated with the parallel adder? Explain the method of correcting it using carry look ahead adder with suitable circuit and equations. — 7M

or

2) A) Design full adder using i) 8:1 MUX and ii) 4:1 MUX — 5M

   B) What is magnitude comparator? Design a two bit digital comparator by writing truth table, relevant expression and logic diagram. — 10M

Module-III

3) A) Distinguish between sequential circuits and combinational circuits. — 3M

   B) Discuss the difference between a flip flop and latch. Explain the operation of gated SR latch with a logic diagram, truth table and logic symbol. — 7M

   C) Explain the operation of a switch debouncer built using SR latch with the help of Waveforms. — 5M

or

4) A) Implement 4-bit parallel adder/subtractor using 4-full adder blocks. If $C_{in} = 0$ the circuit should act as adder and if $C_{in} = 1$ the circuit should act as subtractor. Explain its operation by considering examples. — 6M

   B) Define multiplexer and demultiplexer and draw block diagram . — 4M

   C) Define bistable element, latch, flip-flop — 3M

   D) Define asynchronous circuit. — 2M

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY, TUMKUR -06
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19(Even semester)

IInd ~~THIRD~~ *INTERNAL ASSESSMENT*

SCHEME & SOLUTION

NAME OF COURSE INSTRUCTOR:	Madhu. B. C
PROGRAMME:	B.E
COURSE TITLE:	Digital Electronics
COURSE CODE:	17EC34
SIGNATURE:	31/10/18

Q.NO	SOLUTION	MARKS
①ⓐ	$f(a,b,c,d) = \Sigma m(0,1,5,6,7,10,15)$	

i) 8:1 MUX

$d_0 = 1$

$d_1 = 0$

$d_2 = d$

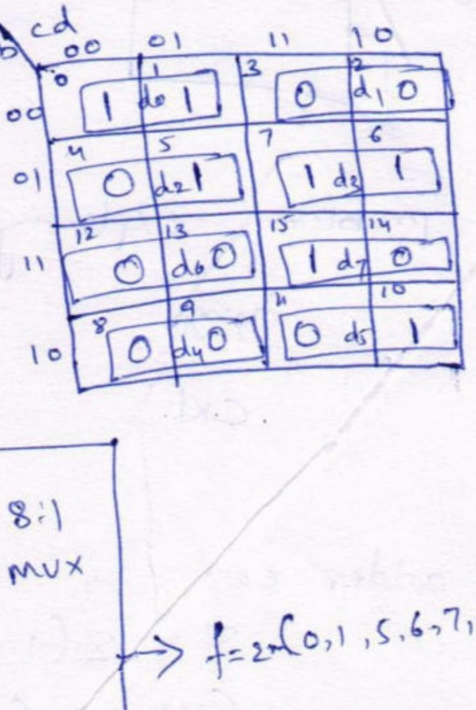
$d_3 = 1$

$d_4 = 0$

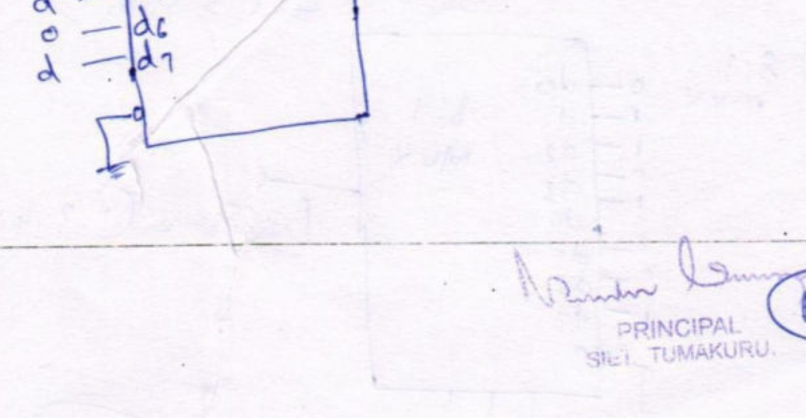
$d_5 = \bar{d}$

$d_6 = 0$

$d_7 = d$



4M



PRINCIPAL
SIET, TUMAKURU.

ii) $f(a,b,c,d) = \Sigma m(0,1,5,6,7,10,15)$

4:1 MUX

ab \ cd	00	01	11	10	
00	1	1	0	0	d_0
01	0	1	1	1	d_1
11	0	0	1	0	d_3
10	0	0	0	1	d_2

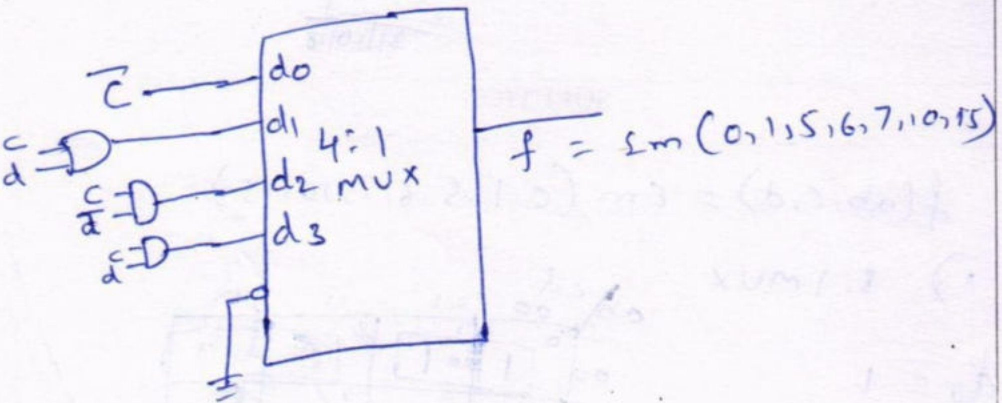
$d_0 = \bar{c}$

$d_1 = c + d$

$d_2 = c\bar{d}$

$d_3 = cd$

4M



ⓑ problem explaining delay → 2M

eqns 3M

ckt 2M

7M

②

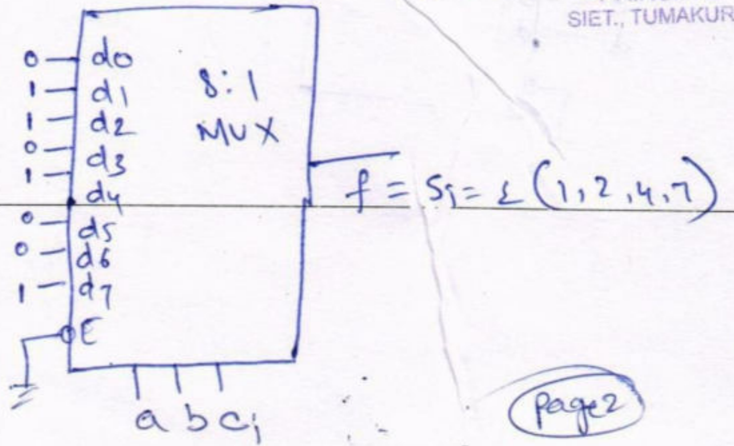
ⓐ Full adder eqns

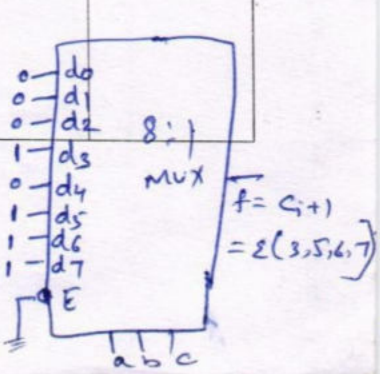
$S_i = \Sigma(1,2,4,7)$

$C_{i+1} = \Sigma(3,5,6,7)$

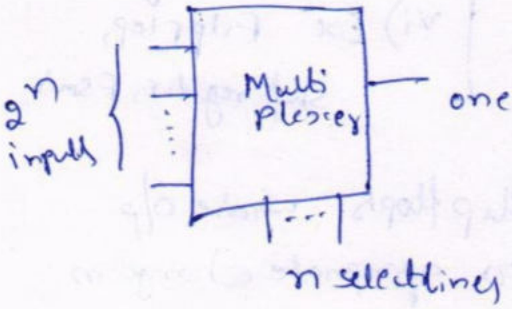
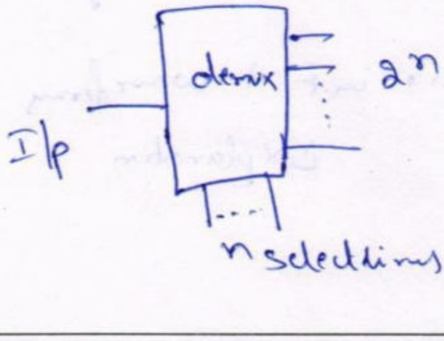
2.5M

(i) 8:1 mux





Q.NO	SOLUTION		MARKS
③ ⓐ	Combinational circuits	Sequential circuits	
	i) The output at any given time dependent only on the inputs at that time	i) output at a given time is dependent on the input at that time as well as previous outputs	
	ii) Dont have memory	ii) Have memory.	Any 3 differences
	iii) Feedback absent	iii) Feedback present	
	(iv) Speed is more	(iv) Less speed	3M
	v) Easy to design	v) Hard to design	
	vi) Ex: Adder, Comparator, MUX, decoder	vi) Ex: FlipFlop, Shift register, FSMs	
(b)	Latch is a class of flip flops whose o/p responds immediately to appropriate changes in the input inspite of presence of clock or enable input.		2M
	~~o/p~~ operation of SR Latch		⑤M
	Logic diagram		-1M
	Truth table		-2M
	Logic symbol		-1M
	Expnation		-1M 7M
ⓒ	Debouncer circuit + waveforms		4M
	Explanation		1M 5M

Q.NO	SOLUTION	MARKS
(4) (a)	Circuit Explanation	4M 2M 6M
(b)	Multiplexers are data selectors, Connects one of its 2^n input lines selected by n-bit select line to its output line. MUX have Enable inputs.  2M A demultiplexer or (demux) is a device that takes a single input line and connects it to one of several output lines. A demux of 2^n outputs has n select lines, which are used to select which output line to connect to the input  2M	4M

Q.NO	SOLUTION	MARKS
④ ⓒ	Each den 1M Bistable element latch flipflop	3M
d)	Asynchronous circuit den	2m

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An ISO 9001-2015 Certified Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19
III INTERNAL ASSESSMENT TEST
SUBJECT: Digital Electronics

FS 543667
An ISO 9001:2015 Certified In

Time:75 minutes | **Max Marks:30M**
Sub Code:17EC34 | **Semester:III**
Date:28/11/2018 | **Note: Answer any one question from each module**

1) A) Explain the operation of master-slave JK flip-flop with logic diagram, truth table, symbol and timing diagram. 8M
B) Derive characteristic equations for i) JK ii) SR flip-flops 4M
C) Distinguish between Mealy or Moore model of sequential circuits. 3M

or

2) A) Explain the operation of 4-bit universal shift register with a neat diagram. 8M
B) Explain the working principle of 4-bit binary ripple counter configured using +ve edge triggered T-FF. Also draw timing diagram. 7M

3) A) Design synchronous mod-6 counter using clocked JK ffs for the sequence 0-2-3-6-5-1-0-2-…..represent application table, excitation table and logic diagram. 8M
B) Explain the operation of 4-bit ring counter and twisted ring counter with logic diagram, logic sequence and decoding logic. 7M

or

4) A) Design the sequential logic circuit for single input single output system shown in fig 4.a, using clocked D ff. 6M

B) Analyze the circuit shown in fig 4.b, obtain state table and state diagram. 9M

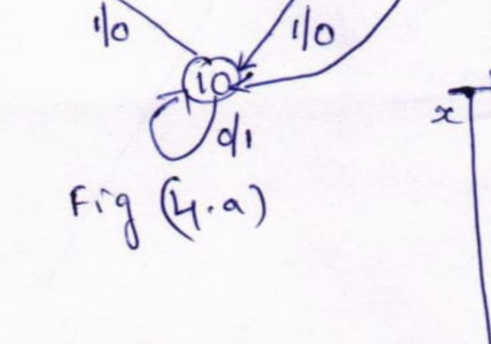


Fig (4.a)

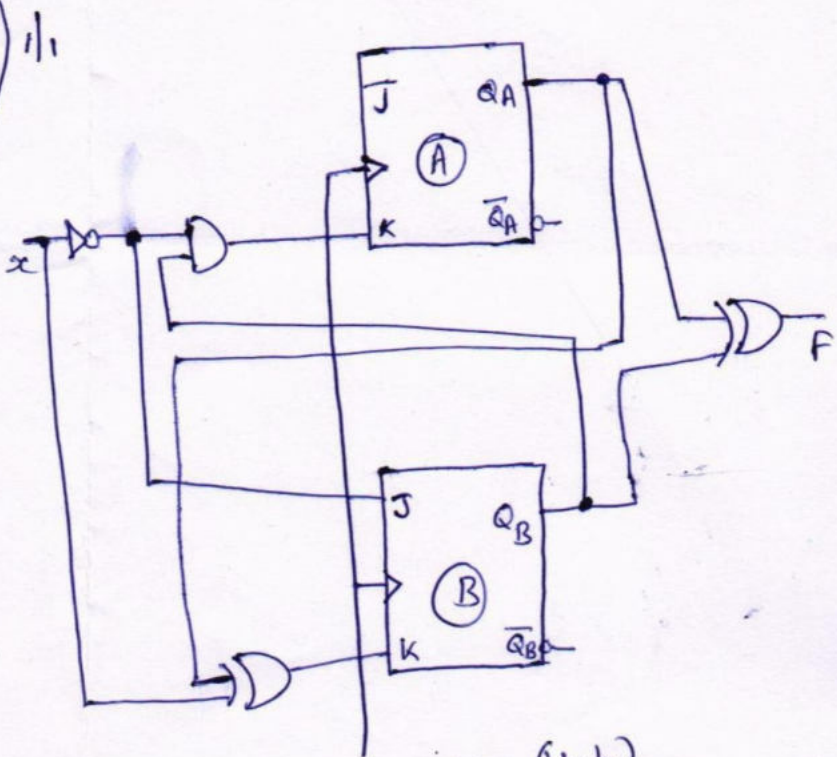


Fig (4.b)

PRINCIPAL
SIET., TUMAKURU.

III Internal Scheme

Staff name : Madhu.B.C Sem - III

Subject : Digital Electronics

1. a. Block diagram - 2 (8M)
Truth Table. - 2
Timing Diagram - 2
Symbol - 2

b. Characteristic Equations for SR FF - 2 (4)
JK FF - 2

(3M)

c. Differences 3 — 3M

2. a. Block diagram - 4 (8M)
Explanation - 4

b. 4-bit Binary Ripple Counter (7M)
Block diagram - 4M
Explanation - 3M

3.a Mod 6 Counter using clocked JK FF (8M)
Application Table - 2
Excitation Table - 2
Logic diagram - 4

PRINCIPAL
SIET., TUMAKURU

(b) 4 bit Ring Counter – 3
Twisted Ring Counter – 3 (7M)
Decoding logic – 1

4.a. Single I/p Single o/p System (6M)
Block diagram – 3
Explanation – 3

b. State table – 4 (9M)
State Diagram – 5

PRINCIPAL
SIET., TUMAKURU.

Sri Shridevi Charitable Trust [R]

Shridevi Institute of Engineering and Technology

DEPARTMENT OF ELECTRONICS & COMMUNICATION

Academic Year -2018-19

3rd INTERNAL ASSESMENT

FS 543667

An ISO 9001:2015 Certified Institution

Sub: Microprocessors **Sub code:17EC46**

Marks: 30 **Time Duration:75Min**

Answer any two full questions from each module

1.a Draw the interrupt vector table and write the sequence of operations that are performed when an interrupt is recognized 7M

b. Write a program to generate a delay of 100ms using an 8086 system that runs on 10MHz frequency. Show the calculations. 8M

OR

2.a. What are the methods used to pass parameters to a procedure? Explain anyone with an example program 8M

b. Write a procedure in 8086 assembly language which compute factorial of a number. 7M

3.a. Write an 8086 ALP to rotate stepper motor in clockwise direction by 360 degrees and anticlockwise by 360 degrees. Assume 1.8 degree step and delay procedure. 7M

b. Differentiate between Hardward and Von- nuemann Architectures and Procedures and Macros 8M

OR

4.a . Write a program to generate triangular wave using DAC 0800 along with schematic. 8M

b. Explain the control word register of 8254 timer 7M

Sri Shridevi Charitable Trust [R]

Shridevi Institute of Engineering and Technology

DEPARTMENT OF ELECTRONICS & COMMUNICATION

Academic Year -2018-19

3rd INTERNAL ASSESMENT

FS 543667

An ISO 9001:2015 Certified Institution

Sub: Microprocessors **Sub code:17EC46**

Marks: 30 **Time Duration:75Min**

Answer any two full questions from each module

1.a Draw the interrupt vector table and write the sequence of operations that are performed when an interrupt is recognized 7M

b. Write a program to generate a delay of 100ms using an 8086 system that runs on 10MHz frequency. Show the calculations. 8M

OR

2.a. What are the methods used to pass parameters to a procedure? Explain anyone with an example program 8M

b. Write a procedure in 8086 assembly language which compute factorial of a number. 7M

3.a. Write an 8086 ALP to rotate stepper motor in clockwise direction by 360 degrees and anticlockwise by 360 degrees. Assume 1.8 degree step and delay procedure. 7M

b. Differentiate between Hardward and Von- nuemann Architectures and Procedures and Macros 8M

OR

4.a . Write a program to generate triangular wave using DAC 0800 along with schematic. 8M

b. Explain the control word register of 8254 timer 7M

PRINCIPAL
SIET., TUMAKURU.

Scheme of Evaluation

NAME OF THE FACULTY:	Haripriya R
DEPARTMENT:	ECE
SUBJECT TITLE:	Microprocessors (3)
SUBJECT CODE:	17EC46
SIGNATURE:	

Q.NO	**SOLUTION**	**MARKS**
1.a.	Interrupt Vector Table – 4M Sequence of operations when an Interrupt is Recognized – 3M	7M
b.	program – 4M Calculation – 4M	8M
2.a	Methods to pass parameters to a procedure – 4M Example program – 4M	8M
b	program to find factorial of a Number – 7M	7M
3.a	ALP to Rotate Stepper Motor in Clockwise direction – 2½M Anticlockwise direction – 2½M	

PRINCIPAL
SIET., TUMAKURU

Q.NO	SOLUTION	MARKS
	Delay Calculation 2M	
3.b	Differences b/w Hardward and Von-Nuemann each difference carry - 2M	8M
4a.	program to generate triangular wave using DAC 0800 — 8M	8M
b.	Control word Register format of 8254-4M Explanation - 3M	(7M)

PRINCIPAL
SIET., TUMAKURU

Sri Shridevi Charitable Trust [R]

Shridevi Institute of Engineering and Technology

DEPARTMENT OF ELECTRONICS & COMMUNICATION

Academic Year -2018-19

An ISO 9001:2015 Certified Institution

2nd INTERNAL ASSESMENT

Sub: Microprocessors **Sub code:17EC46**

Marks: 30 **Time Duration:75Min**

Answer any two full questions from each module

1.a Explain the following instructions
CMPS, SCAS, REPNZ, INTO, HLT, CLD, LOCK 7M

b. With a neat diagram explain the pin diagram of 8086. 8M

OR

2.a. Explain the minimum mode working of 8086 with a neat diagram 8M

b. With a neat timing diagram explain the read cycle and write cycle in maximum mode of 8086 7M

3.a. How the address bus and data bus are derived from system bus 6M

b. Interface 8086 to input port 74LS245 to read the status of 8 switches sw1 to sw8. If the switch is closed it inputs 1 otherwise 0. Consider the address of the port as 0740H 9M

OR

4.a . Explain the modes of operation of 8255 6M

b. Interface 8086 to output port 74LS373 to display the status of 8 switches sw1 to sw8 on a seven segment display. Consider the address of the port as 0008H 9M

Sri Shridevi Charitable Trust [R]

Shridevi Institute of Engineering and Technology

DEPARTMENT OF ELECTRONICS & COMMUNICATION

Academic Year -2018-19

An ISO 9001:2015 Certified Institution

2nd INTERNAL ASSESMENT

Sub: Microprocessors **Sub code:17EC46**

Marks: 30 **Time Duration:75Min**

Answer any two full questions from each module

1.a Explain the following instructions
CMPS, SCAS, REPNZ, INTO, HLT, CLD, LOCK 7M

b. With a neat diagram explain the pin diagram of 8086. 8M

OR

2.a. Explain the minimum mode working of 8086 with a neat diagram 8M

b. With a neat timing diagram explain the read cycle and write cycle in maximum mode of 8086 7M

3.a. How the address bus and data bus are derived from system bus 6M

b. Interface 8086 to input port 74LS245 to read the status of 8 switches sw1 to sw8. If the switch is closed it inputs 1 otherwise 0. Consider the address of the port as 0740H 9M

OR

4.a . Explain the modes of operation of 8255 6M

b. Interface 8086 to output port 74LS373 to display the status of 8 switches sw1 to

PRINCIPAL
SIET, TUMAKURU.

Scheme of Evaluation

NAME OF THE FACULTY:	Haripriya. R
DEPARTMENT:	ECE
SUBJECT TITLE:	~~Ds~~ Microprocessors (2)
SUBJECT CODE:	17EC46
SIGNATURE:	

Q.NO	SOLUTION	MARKS
1. a.	CMPS, SCAS, REPNZ, INTO, HLT, CLD, LOCK – Each Instruction Carry 1 M	7M
b.	Pin diagram – 4M Explanation – 4M	8M
2. a	Diagram – 4 M Explanation – 4 M.	8M
b.	Read Cycle Timing diagram – 3½ Write Cycle Timing diagram – 3½	7M
3. a	Diagram – 3 M Explanation – 3 M	6M
b.	Diagram – 4M program – 5M	9M

PRINCIPAL
SIET., TUMAKURU.

Q.NO	SOLUTION	MARKS
4. a.	Modes of operation of 8255	6M
b.	Interfacing diagram – 4M program – 5M	9M

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An ISO 9001-2015 Certified Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19
II INTERNAL ASSESSMENT TEST
COURSE: VERILOG HDL

Time:75 minutes **Max Marks:30M**
Course Code:15EC53 **Semester:V**
Date:30/10/18

Answer any one question from each module

Module 1

1) a). Mention the gate instantiation of basic gates (and/or gate and not/buf gate). **5M**
b). Write gate level description for 4:1 mux with stimulus. **5M**
c). Explain gate delays with its representation. **5M**

or

2). a). Write gate level description for the circuit shown in figure 1. Also write the stimulus and simulation waveform for the same **8M**

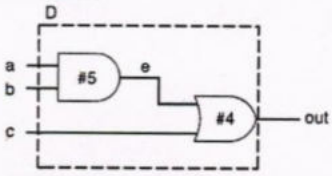


figure 1

b). Explain bitwise, arithmetic, logical, concatenation operator with examples. **7M**

Module 2

3).a). Implement 2:1 mux and 4:1 mux using conditional operator. **8M**
b). Explain structural procedures with example. **7M**

or

4). a). Explain blocking assignment and non blocking assignments with example. What is the advantage of non blocking assignment over blocking assignment **9M**
b). Explain multiway branching with examples **6M**

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An ISO 9001-2015 Certified Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19
II INTERNAL ASSESSMENT TEST
COURSE: VERILOG HDL

Time:75 minutes Max Marks:30M
Course Code:15EC53 Semester:V
Date:30/10/18

Answer any one question from each module

Module 1

1) a). Mention the gate instantiation of basic gates (and/or gate and not/buf gate). 5M
b). Write gate level description for 4:1 mux with stimulus. 5M
c). Explain gate delays with its representation. 5M

or

2). a). Write gate level description for the circuit shown in figure 1. Also write the stimulus and simulation waveform for the same 8M

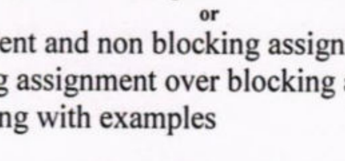


figure 1

b).Explain bitwise, arithmetic, logical, concatenation operator with examples. 7M

Module 2

3).a). Implement 2:1 mux and 4:1 mux using conditional operator. 8M
b). Explain structural procedures with example. 7M

or

4). a). Explain blocking assignment and non blocking assignments with example. What is the advantage of non blocking assignment over blocking assignment 9M
b). Explain multiway branching with examples 6M

PRINCIPAL
TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY, TUMKUR -06
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19

An ISO 9001:2015 Certified Institution

IINTERNAL ASSESSMENT TEST SCHEME & SOLUTIONS

NAME OF THE FACULTY:	[redacted]
DEPARTMENT:	ELECTRONICS AND COMMUNICATION
SUBJECT TITLE:	Verilog HDL
SUBJECT CODE:	15EC53
SIGNATURE:	[redacted]

Q.NO.	SOLUTION	MARKS
1) a)	Instantiation of and / or gate → (3M) — " —— not / buf gate → (2M)	(5M)
b)	~~#~~ verilog program for MUX 4:1 with gate level description → (3M) Stimulus → (2M)	(5M)
c)	gate delays → ~~turn on~~ rise delay; → (2M) ~~turn off~~ fall delay → (2M) turn off delay → (1M)	(5M)
2) a)	program for ckt → (4M) stimulus → (2M) waveform → (2M)	(8M)
b)	Explanation of each operator	(7M)

PRINCIPAL
SIET, TUMAKURU

Q.NO.	SOLUTION	MARKS
3) a) 2	program for 2:1 mux → (4m) program for 4:1 mux → (4m) } with explanation and truth table	(8m) 2
b) 2	Explanation on structural procedure	(7m) 2
4) a) 2	Explanation on blocking assignment ~~and~~ and non blocking assignment → (7m) advantage of non blocking over blocking (2m)	(9m) 2
b) 2	~~with~~ Explanation on case statement with example	(6m) 2

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An ISO 9001-2015 Certified Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19
III INTERNAL ASSESSMENT TEST
COURSE: VERILOG HDL

Time:75 minutes
Course Code:15EC53
Date:28/11/18

Max Marks:30M
Semester:V

Answer any one question from each module

Module 1

1) **a).** Explain the blocking assignment and non blocking assignment statements with relevant examples **8M**

b). Write a note on the following loop statements **7M**
i). while loop ii). Forever loop

or

2). **a).** Explain sequential and parallel blocks with examples **8M**

b). Write a verilog program for 8:1 mux using case statement. **7M**

Module 2

3).**a).** Explain the synthesis process with a block diagram. **8M**

b). Write a VHDL program for two 4 bit comparator using data flow description. **7M**

or

4). **a).** Explain the relationship between a design entity and its entity declaration and architecture body in VHDL **8M**

b). Explain the declaration of constant, variable and signal in VHDL with examples **7M**

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An ISO 9001-2015 Certified Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19
III INTERNAL ASSESSMENT TEST
COURSE: VERILOG HDL

Time:75 minutes
Course Code:15EC53
Date:28/11/18

Max Marks:30M
Semester:V

Answer any one question from each module

Module 1

1) **a).** Explain the blocking assignment and non blocking assignment statements with relevant examples **8M**

b). Write a note on the following loop statements **7M**
i). while loop ii). Forever loop

or

2). **a).** Explain sequential and parallel blocks with examples **8M**

b). Write a verilog program for 8:1 mux using case statement. **7M**

Module 2

3).**a).** Explain the synthesis process with a block diagram. **8M**

b). Write a VHDL program for two 4 bit comparator using data flow description. **7M**

or

4). **a).** Explain the relationship between a design entity and its entity declaration and architecture body in VHDL **8M**

b). Explain the declaration of constant, variable and signal in VHDL with examples **7M**

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY, TUMKUR -06
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19

An ISO 9001:2015 Certified Institution

III INTERNAL ASSESSMENT TEST SCHEME & SOLUTIONS

COURSE INSTRUCTOR:	
DEPARTMENT:	ECE
COURSE TITLE:	verilog HDL
COURSE CODE:	15EC53
SIGNATURE:	

Q.NO.	SOLUTION	MARKS
1) a)	Explanation on blocking and non blocking assignment statement	8m
b)	loop statement explanation 1) while loop 2) forever loop	7m
2) a)	Explanation on sequential and parallel blocks.	8m
b)	verilog code for 8:1 mux using case statement	7m
3) a)	Explanation of synthesis process with block diagram	8m

PRINCIPAL
SIET., TUMAKURU

Q.NO.	SOLUTION	MARKS
b) 2	VHDL program for a 4 bit comparator using data flow description	(2m)
4) a)	relationship b/w design entity & entity declaration and architecture body in VHDL.	(2m)
b)	Explanation on declaration of constant, variable & signal in VHDL	(3m)

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY
Department of Electronics and Communication
Academic Year-2018-2019
Internal Assessment 2

Subject: Information Theory and Coding (CBCS)

Max. Marks: 30 **Sub Code: 15EC54**
Time: 75 Minutes **Semester: V**

Answer any one full questions from each part:

1. a. Given the messages x1,x2,x3,x4,x5 and x6 with respective probabilities of 0.4,0.2,0.2, 0.1,0.07 and 0.03, construct a binary code by applying huffman procedure. Determine the efficiency and redundancy of the code so formed. 7M

b. Explain the block diagram of communication system 3M

c. Explain the properties of joint probability 5M

OR

2. a. In a communication system, a transmitter has 3 input symbols A={a1,a2,a3} and receiver has 3 output symbols B={b1,b2,b3}. The matrix given below shows JPM with some marginal probabilities. Find the missing Probabilities(*) in the table, Find P(b3/a1) and P(a1/b3), and Are the events a1 and b1 statistically independent? Why? 7M

	b_1	b_2	b_3
a_1	$\frac{1}{12}$	*	$\frac{5}{36}$
a_2	$\frac{5}{36}$	$\frac{1}{9}$	$\frac{5}{36}$
a_3	*	$1/6$	*
$P(b_j)$	$\frac{1}{3}$	$14/36$	*

b. Define the following 1) Priori entropy 2) Posteriori entropy 3) Equivocation 4) Mutual information 8M

3. a. For the JPM given below, compute individually H(X), H(Y), H(X,Y), H(X/Y), H(Y/X) and I(X,Y). Verify the relationship among these entropies. 8M

b. Derive the equation for channel capacity of Symmetric channel. 7M

OR

4.a.A binary symmetric channel has the noise matrix with probabilities of P(x1)=2/3 and P(x2)=1/3, Determine H(X),H(Y),H(X,Y),H(Y/X),H(X/Y) AND I(X,Y), Find the channel capacity, and find channel efficiency and redundancy 8M

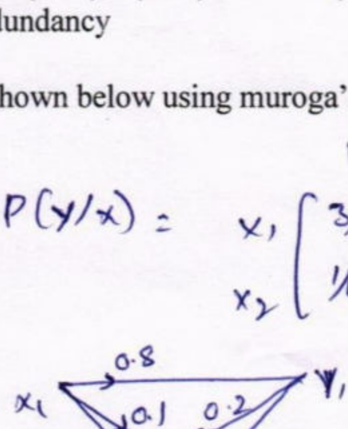
b. Find the capacity of the discrete channel shown below using muroga's method 7M

$$P(X,Y) = \begin{bmatrix} 0.05 & 0 & 0.20 & 0.05 \\ 0 & 0.10 & 0.10 & 0 \\ 0 & 0 & 0.20 & 0.10 \\ 0.05 & 0.05 & 0 & 0.10 \end{bmatrix}$$

(3·a)

$$P(y/x) = \begin{array}{c|cc} & y_1 & y_2 \\ \hline x_1 & 3/4 & 1/4 \\ x_2 & 1/4 & 3/4 \end{array}$$

(4·a)



(4.b)

PRINCIPAL
SIET., TUMAKURU.

⑪ 1.a – $L = 2.3$, $H(S) = 2.209$ $\eta_c = 96.04\%$ $R_{\eta c} = 3.96\%$

2.a – $P(b_3) = \frac{5}{18}$, $P(a_3, b_1) = \frac{1}{9}$, $P(a_1, b_2) = \frac{1}{9}$, $P(a_3, b_3) = 0$, $P(b_3/a_1) = \frac{5}{12}$

$P(a_1, b_3) = \frac{5}{36}$, $P(a_1, b_3) = \frac{1}{2}$

3.a – $P(y_1) = 0.10$ $P(y_2) = 0.15$ $P(y_3) = 0.50$ $P(y_4) = 0.25$

$P(x_1) = 0.30$ $P(x_2) = 0.20$ $P(x_3) = 0.30$ $P(x_4) = 0.20$

$H(x) = 1.971$ $H(y) = 1.743$ $H(x, y) = 3.122$ $H(x/y) = 1.379$

$H(y/x) = 1.151$

3.b – $C = \log s - h$

4a – $H(x) = 0.9183$ $H(y) = 0.9799$ $H(y/x) = 0.8113$ $H(x, y) = 1.7296$

$H(x/y) = 0.7497$ $I(x, y) = 0.1686$ $C = 0.1887$ $\eta_c = 89.35$

4.b – $Q_1 = -0.6553$ $Q_2 = -0.9887$ $Q_3 = -0.6553$

$C = 0.8269$ $C = 8269$ bits/sec.

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY

SIRA ROAD, TUMKUR – 06

(An ISO 9001-2015 Certified Institution)

Department of Electronics and Communication Engineering

2nd Internal Scheme of Evaluation

FS 543667

An ISO 9001:2015 Certified Institution

NAME OF THE FACULTY:	Haripriya. R
DEPARTMENT:	ECE
SUBJECT TITLE:	ITC
SUBJECT CODE:	15EC54
SIGNATURE:	H-f

Q.NO	SOLUTION	MARKS
1. a.	$L = 2.3$ — 1 $H(S) = 2.209$ — 2 $\eta_c = 96.04\%$ — 2 $R\eta_c = 3.96\%$ — 2	7M
b.	Block diagram — 2M Explanation — 1M	3M
c.	Joint probability properties — 5M	
2.a	$P(b_3) = \frac{5}{18}$, $P(a_3, b_1) = \frac{1}{9}$, $P(a_1, b_2) = \frac{1}{9}$, $P(a_3, b_3) = 0$, $P(b_3 \mid a_1) = \frac{5}{12}$, $P(a_1, b_3) = \frac{5}{36}$ $P(a_1, b_3) = 1/2$	7M

PRINCIPAL

b.	Definition 1) priori Entropy — 2 2) posteriori Entropy — 2 3) Equivocation — 2 4) Mutual Information — 2	8
3. a	$P(y_1) = 0.10$ $P(y_2) = 0.15$ $P(y_3) = 0.50$ $P(y_4) = 0.25$ $P(x_1) = 0.30$ $P(x_2) = 0.20$ $P(x_3) = 0.30$ $P(x_4) = 0.20$ $H(x) = 1.971$ $H(y) = 1.743$ $H(x,y) = 3.122$ $H(x/y) = 1.379$ $H(y/x) = 1.151$	8M

Q.NO	SOLUTION	MARKS
3. b	Derivation Carries 7M	7M
4. a	$H(x) = .9183$ $H(y) = 0.9799$ $H(y/x) = 0.8113$ $H(x,y) = 1.7296$ $H(x/y) = 0.7497$ $I(x,y) = 0.1686$ $C = 0.1887$ $\eta_c = 89.35$	8M
b.	$Q_1 = -0.6553$ $C = 0.829$ $Q_2 = -0.9887$ $C = 8269$ $Q_3 = -0.6553$	7M

PRINCIPAL
SIET., TUMAKUR

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY
Department of Electronics and Communication
Academic Year-2018-2019
Internal Assessment 3
Subject: Information Theory and Coding (CBCS)

FS 543667
An ISO 9001:2015 Certified Institution

Max. Marks: 30
Time: 75 Minutes

Sub Code: 15EC54
Semester: V

Answer any one full questions from each part:

1. a. List and Explain i) Methods of controlling errors ii)Types of errors iii)Types of codes 15M

OR

2.a. Explain the matrix description of linear block codes. 7M

b. If C is a valid code vector namely C=DG then Prove that $CH^T=0$ where H^T is the transpose of parity check matrix H. 8M

3 a. For the (3,2,1) given encoder find code word C using Time Domain approach and transform domain approach given g(1)=(110) g(2)=(101) and g(3)=(111) 15M

[111, 010, 001, 110, 100, 101, 011]

OR

4.a. For a (2,1,3) convolutional encoder with g(1)=(1101) g(2)= (1011). Draw the encoder diagram and find the output sequence using both time domain and transform domain 15M

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY
Department of Electronics and Communication
Academic Year-2018-2019
Internal Assessment 3
Subject: Information Theory and Coding (CBCS)

FS 543667
An ISO 9001:2015 Certified Institution

Max. Marks: 30
Time: 75 Minutes

Sub Code: 15EC54
Semester: V

Answer any one full questions from each part:

1. a. List and Explain i) Methods of controlling errors ii)Types of errors iii)Types of codes 15M

OR

2.a. Explain the matrix description of linear block codes. 7M

b. If C is a valid code vector namely C=DG then Prove that $CH^T=0$ where H^T is the transpose of parity check matrix H. 8M

3. a. For the (3,2,1) given encoder find code word C using Time Domain approach and transform domain approach given g(1)=(110) g(2)=(101) and g(3)=(111) 15M

OR

4.a. For a (2,1,3) convolutional encoder with g(1)=(1101) g(2)= (1011). Draw the encoder diagram and find the output sequence using both time domain and transform domain 15M

PRINCIPAL

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY, TUMKUR -06
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19(odd semester)
3rd ~~SECOND~~ INTERNAL ASSESSMENT
SCHEME & SOLUTION

An ISO 9001:2015 Certified Institution
FS 543667

NAME OF COURSE INSTRUCTOR:	Haripriya. R
PROGRAMME:	BE
COURSE TITLE:	ITC
COURSE CODE:	15EC54
SIGNATURE:	

Q.NO	SOLUTION	MARKS
1.a.	i) Methods of Controlling Errors 5 ii) Types of errors – 5 iii) Types of Codes – 5	15M
2.a.	Matrix description Derivation – 7M	7M
b.	$C = DG$. Proof of $CH^T = 0$ – 8M	8M
3.a.	Time domain Approach – 7½ Transform Domain Approach – 7½	15
4.a	$g(1) = (1101)$ $g(2) = (1011)$	

PRINCIPAL

Q.NO	SOLUTION	MARKS
	Encoder diagram – 5 Output Sequence – Time domain – 5 Output Sequence – Transform Domain – 5	15M

PRINCIPAL
SIET., TUMAKURU

Sri Shridevi Charitable Trust [R]

Shridevi Institute of Engineering and Technology

DEPARTMENT OF ELECTRONICS & COMMUNICATION

Academic Year -2018-19

FS 543667

An ISO 9001:2015 Certified Institution

1st INTERNAL ASSESMENT

Sub: Digital Communication **Sub code:15EC61**

Marks: 30 **Time Duration:75Min**

Answer any two full questions from each module

1.a.	State and prove the properties of Hilbert Transform	7M
b.	Explain the pre-envolope and Canonical Representation of band pass signals	8M
	OR	
2.a.	What is Line coding. For the binary code 011010 skecth the following line codes i) Unipolar NRZ ii) Polar NRZ, iii)Biploar RZ iv) Manchester	8M
b.	Derive the Power Spectral Density Equation for NRZ, Unipolar Format	7M
3.a.	Write an overview of HDB3,B3ZS and B6ZS	7M
b.	Derive the Power Spectral Density Equation for Manchester Coding	8M
	OR	
4.a.	Explain the ASK modulation and Derive the Equation for Probability of Error	10M
b.	Derive the Equation for Probability of Error of BPSK.	5M

Sri Shridevi Charitable Trust [R]

Shridevi Institute of Engineering and Technology

DEPARTMENT OF ELECTRONICS & COMMUNICATION

Academic Year -2018-19

FS 543667

An ISO 9001:2015 Certified Institution

1st INTERNAL ASSESMENT

Sub: Digital Communication Sub code:15EC61

Marks: 30 Time Duration:75Min

Answer any two full questions from each module

1.a. State and prove the properties of Hilbert Transform 7M

b. Explain the pre-envolope and Canonical Representation of band pass signals 8M

OR

2.a. What is Line coding. For the binary code 011010 skecth the following line codes i) Unipolar NRZ ii) Polar NRZ, iii)Biploar RZ iv) Manchester 8M

b. Derive the Power Spectral Density Equation for NRZ, Unipolar Format 7M

3.a. Write an overview of HDB3,B3ZS and B6ZS 7M

b. Derive the Power Spectral Density Equation for Manchester Coding 8M

OR

4.a. Explain the ASK modulation and Derive the Equation for Probability of Error 10M

b. Derive the Equation for Probability of Error of BPSK. 5M

PRINCIPAL
SIET., TUMAKURU.

Scheme of Evaluation

NAME OF THE FACULTY:	Haripriya R
DEPARTMENT:	ECE
SUBJECT TITLE:	Digital Communication (I)
SUBJECT CODE:	15EC61
SIGNATURE:	

Q.NO	**SOLUTION**	**MARKS**
1. a.	Hilbert transform - Statement - 1M 3 properties each carry - 2M	7M
b.	Pre-Envolope — 4 M Canonical Representation of Band pass Signals — 4M.	8M
2. a.	Definition of Line Coding - 2M 1) Unipolar NRZ - 1½ 2) Polar NRZ - 1½ 3) Bipolar RZ - 1½ 4) Manchester - 1½	8M
b	Derivation of power Spectral density Equation for NRZ Unipolar format — 7M	7M
3a		

PRINCIPAL
SIET., TUMAKURU

Q.NO	SOLUTION	MARKS
3.a.	HDB3 – 2½M B3ZS – 2½M B6ZS – 2M	7M
b.	Derivation of power Spectral Density Equation for Manchester Coding – 8M	8M
4.a	Modulation Block diagram – 3M Demodulation Block diagram – 3M Derivation of probability of Error – 4M	10M
b.	Derivation of Equation of probability of Error of BPSK – 5M	5M

PRINCIPAL
SIET., TUMAKURU.

Sri Shridevi Charitable Trust [R]

Shridevi Institute of Engineering and Technology

DEPARTMENT OF ELECTRONICS & COMMUNICATION

Academic Year -2018-19

FS 543667

An ISO 9001:2015 Certified Institution

2nd INTERNAL ASSESMENT

Sub: Digital Communication **Sub code:15EC61**

Marks: 30 **Time Duration:75Min**

Answer any two full questions from each module

1.a With a neat block diagram explain the generation and detection of QPSK signals 8M

b Define M-ary PAM and obtain the constellation of PSK for m-ary 7M

OR

2.a. For the binary sequence given bye buy 100 100 1 1 illustrate the operation of dpsk 7M

b. with neat block diagram explain the non-coherent detection of binary frequency shift keying technique 8M

3.a. with a neat block diagram of digital p a m system 7M

b. obtain the expression for ~~or~~ inter symbol interference along with eye pattern and state and prove nyquist condition for zero ISI 8M

OR

4.a. Explain the design of Band Limited signals with controlled ISI 8M

b. Describe the time domain and frequency domain characteristics of a duobinary signals 7M

Sri Shridevi Charitable Trust [R]

Shridevi Institute of Engineering and Technology

DEPARTMENT OF ELECTRONICS & COMMUNICATION

Academic Year -2018-19

FS 543667

An ISO 9001:2015 Certified Institution

2nd INTERNAL ASSESMENT

Sub: Digital Communication **Sub code:15EC61**

Marks: 30 **Time Duration:75Min**

Answer any two full questions from each module

1.a With a neat block diagram explain the generation and detection of QPSK signals 8M

b Define M-ary PAM and obtain the constellation of PSK for m-ary 7M

OR

2.a. For the binary sequence given bye buy 100 100 1 1 illustrate the operation of dpsk 7M

b. with neat block diagram explain the non-coherent detection of binary frequency shift keying technique 8M

3.a. with a neat block diagram of digital p a m system 7M

c. obtain the expression for or inter symbol interference along with eye pattern and state and prove nyquist condition for zero ISI 8M

OR

4.a. Explain the design of Band Limited signals with controlled ISI 8M

c. Describe the time domain and frequency domain characteristics of a duobinary signals 7M

PRINCIPAL
SIET., TUMAKURU

Scheme of Evaluation

NAME OF THE FACULTY:	Haripriya.R
DEPARTMENT:	ECE
SUBJECT TITLE:	Digital Communication (II)
SUBJECT CODE:	15EC61
SIGNATURE:	

Q.NO	SOLUTION	MARKS
1.a.	Block diagram Transimitter/Modulator – 2M Receiver/Demodulator – 2M Explanation of Modulator and Demodulator – 4M	8M
b.	Definition of M-ary PAM – 3M Constellation of PSK for m-ary – 4M	7M
2.a.	Operation of DPSK with all steps – 7M	7M
b	Block diagram of BFSK – 4M Explanation of Coherent detection – 4M	8M
3.a.	Block diagram of PAM System – 3M Explanation – 4M	7M
b.	Intersymbol Interference – 2M Eye pattern – 2M	8M

PRINCIPAL
SIET. TUMAKURU

Q.NO	SOLUTION	MARKS
	Statement & proof - 4M	
4.a.	Explanation of Band limited Signals with Controlled ISI – 4M Design – 4M	8M
b-	Time domain characteristics – 4M Frequency domain characteristics 3M	7M

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An ISO 9001-2015 Certified Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19
I INTERNAL ASSESSMENT TEST
COURSE: REAL TIME SYSTEMS

Time:75 minutes **Max Marks:30M**
Course Code:15EC743 **Semester:V**
Date:24/09/18

Answer any one question from each module

Module 1

1) **a).** Define real time systems. Explain different classification of real time system. **8M**
b). What is DDC? What are the advantages of DDC over analog control? Discuss PID control algorithm **7M**

or

2). **a).** Define the term "time constraints". How are RTS classified based on time constraints? Explain them with appropriate equations. **8M**
b). Explain briefly i).pre programmed adaptive control; ii). Self tuning adaptive control; iii). Model reference adaptive control. **7M**

Module 2

3).**a).** Mention the features of specialized processor & explain MIMD, with a neat diagram **8M**
b). Briefly explain the following i).Parallel computers ii). Polling iii). DMA. **7M**

or

4). **a).** With neat flow diagram explain interrupt masking **4M**
b). Explain analog interface for input output operation. **8M**
c). Define in brief about synchronous and asynchronous transmission technique. **5M**

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An ISO 9001-2015 Certified Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19
I INTERNAL ASSESSMENT TEST
COURSE: REAL TIME SYSTEMS

Time:75 minutes **Max Marks:30M**
Course Code:15EC743 **Semester:V**
Date:24/09/18

Answer any one question from each module

Module 1

1) **a).** Define real time systems. Explain different classification of real time system. **8M**
b). What is DDC? What are the advantages of DDC over analog control? Discuss PID control algorithm **7M**

or

2). **a).** Define the term "time constraints". How are RTS classified based on time constraints? Explain them with appropriate equations. **8M**
b). Explain briefly i).pre programmed adaptive control; ii). Self tuning adaptive control; iii). Model reference adaptive control. **7M**

Module 2

3).**a).** Mention the features of specialized processor & explain MIMD, with a neat diagram **8M**
b). Briefly explain the following i).Parallel computers ii). Polling iii). DMA. **7M**

or

4). **a).** With neat flow diagram explain interrupt masking **4M**
b). Explain analog interface for input output operation. **8M**
c). Define in brief about synchronous and asynchronous transmission technique. **4M**

PRINCIPAL
SIET, TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY, TUMKUR -06
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19

FS 543667
An ISO 9001:2015 Certified Instit

I INTERNAL ASSESSMENT TEST SCHEME & SOLUTIONS

NAME OF THE FACULTY:	HARISH B
DEPARTMENT:	ELECTRONICS AND COMMUNICATION
SUBJECT TITLE:	Real time systems
SUBJECT CODE:	15EC743
SIGNATURE:	

Q.NO.	SOLUTION	MARKS
1)a) 2	definition on real time system (2m) 2 classification of RTS with example + (6m)	(8m) 2
b)	DDC algorithm- with diagram + (3m) 2 advantages of DDC over analog control + (2m) 2 PID control algorithm —/ (2m)	(7m) 2
2) a) 2	definition of time constraint ..→ (2m) 2 classification of RTS based on time constraints (4m) equation (appropriate) → (2m) 2	(8m) 2

PRINCIPAL
SIET., TUMAKURU

Q.NO.	SOLUTION	MARKS
5)	Explanation on i) pre programmed adaptive control → (3m) ii) Selftuning adaptive control (2m) iii) model reference adaptive control (2m)	(7m)
3) a)	features of specialized processor. → (4m) MIMD → (4m)	(8m)
b)	Explanation on i) parallel computer → (3m) ii) polling → (2m) iii) DMA → (2m)	(7m)
4) a)	Interrupt masking flow diagram → (4m)	
b)	analog interface & I/p & O/p operation with diagram → (8m)	
c)	asynchronous and synchronous transmission technique	(5m)

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An ISO 9001-2015 Certified Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19
II INTERNAL ASSESSMENT TEST
COURSE: REAL TIME SYSTEMS

Time:75 minutes **Max Marks:30M**
Course Code:15EC743 **Semester:VII**
Date: 30/10/18

Answer any one question from each module

Module 1

1) . a). Explain the ISO seven layer model for data communication 7M
b). How do strong data typing contribute to the security of programming language 8M

or

2). a). Explain the following requirement of real time systems in detail
i). security ii). Readability iii). Flexibility iv). Simplicity v). portability 10M
b). Write a note on control structures used in programming languages. 5M

Module 2

3). a). In brief explain the overview of RT-languages 8M
b). In detail explain about exception handling with few examples. 7M

or

4). a). With neat diagram explain the typical structure of a RTOS 6M
b). Explain in brief about cyclic and preemptive scheduling. 4M
c). With neat diagram explain general structure of a simple operating system. 5M

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An ISO 9001-2015 Certified Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19
II INTERNAL ASSESSMENT TEST
COURSE: REAL TIME SYSTEMS

Time:75 minutes **Max Marks:30M**
Course Code:15EC743 **Semester:VII**
Date: 30/10/18

Answer any one question from each module

Module 1

1) . a). Explain the ISO seven layer model for data communication 7M
b). How do strong data typing contribute to the security of programming language 8M

or

2). a). Explain the following requirement of real time systems in detail
i). security ii). Readability iii). Flexibility iv). Simplicity v). portability 10M
b). Write a note on control structures used in programming languages. 5M

Module 2

3). a). In brief explain the overview of RT-languages 8M
b). In detail explain about exception handling with few examples. 7M

or

4). a). With neat diagram explain the typical structure of a RTOS 6M
b). Explain in brief about cyclic and preemptive scheduling. 4M
c). With neat diagram explain general structure of a simple operating system. 5M

SHRIDEVI
EDUCATION

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY, TUMKUR -06
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
ACADEMIC YEAR 2018-19

FS 543667
An ISO 9001:2015 Certified Insti

II INTERNAL ASSESSMENT TEST SCHEME & SOLUTIONS

NAME OF THE FACULTY:	HARISH B
DEPARTMENT:	ELECTRONICS AND COMMUNICATION
SUBJECT TITLE:	Real time systems
SUBJECT CODE:	15EC743
SIGNATURE:	

Q.NO.	SOLUTION	MARKS
1) a)	diagram → (3m) Explanation of each layer → (4m)	(7m)
b)	Explanation on security of programming language	(8m)
2) a)	Explanation of security (2m), Readability (2m), flexibility (2m), simplicity (2m), portability (2m)	(10m)
b)	Explanation on control structure in programming language.	(5m)

PRINCIPAL
SIET., TUMAKURU.

Q.NO.	SOLUTION	MARKS
3)a)	overview of Real time language	8M
b)	Explanation on exception handling —)	2M
4)a)	diagram (3M) Explanation → (3M)	6M
b)	cyclic scheduling explanation (1½M) preemptive scheduling with round robin, static priority, dynamic priority (2½M)	4M
c)	diagram → (2M) Explanation → (3M)	5M

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI EDUCATION

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY

(Recognised by Govt. of Karnataka, Affiliated to VTU, Belagavi and Approved by AICTE, New Delhi)
Sira Road, Tumakuru - 572 106. Karnataka.

FS 543667
An ISO 9001:2015 Certified Institution

Department of MBA

II Semester: I Internal Assessment Test, March 2018

Subject: Research Methods (18MBA23)

Time: 90 Minutes **Max. Marks: 40**

Answer the following questions:

1. a. What is Research?	02 Marks
b. Explain the types of Research?	06 Marks
c. Explain the process of Research?	08 Marks
2. a. What is Hypothesis?	02 Marks
b. What are the features of good research study?	06 Marks
c. Explain the meaning and classification of Experimental designs?	08 Marks
3. a. Compare and Contrast Exploratory and Descriptive research:-	08 Marks

SHRIDEVI EDUCATION

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY

(Recognised by Govt. of Karnataka, Affiliated to VTU, Belagavi and Approved by AICTE, New Delhi)
Sira Road, Tumakuru - 572 106. Karnataka.

FS 543667
An ISO 9001:2015 Certified Institution

Department of MBA

II Semester: I Internal Assessment Test, March 2018

Subject: Research Methods (18MBA23)

Time: 90 Minutes Max. Marks: 40

Answer the following questions:

1. a. What is Research? 02 Marks
b. Explain the types of Research? 06 Marks
c. Explain the process of Research? 08 Marks

2. a. What is Hypothesis? 02 Marks
b. What are the features of good research study? 06 Marks
c. Explain the meaning and classification of Experimental designs? 08 Marks

3. a. Compare and Contrast Exploratory and Descriptive research:- 08 Marks

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
(Recognised by Govt. of Karnataka, Affiliated to VTU, Belagavi and Approved by AICTE, New Delhi)
Sira Road, Tumakuru - 572 106. Karnataka.
An ISO 9001:2015 Certified Institution

Department of MBA
Scheme of Evaluation – II Internals
II Sem **17MBA22: Research Methods** **Max.Marks:40**

1 A .What is research.?

- . Research is the careful consideration of study regarding a particular concern or research problem using scientific methods. According to the American sociologist Earl Robert Babbie, "research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods.

1.B Explain the types of research.?

Fundamental research
Fundamental, also known as basic or theoretical, research is designed to help researchers better understand certain phenomena in the world. It looks at how things work but does not seek to find how to make them work better. This research attempts to broaden your understanding and expand scientific theories and explanations.

Applied research
Applied research is designed to identify solutions to specific problems or find answers to particular questions. It offers knowledge that is applicable and implementable.

Action research
Action research refers to examining actions, assessing their effectiveness in bringing about the desired outcome and choosing a course of action based on those results. It is typically used in educational settings for teachers and principals to perform a type of self-assessment and course correction

Causal research
Causal research, also called explanatory research, seeks to determine cause-and-effect relationships between variables. It identifies how much one variable may cause a change in the other. Causal research is important for evaluating current processes and procedures and determining if and how changes should take place.

Classification research
Classification research seeks to identify and classify individual elements of a group into larger groups or subgroups.

Comparative research
Comparative research identifies similarities and differences between two individuals, subjects or groups

Cross-sectional research
Cross-sectional, or synchronous, research studies a group or subgroup at one point in time. Participants are generally chosen based on specific shared characteristics, such as age, gender or income, and researchers examine the similarities and differences within and between groups. The group is often used as a representation of a larger population.

Deductive research
Deductive, or theory-testing, research is the opposite of inductive research and moves from the broad to the specific. Researchers choose a hypothesis and test its accuracy through experimentation or observation.

1.c.Explain the process of research.?

PRINCIPAL
SIET., TUMAKURU

Identify the project topic A successful research process often begins with a clearly defined intent for the research project. You can focus on a topic in nearly any field of study, as the research process broadly applies across all academic and professional fields. The more precisely you identify the topic for your research, the more effectively you can design a process in order to conduct your research.

Review any When working on a research project, understanding existing information related to your topic can be a foundational element of the process. Researching existing data and writing regarding the topic allows you to identify the need for your intended research, and it can help provide the information you need in order to design your research approach effectively in later steps

Submit process for review available literature

When you plan to submit the results of your research process for formal assessment, such as for a higher education degree project or in professional work, you may need to submit your process for approval before beginning your research project. This allows the individuals you will report to the opportunity to examine your intent and ensure that it meets their standards and specifications. Receiving approval before continuing with the research process can help you ensure you spend your time wisely and your project is acceptable.

Create an initial hypothesis

Using the information you have gathered, you can form your initial hypothesis for your research. Your hypothesis represents what you expect to discover through your research process, based on your previous knowledge and any information you gathered from your preliminary reading. The research you perform in later steps tests this hypothesis, in order to confirm or invalidate it based on new information

Design the research approach

Working on a large research project can require careful planning. Designing your overall research structure is an important step in the process in order to ensure that you spend your time well. During this phase, you can determine what resources you will use to further enhance your understanding, as well as any sources of data or experiments required to further inform you and help you reach an accurate conclusion

Begin gathering data After creating your designs and any experiments required. You can organize your data into structures that make it easy to execute it. You can gather new data and information from your research sources for you to work with it and identify key pieces for your research process

Analyze the results

After sorting all of your information into organized sets, you can begin performing analysis on it. Through this phase, you examine the data or research in order to identify new relevant information and how it relates to your original hypothesis and chosen topic. The goal of analysis is not to find information that supports your original hypothesis specifically, but to assess all information and come to the most accurate conclusion about what the information shows.

Create your report

Compiling a report once you've reached your conclusions allows you to sort that information into a format you can share with others. For extensive research projects, it is common to include an executive summary at the start of a report, which provides a brief look at the key points for your audience. It's important to check any rules and guidelines provided to ensure your report complies. This can improve your chances of having the report accepted and makes it more effective for those reading it by ensuring it covers the desired points your audience is interested in.

Proofread and submit

After completing your report, it is important to take time to proofread the entire document before formal submission. This allows you to identify any typos or mistakes that can affect the document's accuracy and provides the last opportunity to check any logic you used in the development of your report. Doing so may also raise the overall quality of your report and make it a more effective process.

2.A . What is Hypothesis?

A hypothesis is an assumption that is made based on some evidence. This is the initial point of any investigation that translates the research questions into predictions. It includes components like variables, population and the relation between the variables. A research hypothesis is a hypothesis that is used to test the relationship between two or more variables.

2.B. What are the Features of a Good Research

There are several characteristics of good research:

1. **Originality:** Good research should be original and contribute new knowledge to a field of study.
2. **Replicability:** Other researchers should be able to replicate the study and obtain similar results.
3. **Reliability:** The results of the research should be consistent and reliable.
4. **Valid:** The research should be designed and conducted in a way that ensures the results are accurate and reliable.
5. **Ethical:** The research should be conducted ethically, with the well-being and rights of any participants being a top priority.
6. **Rigorous:** The research should be conducted in a thorough and meticulous manner, with a high level of attention to detail.
7. **Systematic:** The research should be well-organized and follow a logical, systematic process.

2.c. Explain the meaning and classification of experimental designs

Experimental Research Design is a framework of protocols and procedures created to conduct experimental research with a scientific approach using two sets of variables. Herein, the first set of variables acts as a constant, used to measure the differences of the second set. The best example of experimental research methods is quantitative research.

Pre-experimental Research Design

A research study could conduct pre-experimental research design when a group or many groups are under observation after implementing factors of cause and effect of the research. The pre-experimental design will help researchers understand whether further investigation is necessary for the groups under observation.

True Experimental Research Design

A true experimental research design relies on statistical analysis to prove or disprove a researcher's hypothesis. It is one of the most accurate forms of research because it provides specific scientific evidence. Furthermore, out of all the types of experimental designs, only a true experimental design can establish a cause-effect relationship within a group. However, in a true experiment, a researcher must satisfy these three factors

Quasi-experimental Research Design

The word "Quasi" means similarity. A quasi-experimental design is similar to a true experimental design. However, the difference between the two is the assignment of the control group. In this research design, an independent variable is manipulated, but the participants of a group are not randomly assigned. This type of research design is used in field settings where random assignment is either irrelevant or not required.

3. A. Compare and contrast exploratory and descriptive research

PRINCIPAL
SIET., TUMAKURU

What is Descriptive Research?

As the name implies, a descriptive research is descriptive in nature and gathers statistics, which is later carefully studied to arrive at conclusions. In fact, descriptive research often leads to formulation of hypothesis as collation and analysis of data produces conclusions that form the basis of another research. So, if there is a research about the use of alcohol among teenagers, it typically begins with collection of data that is descriptive in nature and lets people know the age and drinking habits of students. Descriptive research is helpful for calculations and to arrive at statistical tools such as median, averages, and frequencies.

What is Exploratory Research?

Exploratory research is challenging in the sense that it tackles vaguely defined hypothesis and tries to find answers to questions. This kind of research is social in nature and requires some preliminary work in the direction of the research. In fact, sociologist Earl Babbie treats exploratory as the purpose of the research saying this kind of research proves to be useful when the hypothesis has yet not been formed or developed. There are certain basic premises that need to be tested at the start of an exploratory research. With the help of these hypotheses, the researcher hopes to arrive at more generalizations.

BASIS FOR COMPARISON	**EXPLORATORY RESEARCH**	**DESCRIPTIVE RESEARCH**
Meaning	Explorartory research means a research conducted for formulating a problem for more clear investigation.	Descriptive research is a research that explore and explain an individual, group or a situation.
Objective	Discovery of ideas and thoughts.	Describe characteristics and functions.
Overall Design	Flexible	Rigid
Research process	Unstructured	Structured
Sampling	Non-probability sampling	Probability sampling
Statistical Design	No pre-planned design for analysis.	Pre-planned design for analysis.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
(Recognised by Govt. of Karnataka, Affiliated to VTU, Belagavi and Approved by AICTE, New Delhi)
Sira Road, Tumakuru - 572 106. Karnataka.
An ISO 9001:2015 Certified Institution

Department of MBA
I Semester: I Internal Assessment Test, November 2018
18MBA11: Management & Organizational Behaviour

Time: 90 Minutes **Max. Marks: 50**

Answer the following questions

1. a. What do you mean by Management?	**03 Marks**
b. Explain the Functions of Management.	**07 Marks**
c. Discuss the various Managerial Roles.	**10 Marks**
2. a. Define Planning?	**03 Marks**
b. Elucidate the Contributions & Limitations of Scientific Management.	**07 Marks**
c. Explain the Fayol's 14 principles of Management.	**10 Marks**
3. a. Explain the Planning Process.	**10 Marks**

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
(Recognised by Govt. of Karnataka, Affiliated to VTU, Belagavi and Approved by AICTE, New Delhi)
Sira Road, Tumakuru - 572 106. Karnataka.
An ISO 9001:2015 Certified Institution

Department of MBA
I Semester: I Internal Assessment Test, November 2018
18MBA11: Management & Organizational Behaviour

Time: 90 Minutes Max. Marks: 50

Answer the following questions

1. a. What do you mean by Management? 03 Marks
b. Explain the Functions of Management. 07 Marks
c. Discuss the various Managerial Roles. 10 Marks

2. a. Define Planning? 03 Marks
b. Elucidate the Contributions and limitations of Scientific Management. 07 Marks
c. Explain the Fayol's 14 principles of Management. 10 Marks

3. a. Explain the Planning Process. 10 Marks

PRINCIPAL
SIET., TUMAKURU.

1-a) Management is a process of designing
& Maintaining an environment in which
Individuals working together in groups
Accomplish their aims effectively &
Efficiency.

1-b) functions of Mgt

*) planning
*) organising
*) staffing
*) Directing
*) communication
*) Co-ordinating
*) Motivating
*) Reporting
*) Budgetting
*) Controlling.

PRINCIPAL
SIET., TUMAKURU

roles	roles	
Figurehead	Monitor	Enterpreneur
Leader	Disseminator	Disturbance handler
Liaison	Spokesperson	Resource allocator
		Negotiator.

2-a) According to Koontz & O'Donnell, planning is "an intellectual process, the conscious determination of course of action, the basing of decisions on purpose facts & considered estimates.

2-b) Limitations of scientific Mgt.

- *) Exploitative device
- *) Depersonalised work
- *) Undemocratic
- *) Unrealistic
- *) Requires huge Capital.

2-c) 14 p

*) Division of work.

*) Authority

*) Discipline

*) unity of command

*) unity of direction

*) Subordination of Individual Interest

*) Remuneration

*) Centralization

*) Scalar chain

*) Order

*) Equity

*) Stability of personnel

*) Initiative

*) E-spirit de crops.

3-a)

PRINCIPAL
SIET., TUMAKURU.

3a) Planning process

Perception of oppounities
↓
Establishment of objectives
↓
Planning premises
↓
Identification of alternatives
↓
Evaluation of Alternatives
↓
Choice of alternatives.

2018-19

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

INTERNAL ASSESMENT TEST: I
SUB : **Advanced computer Architecture (15CS72)**
SEM : VII

DATE:20/09/2018
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1 **a**. With a neat diagram explain evolution of computer architecture along with flynn'sClassification? **7M[CO1]**

b. Explain the system attributes which helps to determine performance? **8M [CO1]**

OR

2. a. Write a note on generations of computers? **7M [CO1]**

b. Explain Shared memory Multiprocessors. **8M [CO1]**

3. **a.** What is Bernstein conditions? How it helps to achieve parallelism? **7M [CO1]**

b. With a neat diagram Explain Static connection networks. **8M [CO1]**

OR

4. a. Write the difference between control flow, data flow and reduction flow mechanism? **8M [CO1]**

b Explain multivector and SIMD computers? **7M [CO1]**

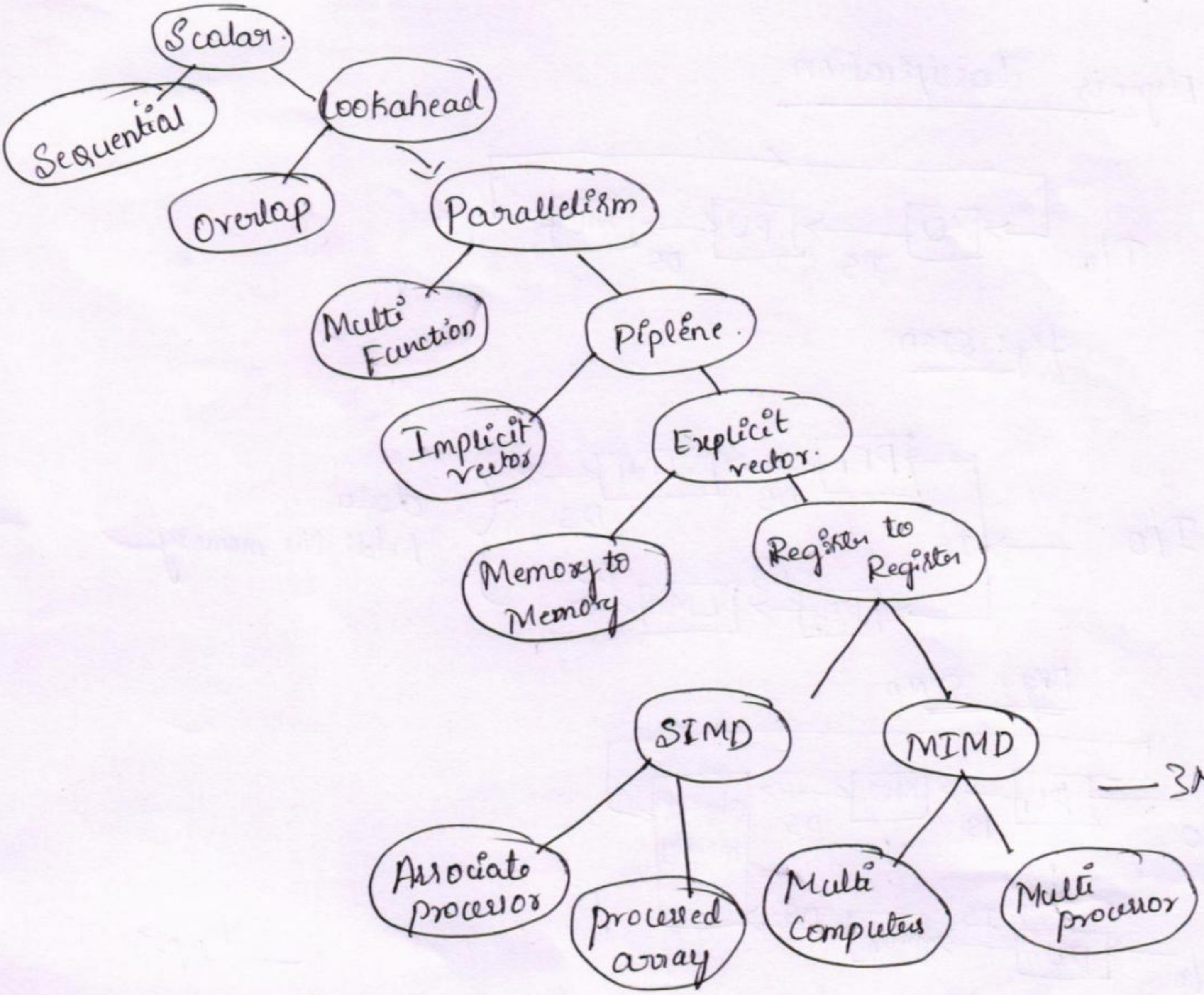
PRINCIPAL
SIET., TUMAKURU.

Shridevi Institute of Engineering & Technology

Department of Computer Science & Engineering.

I Internal - Scheme & Solutions.

1.a. Evolution of computer Architecture.



— 3M

Fig: Hierarical Model of Evolution of computer Architecture

- The fig describes the evolution of computer architecture it defines the tree structure with branches and leafs.
- Starting from Scalar it has been carried out till the final having the processor array associate processor.

* Final be the multiprocessor and Multicomputers however this architecture is level high and can be initialized oftenly by same branches.
* Each module have its own significance carrying out of the Register to register and memory to memory.
* Similarly from pipeline and this ancestors will be the parallelism and lookahead from the Scalar which is considered as the root.

Flynnis classification

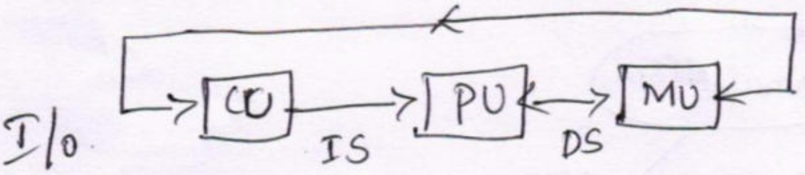


fig: SISD

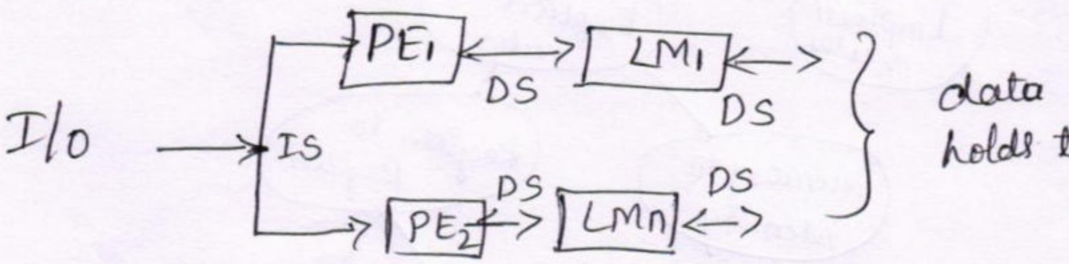
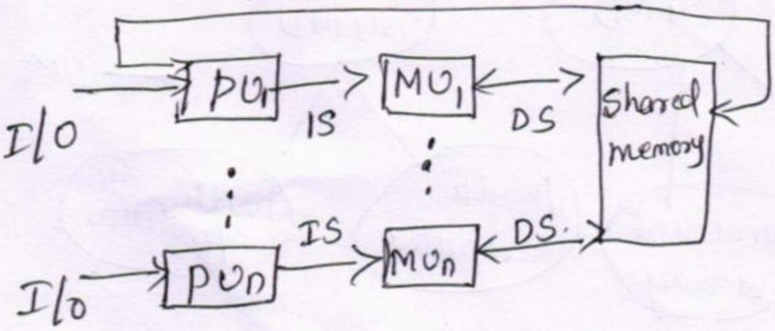


Fig: SIMD



—4M

Fig: MIMD

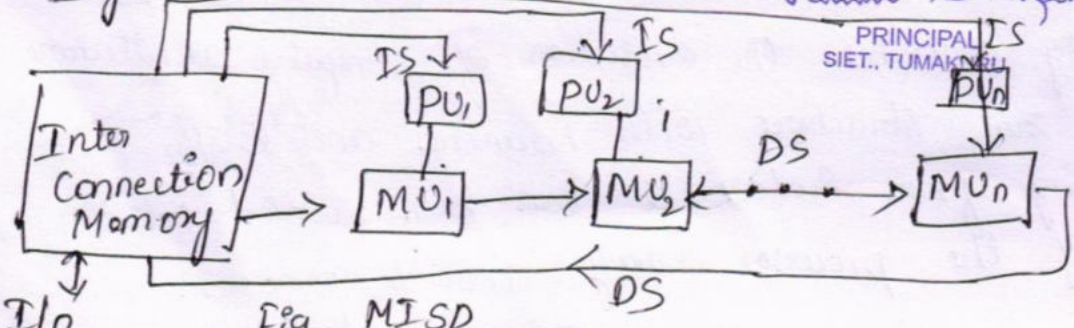


Fig MISD

* flyn's classification can be observed in the following figures of SIMD & MIMD
* Along with the SIMD & MIMD we have SSID & MISD
* Here CU stands for control unit, P stands from processor. MU stands for memory unit PU stands for processor. Unit and LM stands for local memory
* here classification differs from one to another and its more complex when composed to other.
* Memory and I/o plays a very important role and are used oftenly as and when required by the System

1.b) System attributes which helps to determine. performance are;

1) clock Rate and API
2) performance factor
3) System attributes
4) MIPS rate
5) Floating point operations per Second
6) Through put rate.

— 2M

Clock rate and API :

* clock rate differes from the processors time clock. $\boxed{f = \frac{1}{\tau}}$ where the Symbol 'τ' stands for the processor. time and here the application programming interface is also used
* However clock rate differs from one System to another and hence the functions are carried out efficiently

2> performance factors:-

* while coming through the performance factors the value will be the following equation.

$$T = I_C \times CPS \times \bar{\tau}$$

* with future Manipulations the value changes accordingly and gets the following value such that the equation.

$$T = I_C \times (p + m \times k) \times \tau$$

where the Ic stands for instruction count.
p for processor time
m for memory time
k for the ratio b/w the processor and memory.

3> System Attributes;

* It is further divided into 4 types of system attributes and it is then compared with the memory time. processor time and ratio. of both
* However the attributes are Statiatically divided and enhanced particularly among other system attributes suchas
  * Memory hierarchy and cache
  * Data dependencies
  * Compiler technology
  * System attributes.

4> MIPS rate:-

* Here MIPS stands for million of instruction per second and how the MIPS Calculation is carried out
* The equation for the use of MIPS is given by the following.

$$MIPS = \frac{f \times CSA}{C \times 10^6}$$

5> Floating point operations per second:-

* Floating point operations per second are considered as the flops and Megabytes will be considered here such as (10^8) (10^6) and so on.

* it is the most important attributes for considering the performane of the System attribute

6) Throughput rate:

* Throughput is used to calculate the efficiency of the System and hence it is also a very important attrible for the consideration.

* Throughput rate is calculated using a particular formula and hence required performance is reached.

—6M

2.a Generations Of computers

1st Generations (1945 - 1954)

In 1st Gen. acording to architechure and software Single processing unit is used for Serial fixed point operations. vaccumtube. were used. machine / assembly language were used. branch instruction accumulator. Compiler were used no Subroutine Image were. provided

2nd Generations (1955 - 1964)

In 2nd generation, Index register floating point Operating, Multiplexed memory batch - processing monitors were used. HLL language was introduced. in this generation, Subroutine, libraries, were-used.

3rd Generation (1905 - 1974)

Microprogrammed Control was introduced in this generations. pipeline and Cache were used to fill gap between. CPU and main memory. Multiprogramming with multiple acess to memory was introduced integrated circuit were used, time sharing OS. was used.

4th Generation (1975 - 1990)

Parallel computers were implement during this generation using VLSI technologies multiprocessing, multitasking my were introduced

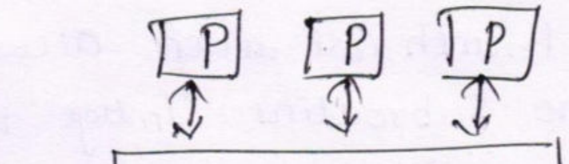
5th Generation (1991 - present)

During this: cluster computer, scalable processors were introduced, nanotechnology, advance VLSI, high-density packing, optical media were introduced, during 5th Gen. teraflops were used and now it crossed petaflops, hetrogeneous process were introd to solve large-scale problem on hetrogeneous networks.

— 7M

2b. Shared Memory Multiprocessors

① UMA



— 3M

In UMA model. Physical memory can be shared to multiple process. processors can access the memory work at same time.

② In NUMA The access time varies with the location of memory word, The memory is distributed locally processor called local memory & collective of local memory form Global space address

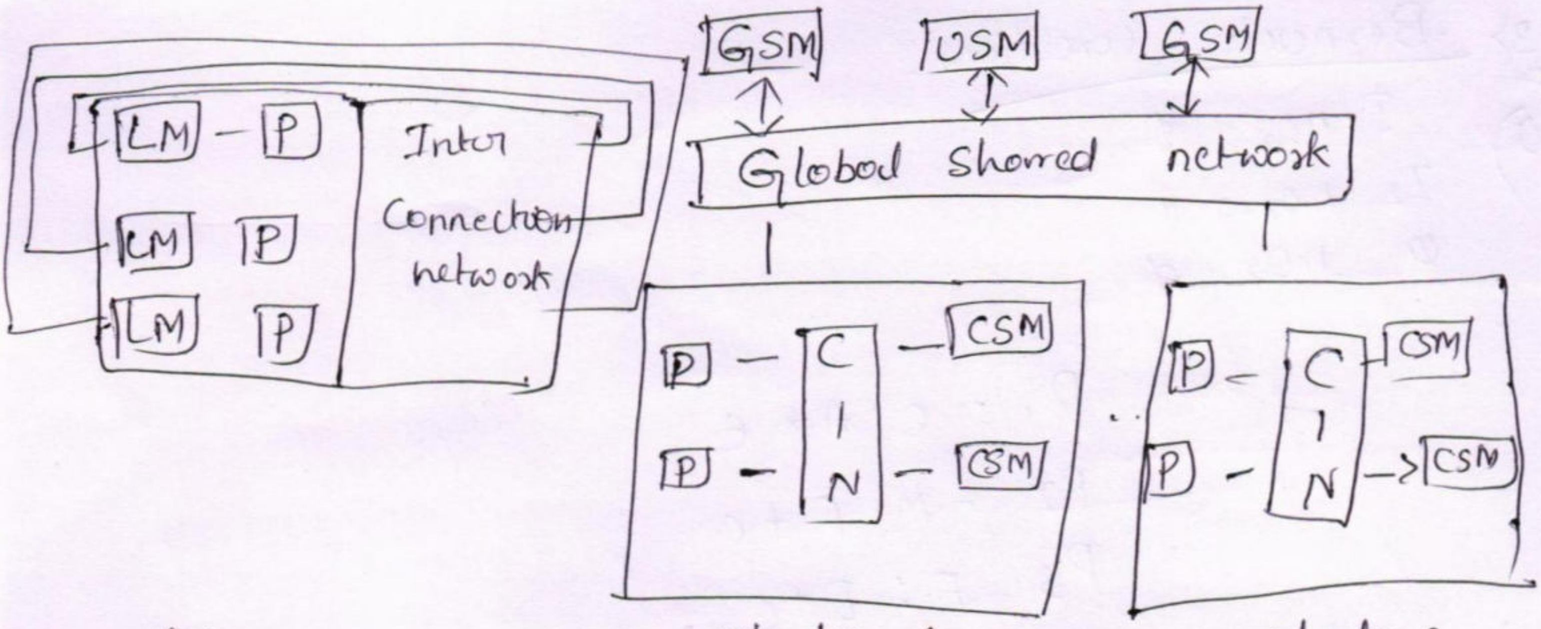
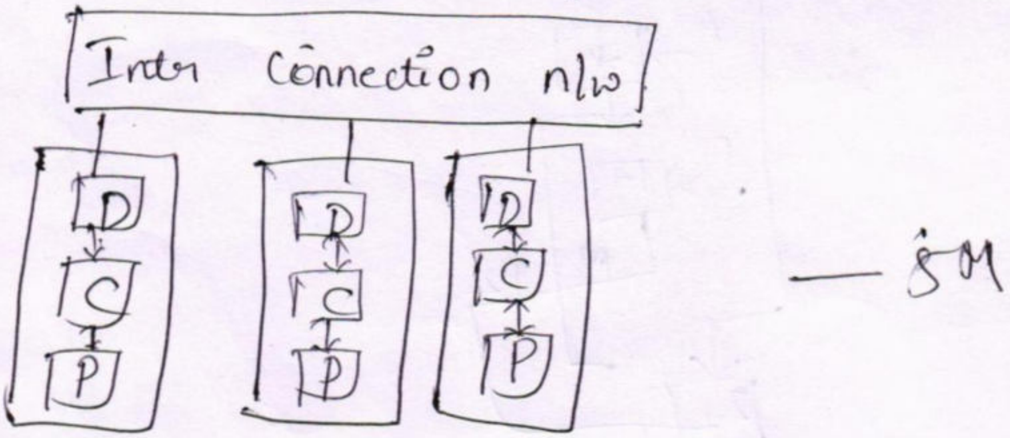


Fig. Shared memory

③ COMA (Cache - only memory access)



Coma is the Special case of NUMA, The processors does not have only hierarchy. The distributed shared memory one converted into cache. the distribute cache is assigted by the distributed directions. The local copy of cache is present in the directories.

3} -Bernetin conditions:

a) $I_1 \cap O_2 = \emptyset$

$I_2 \cap O_1 = \emptyset$

$O_1 \cap O_2 = \emptyset$

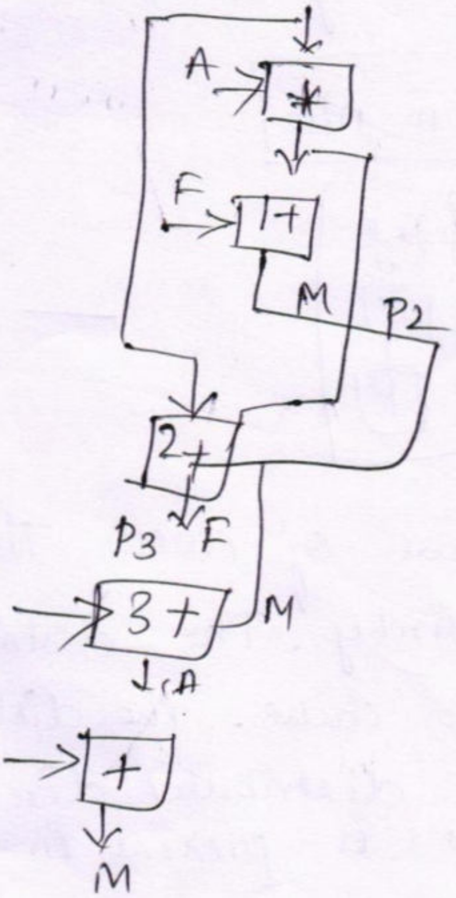
$P_1 = C: A * E$

$P_2 = M: F + C$

$P_3 \quad F: E + C$

$P_4 = M: M + E$

$P_5 = M: G \div G$



→ 7M

3b> * Explaine the connection network

* I 2-D Static Connection network — 4M

* In 3D Static connetion netwoork — 4M

Q2a) Control flow.

* computer computation token is indicated when instruction should be executed

Data flow

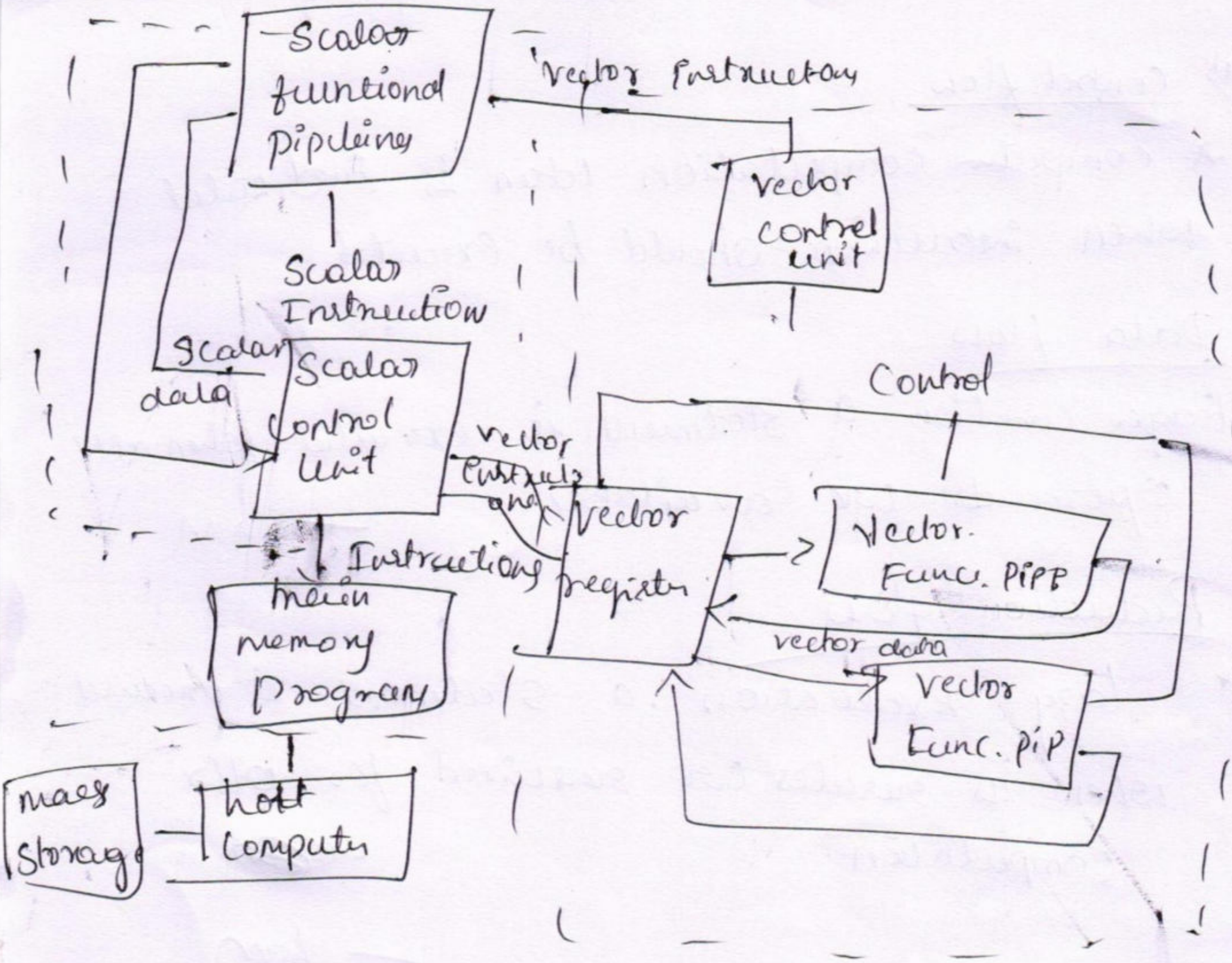
Eager evation a Statement is executed when all operands are available — 4M

Reduction flow

* lazy Evaluation . a statement is executed when its results are required for other computation.

— 4M

~~Q2b)~~ ~~Explain~~.



4b) SIMD Computers

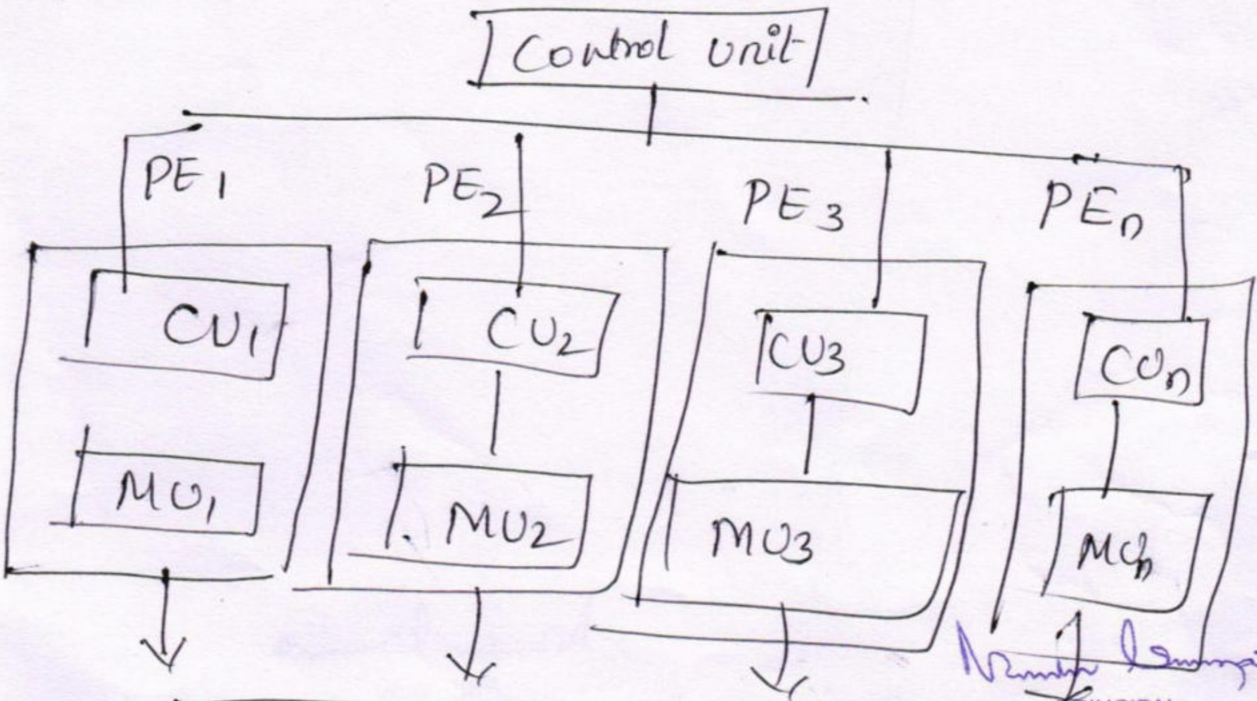


Diagram – 4M
Explanation – 3M

Sri Shridevi Charitable Trust (R)

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOG

Sira Road, Tumkur – 572 106. Karnataka.

DEPARTMENT OF COMPUTER SCIENCE AND ENGG.

INTERNAL ASSESMENT TEST: II
SUB : **Advanced computer Aechitecture (15CS72)**
SEM : VII

DATE:31/10/2018
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1 a. What are RISC scalar processors? Explain SUN Microsystems SPARC architecture with window registers. **7M[CO2]**

b. What are CISC scalar processors?Explain the architecture of digital equipment VAX 8600 processor. **8M[CO2]**

OR

2. a. With a neat diagram,Explain design Space of processors . **7M [CO2]**

b What are vector processors.Write a note on symbolic LISP Processors **8M[CO2]**

3. a. Write a note on VLIW architecture with a neat diagram explain a typical VLIW processor architecture and pipelining **7M[CO2]**

b. What are vector processors?Explain different vector instructions along with how pipelining is done in vector processors **8M[CO3]**

OR

4. a. What is paging?Explain paging using TLB. **7M[CO3]**

b Explain properties of Memory hierarchy. **8M[CO3]**

PRINCIPAL
SIET., TUMAKURU.

Shridevi Institute of Engineering & Technology

Department Of Computer Science & Engineering

II Internal - Scheme & Solution.

1 a. **RISC Scalar Processor.**

- It is the hardware Control unit
- RISC pushes the less frequently used Instructions into Software
- It has high clock rate & low CPI — 2M

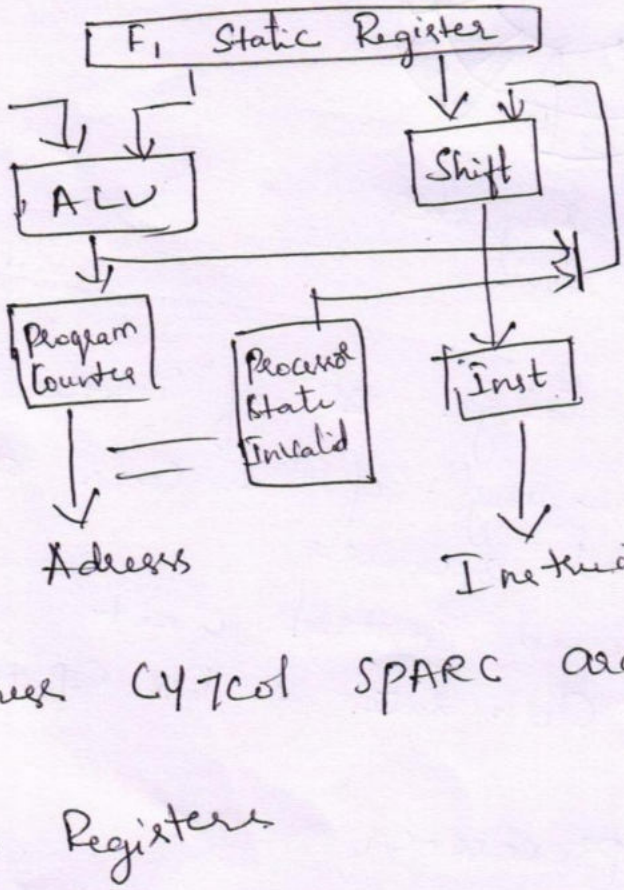


fig: Cypress CY7c01 SPARC architecture

Window Registers

- SPARC is a Scalar Processor Architecture
- Scalability because of use of window Register
- SPARC runs Each Instruction of 32 register.
- where 8 are Called global register & the remaing are called widow register

- Overloding of Instructions are done
- window registers are divided in to 3
  Ins, local & outs

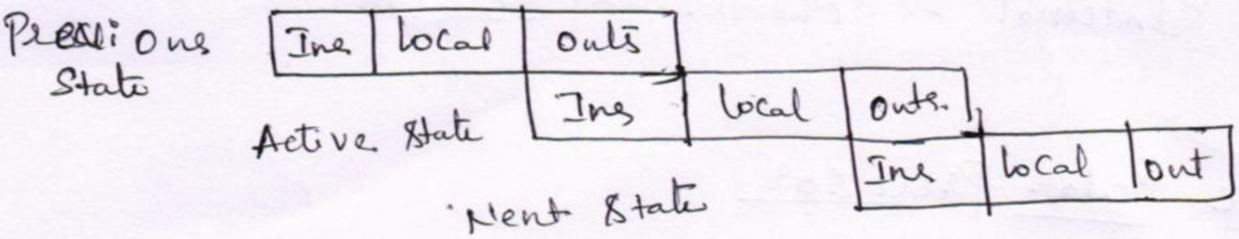


fig:- a

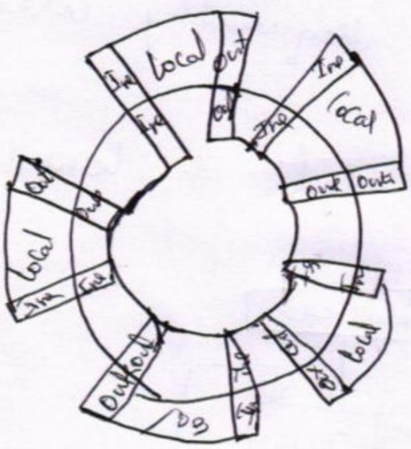


fig b

fig: window register

Design philosophy

-> As it uses the large no of instruction in the Hardware it the length of the code decreases the software overload decreases

->It as hardwared control unit

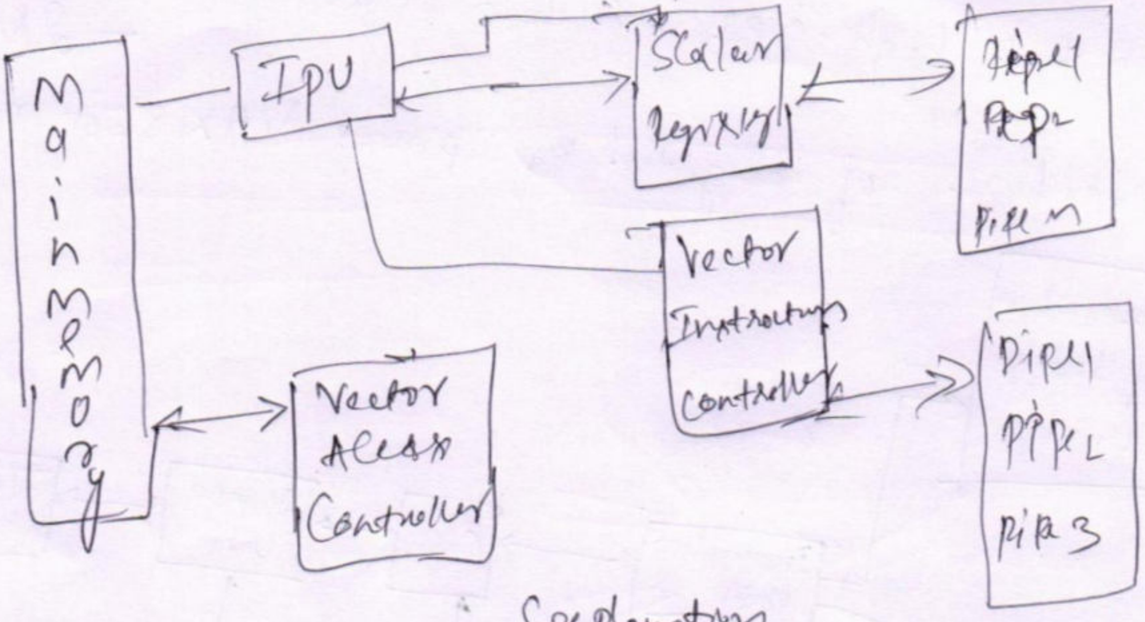
-> It has high clock rate & less CPI —5M

b) ·CISC Scalar processor

- A Scalar processor process the fixed point Integer Instructions
- Simple Scalar Processor : process only fixed point Integer Instructions

2.a) Space processor → Diagram – 4M

Explanation – 3M.



Explanation ← 3M

2.b)

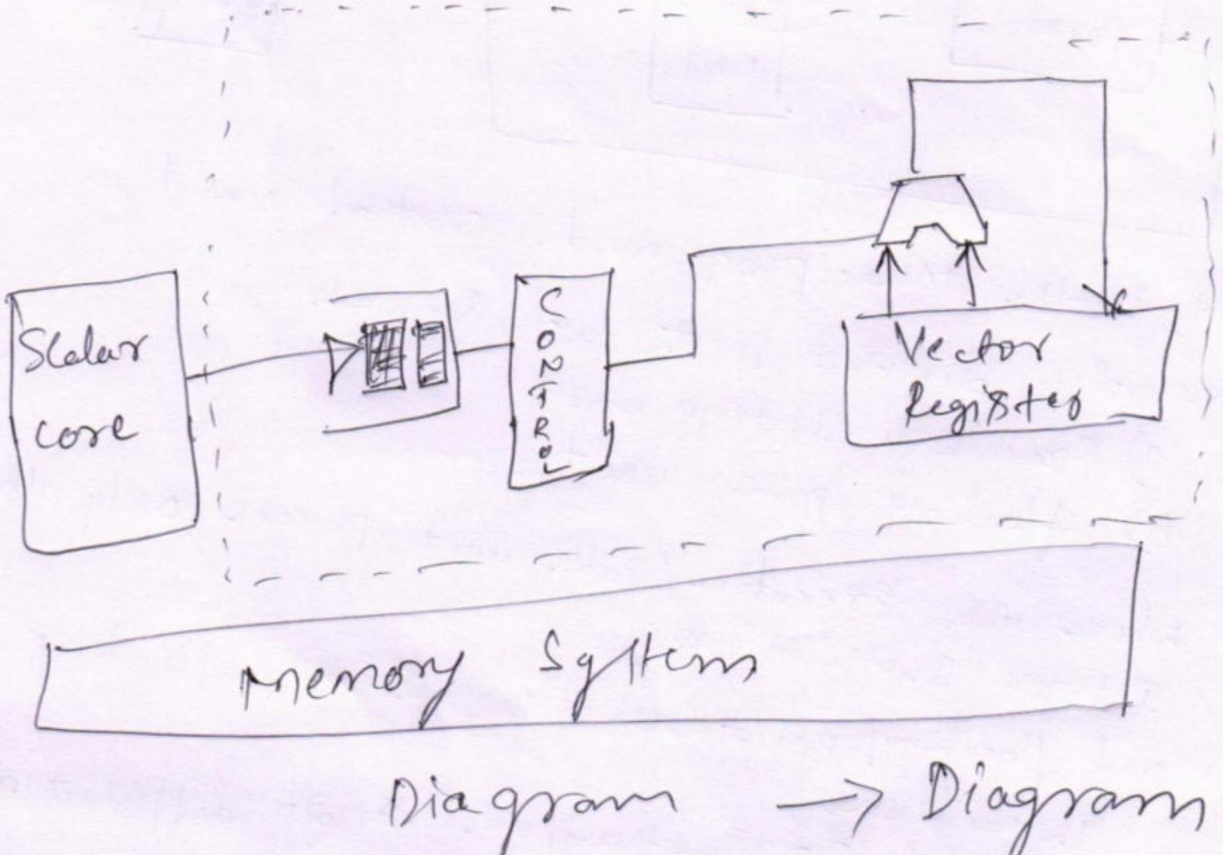


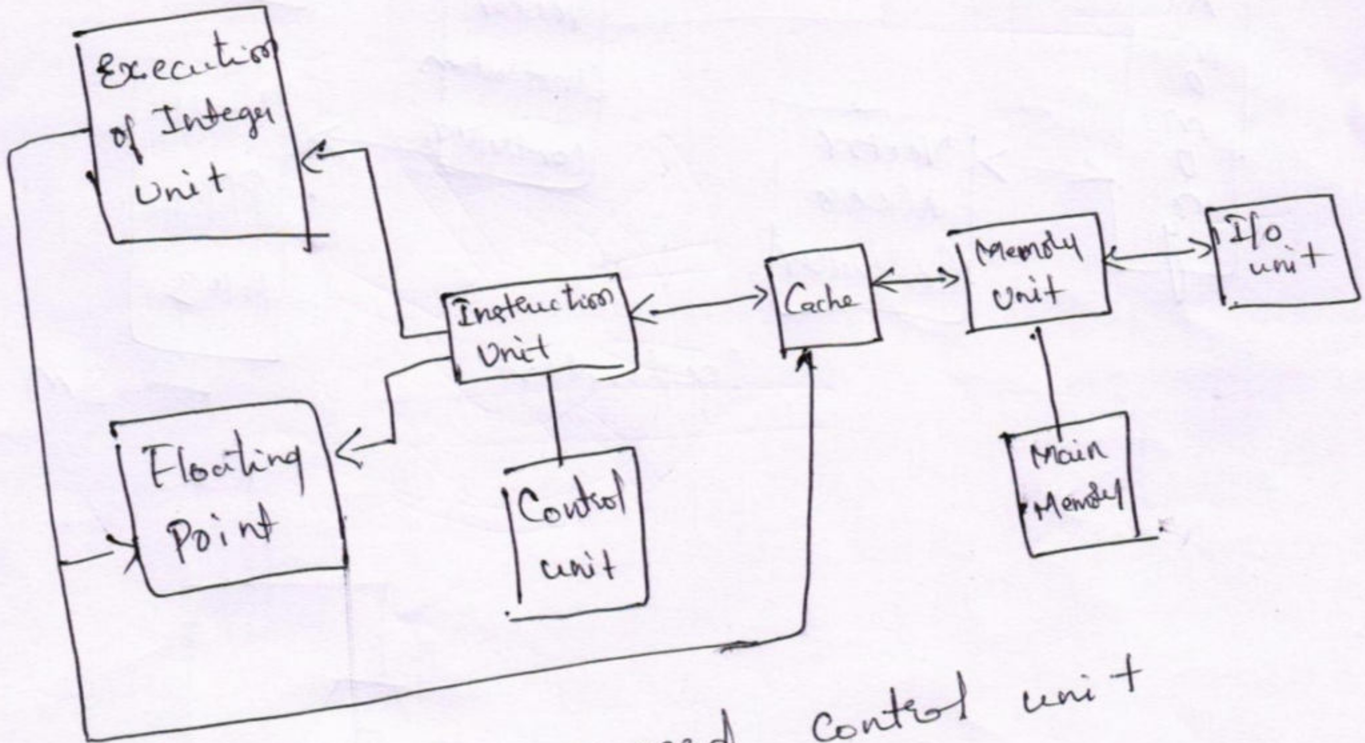
Diagram → Diagram 4M

Explanation → 4M

PRINCIPAL
SIET., TUMAKURU.

- Complex Scalar processor.
  - process both Integer Instruction set and floating point Instructions.
  - It has high CPI & low clock Rate — 2M

Architecture of digital Equipment VAX 8600 processor.



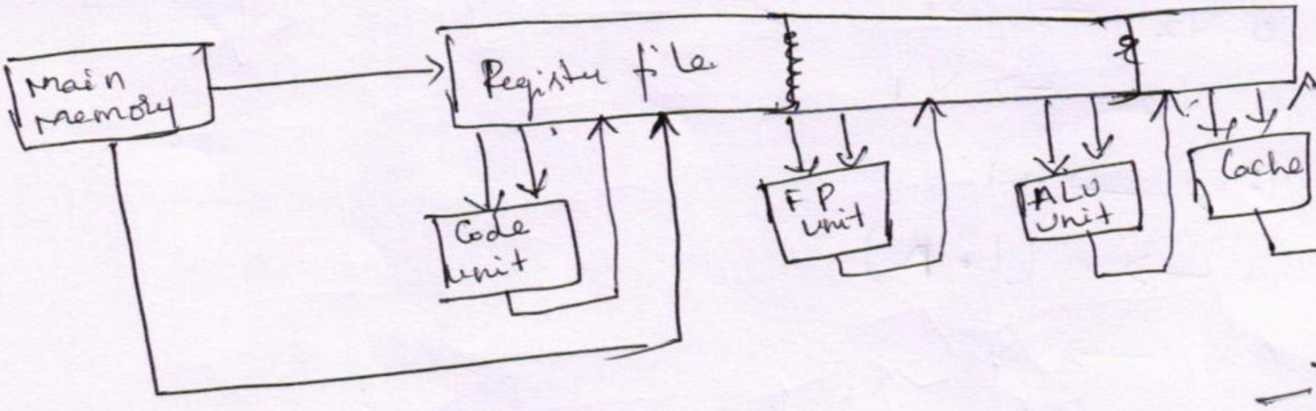
- It is the micro programmed control unit

* memory divided in to two sections
  a) Execution Integer unit
  b) floating point unit

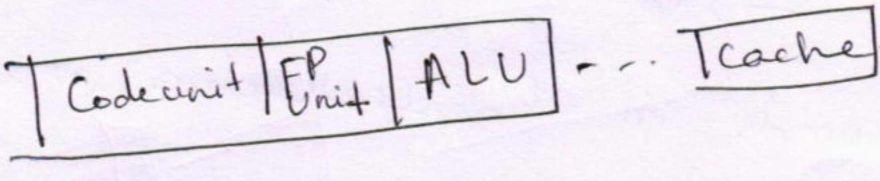
→ where the Execution/Inter unit process only the
→ Integer Instructions
→ and floating point unit process only floating point Instructions
→ It contains 300 Instructions & 20 different addressing modes
→ It is the unifixed cache memory where both data & Instructions are stored at one place
→ It has high CPI & low Clock rate — 6M

3) a VLIW architecture based on well Established Concepts : horizontal micRoCoding & Susper Scalar processors.

* multiple functions Can be used in VLIW Architecture
* All multiple functions Shares a common large Registee file
* The Instruction written in Shoot words can be Compacted together to form the large word
* The word in VLIW Consist lengt ~~of~~ hundred of bytes
* Data movements is been decided during run time



-7M



piplinening

* Each pipeline Consist the multiple function.
* The VLIW is different from super-Scalar process in following ways
1. The decoding of VLIW instruction word is better than Superscalar processor.
2. Code density is better in Super Scalar processor.
3. The CPI of VLIW is better than Super Scalars

All the operations are done through a deplicated pipline
* Datata movements is been decided during run time

3) b Vector processor are been designed to perform vector computations.

Vector processor having two methods register-to-register & memory-to-memory.

1. Vector Instructions

The register based Instruction we register-to-register method we denote vector register as V_i, Scalar register as S_1 and the memory array of length of n is $M(1:n)$

$V_1 \circ V_2 \rightarrow V_3$

$V_1 \circ V_2 \rightarrow S_1$

$S_1 \circ V_2 \rightarrow V_1$

$M(1:n) \rightarrow V$

$V \rightarrow M(1:n)$

$\circ V_1 \rightarrow S_1$

$S_1 \circ V_1 \rightarrow V_2$

The operands in the Instruction must have same length

The memory based list used memory-to-memory method

$M_1(1:n) \circ M_2(1:n) \rightarrow M(1:n)$

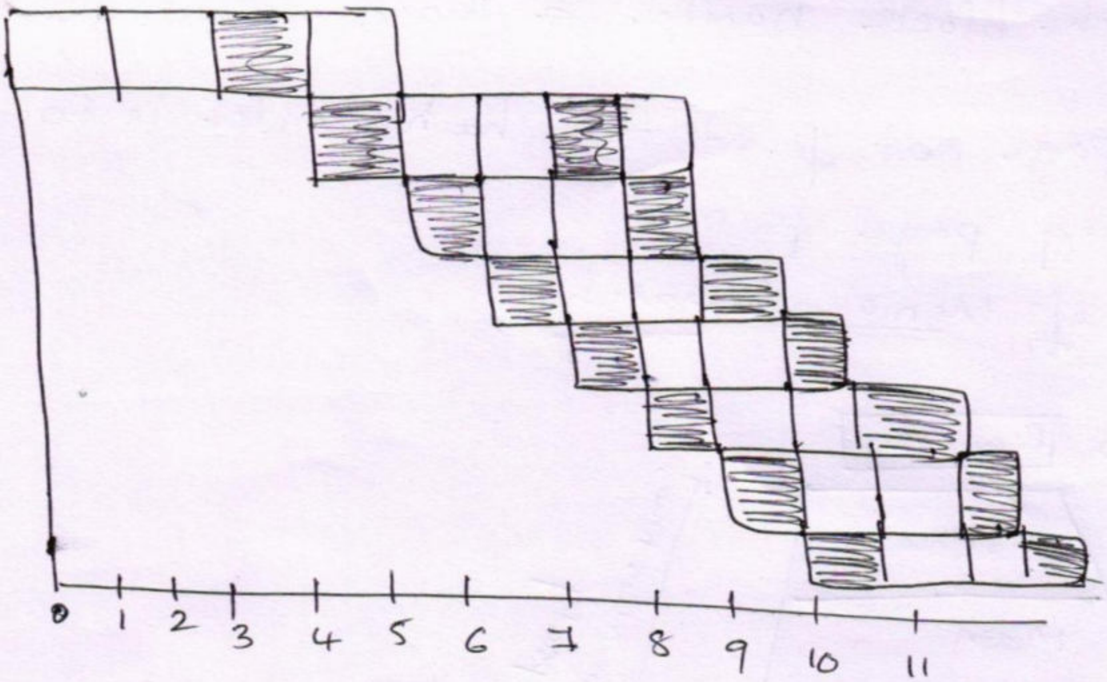
$\circ M_1(1:n) \rightarrow M_2(1:n)$

$M_1(1:n) \circ M_2(1:n) \rightarrow M(k)$ — 8M

$S_1 \circ M_2(1:n) \rightarrow M_1(1:n)$

The vector pipelines are attached to Superscalar processor or scalar processor.

The vector pipeline results are compared with scalar processor & vector processor.



4)

a) Paging :-

It Process of memory management where it retrival of data from the Secondary storage device to main memory for the Execution of Instructions — 2M.

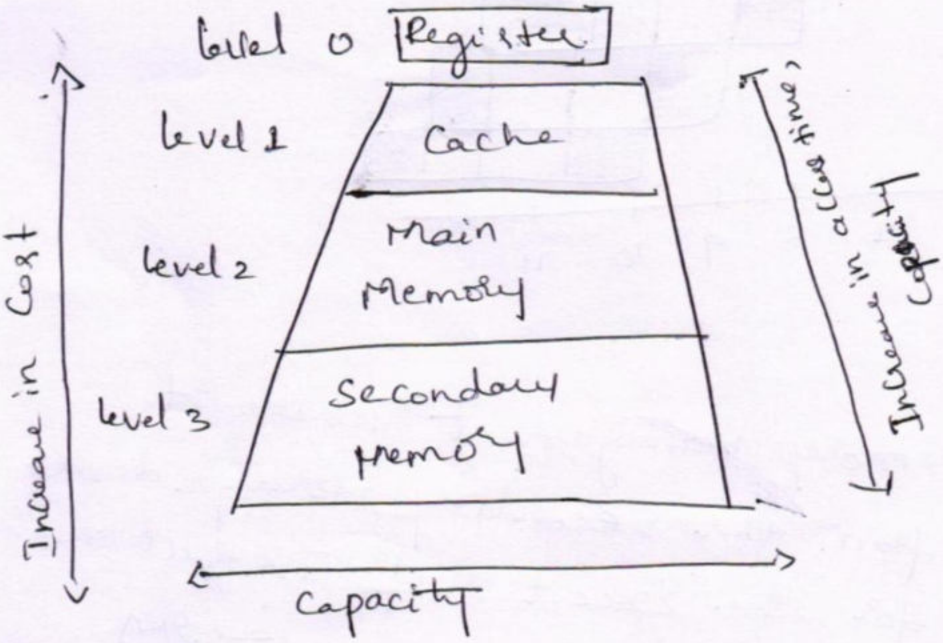
Paging Using TLB

- TLB is the high Speed page Table Entries
- mapping appears as TLB & paging
- TLB Stores Recently used page frame numbers
- Table Entering Consists of Page number & Page frame number
- Virtual address is divided into 3 :- first section Contains the page frame no
= Second Section Consist of Cache block no
- Third Section consist of word address
- The key Strategy used in searching a page is by using page frame
- If the page present in same working set the It will be translated.

— 5M

- And the Cache block number & word address are Copied
- If the page not found the hash pointer is to search using page frame

b) Properties of memory hierarchy



— HM

properties.

1) Inherence property :-

- It is stated as $M_1C_1, M_2, C_2 --- M_nC_n$. all the Information are stored at outer level M_n.
- Frequenty used data are stored at lower level so as to reduce the access time.
- If info in m_i is copied, similarly M_{i-1} copies to M_{i-2}
- If the Information in M_i is modified then it can update later
- Cache is divided in to 32 bytes.
- memory is divided in to pges of 4 bytes

* The Scattered pages are orgained in to Segments.
* The size of the segment may vary w.r.t instructions

Coherence Property

* Coherence property is the property where information at all the level should be consistent

* If Information of M_i is modified then imdiately contents at the all the level should be update

* their Exist two stratergy in maintaing Coherence property

1) Write through :-

where it allows data should be update first & later modification

2) write back :-

* where this allows the data to modify first & later update the data

* In write through memory space usage is less as the data is updated.

* In write back memory space usage is more

— 4M

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
INTERNAL ASSESMENT TEST: III

An ISO 9001:2015 Certified Institution

SUB : Advanced Computer Arcitetutre-15CS72
SEM : VII Sem

MAX MARKS : 30
DATE&TIME : 28/11/18,75min

NOTE : Answer any **TWO** full questions.

1.a) Write a note on message passing routing schemes. **8M[C03]**
b) Write a note on hardware synchronization mechanisms. **7M [C03]**

OR

2. a) Write a note on dataflow and hybrid architecture. **8M[C03]**
b) Write a note on Fine grain Multi Computers **7M[C03]**

3. a) Explain Tomosulos Algorithm **8M [C03]**

b)Write limitations of Exploiting Instruction level parallelism **7M[C03]**

OR

4 .a). Explain Features and parallel language Constructs. **8M[C03]**
b). Write a note on code optimization and Scheduling. **7M[C03]**

PRINCIPAL
SIET., TUMAKURU.

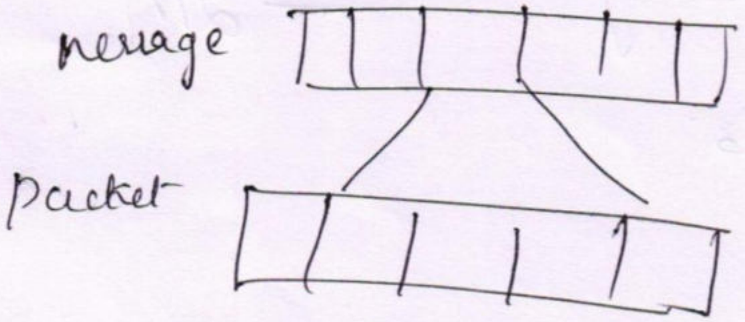
Shridevi Institute of Engineering & Technology.

Depoortment of CSE.

IA-TEST - III

① a> Messag passing routing — 4M

Message Format :



D | D | D | R | S |

wher D . R S
D -> Data only fit
R -> Roaling data
S -> Sequence number

* Store forwarding Routing — 4m.

b> * worm hole routing :-

b> * Asyhronous pipling.

* latincy Analysis. — 7M

2} a> write a diagram and hybrid . architecture — 8M

b> note on fine grain Multi. computers. — 7M

3> a> Explain the Tomorculos Algorithm.
Diagram → 4M
Explanation → 4M

b> write Limitation of Exploiting Instruction level parallelism
Diagram → 4M
Explanation → 4M

4> a> Features of parallel language constructs

* Forton 99 array — 2M

$c_1 * c_2 * c_3$

$c_1 = c_2$

$c_1 = *$

$+$

c_1

* Program flow control → 2M

* MIT J Machine → 2M

* COSMIC C → 2M

4.b> * code optimization & Scheduling

* Scalar optimization with basic units — 2M

* local & global optization → 2M

* vectorization & parallelizing — 2M

* code generation & scheduling — 2M

PRINCIPAL
SIET. TUMAKURU.

2018-19

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

INTERNAL ASSESMENT TEST: I
SUB : Computer Networks (15CS52)
SEM : V

Date: 20/09/2018
MAX MARKS : 30
TIME : 75 min

NOTE: Answer any 2 full questions

1. a. Explain briefly about Network Applications Architectures with a neat diagram. 7M
b.Explain the Transport services available to application layer. 8M

OR

2. a. Draw and explain the HTTP request and response message format. 8M
b.Describe the socket programming with TCP. 7M

3. a. Explain briefly about Electronic mail. 7M
b.What is cookies? Explain with diagram how cookies stores user state information. 8M

OR

4. a. Explain mail access protocol – POP3. 7M
b. Explain the 3 classes of DNS servers organized in hierarchy. 8M

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

INTERNAL ASSESMENT TEST: I
SUB : Computer Networks (15CS52)
SEM : V

Date: 20/09/2018
MAX MARKS : 30
TIME : 75 min

NOTE: Answer any 2 full questions

1. a. Explain briefly about Network Applications Architectures with a neat diagram. 7M
b.Explain the Transport services available to application layer. 8M

OR

2. a. Draw and explain the HTTP request and response message format. 8M
b.Describe the socket programming with TCP. 7M

3. a. Explain briefly about Electronic mail. 7M
b.What is cookies? Explain with diagram how cookies stores user state information. 8M

OR

4. a. Explain mail access protocol – POP3. 7M
b. Explain the 3 classes of DNS servers organized in hierarchy. 8M

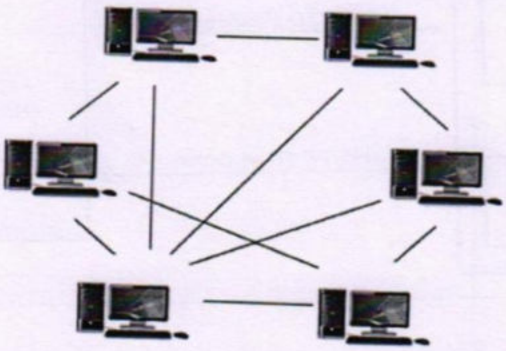
PRINCIPAL
SIET, TUMAKURU

Internal Assesment test: 1

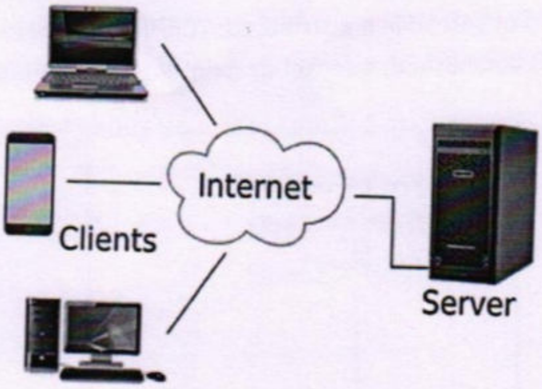
Computer networks (15cs52)

1. A) The two types of network architectures are used **(7m)**

- Peer-To-Peer network
- Client/Server network



Peer-To-Peer



Client/server

1. b.) We can broadly classify the possible services along four dimensions: reliable data transfer, throughput, and security. (8M)

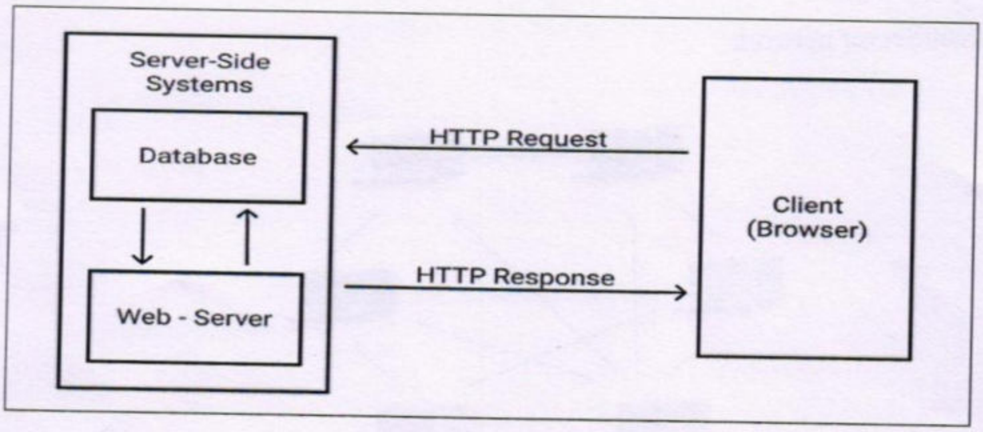
One important service that a transport-layer protocol can potentially provide to an application is process-to-process reliable data transfer. When a transport protocol provides this service, the sending process can just pass its data into the socket and know with complete confidence that the data will arrive without errors at the receiving process.

Application layer throughput is usually measured in kilobytes or megabytes per second. If necessary, work with your customer to identify application throughput problems caused by errors or inefficiencies in protocols, operating systems, and applications. Protocol analyzers are important tools for this.

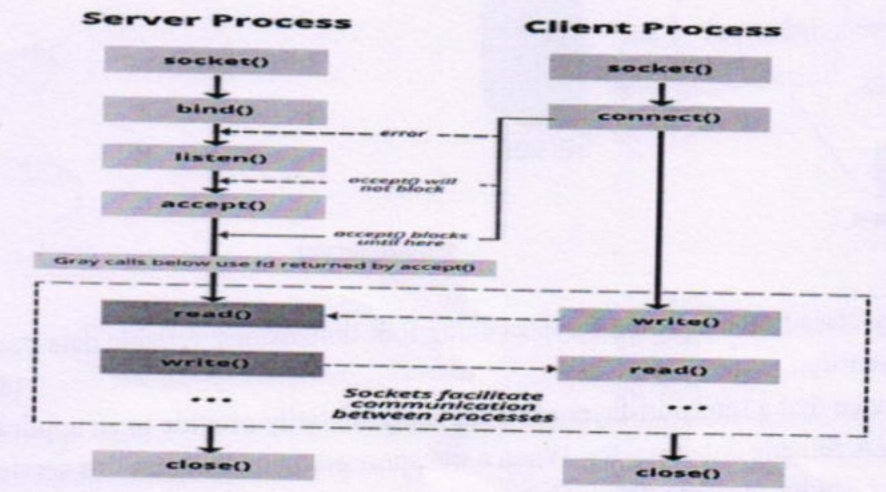
Application layer security refers to ways of protecting web applications at the application layer (layer 7 of the OSI model) from malicious attacks. Since the application layer is the closest layer to the end user, it provides hackers with the largest threat surface.

2.a)

(8M)



b.) A socket programming interface provides the routines required for interprocess communication between applications, either on the local system or spread in a distributed, TCP/IP based network environment. Once a peer-to-peer connection is established, a socket descriptor is used to uniquely identify the connection.



State diagram for server and client model of Socket

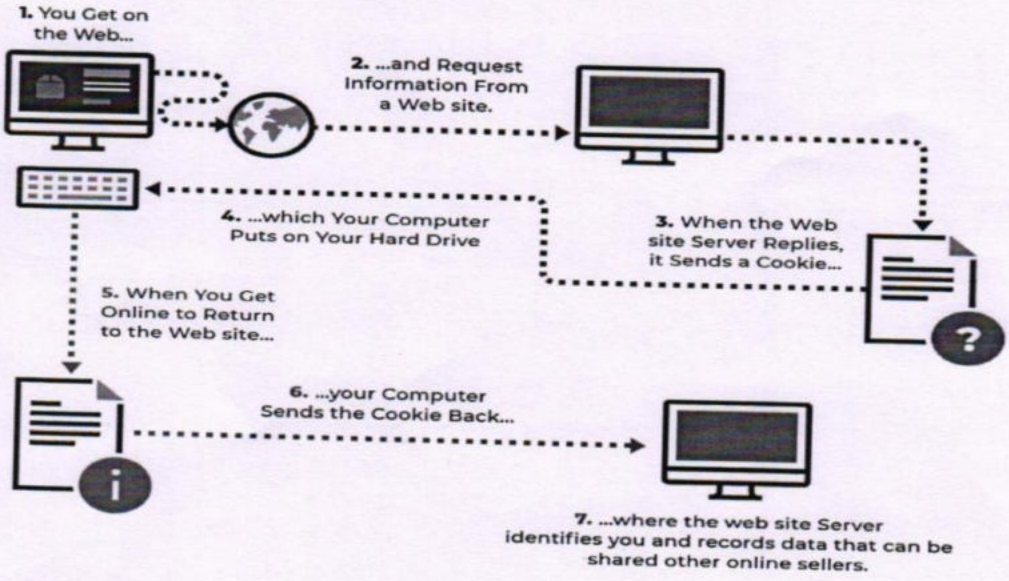
(7M)

3 a) Email (electronic mail) is the exchange of computer-stored messages from one user to one or more recipients via the internet. Emails are a fast, inexpensive and accessible way to communicate for business or personal use.

1. An email address: This is a unique identifier for each user, typically in the format of name@domain.com.
2. An email client: This is a software program used to send, receive and manage emails, such as Gmail, Outlook, or Apple Mail.
3. An email server: This is a computer system responsible for storing and forwarding emails to their intended recipients.

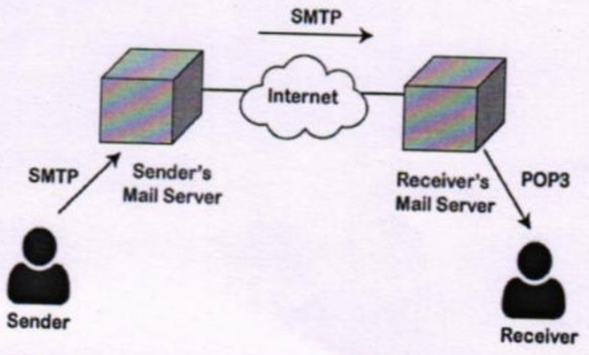
(7M)

b.) A cookie is a piece of data from a website that is stored within a web browser that the website can retrieve at a later time. Cookies are used to tell the server that users have returned to a particular website.


1. You Get on the Web...
2. ...and Request Information From a Web site.
3. When the Web site Server Replies, it Sends a Cookie...
4. ...which Your Computer Puts on Your Hard Drive
5. When You Get Online to Return to the Web site...
6. ...your Computer Sends the Cookie Back...
7. ...where the web site Server identifies you and records data that can be shared other online sellers.

(8M)

4. a)



mail access protocol-pop3 (7m)

b) **There are three main kinds of DNS Servers — primary servers, secondary servers, and caching servers.**

- Primary Server. The primary server is the authoritative server for the zone. ...
- Secondary Servers. Secondary servers are backup DNS Servers. ...
- Caching Servers.

(8M)

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB :WEB TECHNOLOGY AND ITS APPLICATIONS[15CS71]
SEM : VII

year: 18-19 odd
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	What is HTML and Where did it come from and Structure of HTML Document?	7M	CO1
	b	Explain HTML Syntax and Semantic Markup?	8M	CO1
OR				
2	a	Explain Quick Tour of HTML Elements and HTML5 Semantic Structure Elements?	7M	CO1
	b	Explain CSS Syntax and Location of Styles?	8M	CO1
3	a	Briefly explain the Tables and Styling Tables?	7M	CO1
	b	Explain the Form Control Elements and Table and Form Accessibility?	8M	CO1
OR				
4	a	Explain Layout and Normal Flow and Positioning Elements?	7M	CO2
	b	Explain Floating Elements and Constructing Multicolumn Layouts?	8M	CO2

PRINCIPAL
SIET., TUMAKURU.

18-19-odd.
WTA

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I **Scheme and Solutions** **year: 18-19 odd**
SUB :WEB TECHNOLOGY AND ITS APPLICATIONS[15CS71] **MAX MARKS** :30
SEM : VII **TIME** : 75 min

1	a	What is HTML and Where did it come from-2M and Structure of HTML Document-%m	7M	CO1
	b	Explanation HTML Syntax-3M and Semantic Markup-5M	8M	CO1
		OR		
2	a	Explanation Quick Tour of HTML Elements-2M and HTML5 Semantic Structure Elements-5M	7M	CO1
	b	Explanation CSS Syntax-3M and Location of Styles-5M	8M	CO1
3	a	Briefly explanation the Tables-2M and Styling Tables-5M	7M	CO1
	b	Explanation the Form Control Elements-3M and Table and Form Accessibility-5M	8M	CO1
		OR		
4	a	Explanation Layout and Normal Flow-2M and Positioning Elements-5M	7M	CO2
	b	Explanation Floating Elements-3M and Constructing Multicolumn Layouts-5M	8M	CO2

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI
EDUCATION

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB :WEB TECHNOLOGY AND ITS APPLICATIONS[15CS71]
SEM : VII

year: 18-19 odd
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	Briefly explain the Tables and Styling Tables?	7M	CO2
	b	Explain the Form Control Elements and Table and Form Accessibility?	8M	CO2
OR				
2	a	Explain Layout and Normal Flow and Positioning Elements?	7M	CO2
	b	Explain Floating Elements and Constructing Multicolumn Layouts?	8M	CO2
3	a	What is JavaScript and What can it do? And JavaScript Design Principles?	7M	CO3
	b	Explain Syntax and JavaScript Objects?	8M	CO3
OR				
4	a	Explain The Document Object Model (DOM) and JavaScript Events?	7M	CO3
	b	Explain A Web Server's Responsibilities and Quick Tour of PHP?	8M	CO3

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II **Scheme and Solutions** **year: 18-19 odd**
SUB :WEB TECHNOLOGY AND ITS APPLICATIONS[15CS71] **MAX MARKS** :30
SEM : VII **TIME** : 75 min

1	a	Briefly explanation the Tables-2M and Styling Tables-5M	7M	CO2
	b	Explanation the Form Control Elements-3M and Table and Form Accessibility-5M	8M	CO2
		OR		
2	a	Explanation Layout and Normal Flow-2M and Positioning Elements-5M	7M	CO2
	b	Explanation Floating Elements-3M and Constructing Multicolumn Layouts-5M	8M	CO2
3	a	What is JavaScript and What can it do?-2M And JavaScript Design Principles-5M	7M	CO3
	b	Explanation Syntax-3M and JavaScript Objects-5M	8M	CO3
		OR		
4	a	Explanation The Document Object Model (DOM)-2M and JavaScript Events-5M	7M	CO3
	b	Explain A Web Server's Responsibilities-3M and Quick Tour of PHP-5M	8M	CO3

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III
SUB :WEB TECHNOLOGY AND ITS APPLICATIONS[15CS71]
SEM : VII

year: 18-19 odd
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	Explain PHP Arrays and Superglobals and Arrays, $_GET and $_POST Superglobal Arrays?	7M	CO4
	b	Explain $_SERVER Array and $_Files Array?	8M	CO4
		OR		
2	a	Explain Reading/Writing Files and PHP Classes and Objects?	7M	CO4
	b	Explain The Classes and Objects in PHP and Object Oriented Design?	8M	CO4
3	a	Explain The Problem of State in Web Applications and Passing Information via Query Strings?	7M	CO5
	b	Explain Passing Information via the URL Path and Cookies?	8M	CO5
		OR		
4	a	Explain Serialization and Session State?	7M	CO5
	b	Explain HTML5 Web Storage, Caching and Advanced JavaScript and jQuery?	8M	CO5

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III Scheme and Solutions **year: 18-19 odd**
SUB :**WEB TECHNOLOGY AND ITS APPLICATIONS[15CS71]** **MAX MARKS** :30
SEM : VII **TIME** : 75 min

1	a	Explanation PHP Arrays and Superglobals-2M and Arrays, $_GET and $_POST Superglobal Arrays-5M	7M	CO4
	b	Explanation $_SERVER Array-3M and $_Files Array-5M	8M	CO4
		OR		
2	a	Explanation Reading/Writing Files-2M and PHP Classes and Objects-5M	7M	CO4
	b	Explanation The Classes and Objects in PHP-3M and Object Oriented Design-5M	8M	CO4
3	a	Explanation The Problem of State in Web Applications-2M and Passing Information via Query Strings-5M	7M	CO5
	b	Explanation Passing Information via the URL Path-3M and Cookies-5M	8M	CO5
		OR		
4	a	Explanation Serialization-2M and Session State-5M	7M	CO5
	b	Explanation HTML5 Web Storage, Caching-3M and Advanced JavaScript and jQuery-5M	8M	CO5

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

FS 543667

INTERNAL ASSESMENT TEST: I
SUB :UNIX AND SHELL PROGRAMMING[17CS35]
SEM : III

year: 18-19 odd
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	Explain Unix Components/Architecture and Features of Unix?	7M	CO1
	b	Explain The UNIX Environment and UNIX Structure and Posix and Single Unix specification?	8M	CO1
		OR		
2	a	Explain General features of Unix commands/ command structure and Command arguments and options?	7M	CO1
	b	Explain Managing the non-uniform behaviour of terminals and keyboards and The root login?	8M	CO1
3	a	Briefly explain the Basic file types/categories and Organization of files?	7M	CO1
	b	Explain the Standard directories and Parent child relationship?	8M	CO1
		OR		
4	a	Explain the relative and absolute permissions changing methods?	7M	CO2
	b	Explain parent directories and their usage in relative path names?	8M	CO2

PRINCIPAL
SIET., TUMAKURU.

18-19-odd
USP

SHRIDEVI
EDUCATION

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB :UNIX AND SHELL PROGRAMMING[17CS35]
SEM : III

year: 18-19 odd
MAX MARKS :30
TIME : 75 min

SCHEME AND SOLUTIONS

1	a	Explanation Unix Components/Architecture- ardware: Hardware is the most simple and least powerful layer in the Unix Architecture. ... Kernel: This is the most powerful layer of the Unix architecture. ... Shell: We understood the importance of the kernel and that it handles most of the important and complex tasks of Unix OS. -2M and Features of Unix-5M	7M	CO1
	b	Explanation The UNIX Environment and UNIX Structure- UNIX is an operating system consisting of three important features; a kernel, the shell and a file system. As its name implies, the kernel is at the core of each UNIX system and is loaded in whenever the system is started up - referred to as a boot of the system. -3M and Posix and Single Unix specification-5M	8M	CO1
		OR		
2	a	Explanation General features of Unix commands/ command structure- Multiuser System. ... Portability. ... Hierarchical File System. ... UNIX Toolkit. ... Program Execution. ... Multitask system. ... Pattern Matching. ... The Building-Block Approach -2M and Command arguments and options-5M	7M	CO1
	b	Explanation Managing the non-uniform behaviour of terminals-3M and keyboards and The root login?-5M	8M	CO1
3	a	Briefly explanation the Basic file types/categories- Portable document format (PDF) A PDF file is a common file type in many work environments. ... Word document (DOC and DOCX) ... Hypertext markup language (HTML and HTM) ... Microsoft excel spreadsheet file (XLS and XLSX) ... Text file (TXT) -2M and Organization of files-5M	7M	CO1
	b	Explanation the Standard directories-3M and Parent child relationship-5M	8M	CO1
		OR		
4	a	Explanation the relative-2M and absolute permissions changing methods-5M	7M	CO2
	b	Explanation parent directories-3M and their usage in relative path names- Relative path names are used to specify the name of a file in the current directory or the path name of a file or directory above or below the level of the current directory in the file system. -5M	8M	CO2

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI EDUCATION

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB :UNIX AND SHELL PROGRAMMING[17CS35]
SEM : III

year: 18-19 odd
MAX MARKS:30
TIME : 75 min

Note: Answer Two full Questions

1	a	Briefly explain the Basic file types/categories and Organization of files?	7M	CO2
	b	Explain the Standard directories and Parent child relationship?	8M	CO2
		OR		
2	a	Explain the relative and absolute permissions changing methods?	7M	CO2
	b	Explain parent directories and their usage in relative path names?	8M	CO2
3	a	Explain Input mode commands and Command mode commands?	7M	CO3
	b	Explain Different ways of invoking and quitting vi and Different modes of vi?	8M	CO3
		OR		
4	a	Explain The ex mode commands and Illustrative examples Navigation commands?	7M	CO3
	b	Explain The set, map and abbr commands and Simple examples using these commands?	8M	CO3

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI
EDUCATION

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II **year: 18-19 odd**
SUB :UNIX AND SHELL PROGRAMMING[17CS35] **MAX MARKS** :30
SEM : III **TIME** : 75 min

SCHEME AND SOLUTIONS

1	a	Briefly explanation the Basic file types/categories-2M and Organization of files- The term "file organization" refers to the way in which data is stored in a file and, consequently, the method(s) by which it can be accessed. This COBOL system supports three file organizations: sequential, relative and indexed -5M	7M	CO2
	b	Explanation the Standard directories--3M and Parent child relationship- The Parent-Child Relationship is one that nurtures the physical, emotional and social development of the child. It is a unique bond that every child and parent will can enjoy and nurture. This relationship lays the foundation for the child's personality, life choices and overall behaviour -5M	8M	CO2
		OR		
2	a	Explanation the relative-2M and absolute permissions changing methods You can use the chmod command to set permissions in either of two modes: Absolute Mode - Use numbers to represent file permissions (the method most commonly used to set permissions). When you change permissions by using the absolute mode, represent permissions for each triplet by an octal mode number. --5M	7M	CO2
	b	Explanation parent directories-3M and their usage in relative path names-5M	8M	CO2
3	a	Explanation Input mode commands-2M and Command mode commands-5M	7M	CO3
	b	Explanation Different ways of invoking-3M and quitting vi and Different modes of vi- While using vi, at any one time you are in one of three modes of operation. These modes are known as "command mode," "insert mode," and "last line mode." When you start up vi, you are in "command mode." This mode allows you to use certain commands to edit files or to change to other modes. -5M	8M	CO3
		OR		
4	a	Explanation The ex mode commands-2M and Illustrative examples Navigation commands- Navigation commands are those commands in Selenium that are used to perform different operations such as backward, forward, refresh, wait, etc in the browser's history. These commands can be accessed by creating a driver object using the reference variable of WebDriver just like browser methods. -5M	7M	CO3
	b	Explanation The set, map and abbr commands-3M and Simple examples using these commands-5M	8M	CO3

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III
SUB : UNIX AND SHELL PROGRAMMING[17CS35]]
SEM : III

year: 18-19 odd
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	Explain The profile Read and readonly commands and Command line arguments?	7M	CO4
	b	Explain exit and exit status of a command and Logical operators for conditional execution?	8M	CO4
		OR		
2	a	Explain The if, while, for and case control statements and The set and shift commands and handling positional parameters?	7M	CO4
	b	Explain The Simple shell program examples and File inodes and the inode structure?	8M	CO4
3	a	Explain The Parent and child process and The ps command with its options?	7M	CO5
	b	Explain The nice and nohup commands and Background processes?	8M	CO5
		OR		
4	a	Explain Structure of a perl script and Running a perl script?	7M	CO5
	b	Explain The range operator and Chop() and chomp() functions?	8M	CO5

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: IIII
SUB : UNIX AND SHELL PROGRAMMING[17CS35]
SEM : III

year: 18-19 odd
MAX MARKS :40
TIME : 75 min

SCHEME AND SOLUTIONS

1	a	Explanation The profile Read and readonly commands-2M and Command line arguments- Command line arguments are nothing but simply arguments that are specified after the name of the program in the system's command line, and these argument values are passed on to your program during program execution -5M	7M	CO4
	b	Explanation exit and exit status of a command-3M and Logical operators for conditional execution?-5M	8M	CO4
		OR		
2	a	Explanation The if, while, for and case control statements-2M and The set and shift commands- The shift command changes the values of the batch parameters %0 through %9 by copying each parameter into the previous one—the value of %1 is copied to %0, the value of %2 is copied to %1, and so on. This is useful for writing a batch file that performs the same operation on any number of parameters - and handling positional parameters- A positional parameter is an argument specified on the command line, used to launch the current process in a shell. Positional parameter values are stored in a special set of variables maintained by the shell. -5M	7M	CO4
	b	Explanation The Simple shell program examples-3M and File inodes and the inode structure?-5M	8M	CO4
3	a	Explanation The Parent and child process-2M and The ps command with its options?-5M	7M	CO5
	b	Explanation The nice and nohup commands-3M and Background processes- Background processes are mini-programs that perform a specific task on your computer. They run without user input and are designed to complement other programs. These programs monitor your system, schedule updates, run backups, and provide other essential services -5M	8M	CO5
		OR		
4	a	Explanation Structure of a perl script-2M and Running a perl script- **Execute the script using the following syntax options:** perl.exe <script name> [script arguments] <Alternate_Perl_Interpreter_Path>/perl.exe <script name> [script arguments -5M	7M	CO5
	b	Explanation The range operator-3M and Chop() and chomp() functions- Perl's chop and chomp functions can often be a source of confusion. Not only do they sound similar, they do similar things. Unfortunately, there is a critical difference—chop removes the last character of the string completely, while chomp only removes the last character if it is a newline. -5M	8M	CO5

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB :CG&V[15CS62]
SEM :VI

year: 18-19 even
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	With a neat diagram explain the color CRT monitors and flat panel	7M	CO1
	b	Write the differences between random scan and raster scan displays	8M	CO1
		OR		
2	a	displays List and explain any 6 applications of computer graphics	7M	CO1
	b	Briefly explain the Bresenham's line drawing algorithm. Derive the expression for decision parameter?	8M	CO1
3	a	For the given endpoints (5,10) and (10,20) Find all the (x,y) points using DDA algorithm ?	7M	CO1
	b	Explain the Bresenham's midpoint circle drawing algorithm and derive the equation for decision parameter ?	8M	CO1
		OR		
4	a	Briefly explain the DDA line drawing algorithm?	7M	CO2
	b	What are vertex arrays? Write an Open GL program to draw a color cube and spin it using OpenGL transformation matrices?	8M	CO2

PRINCIPAL
SIET., TUMAKURU

18-19-even
CG

SHRIDEVI
EDUCATION

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

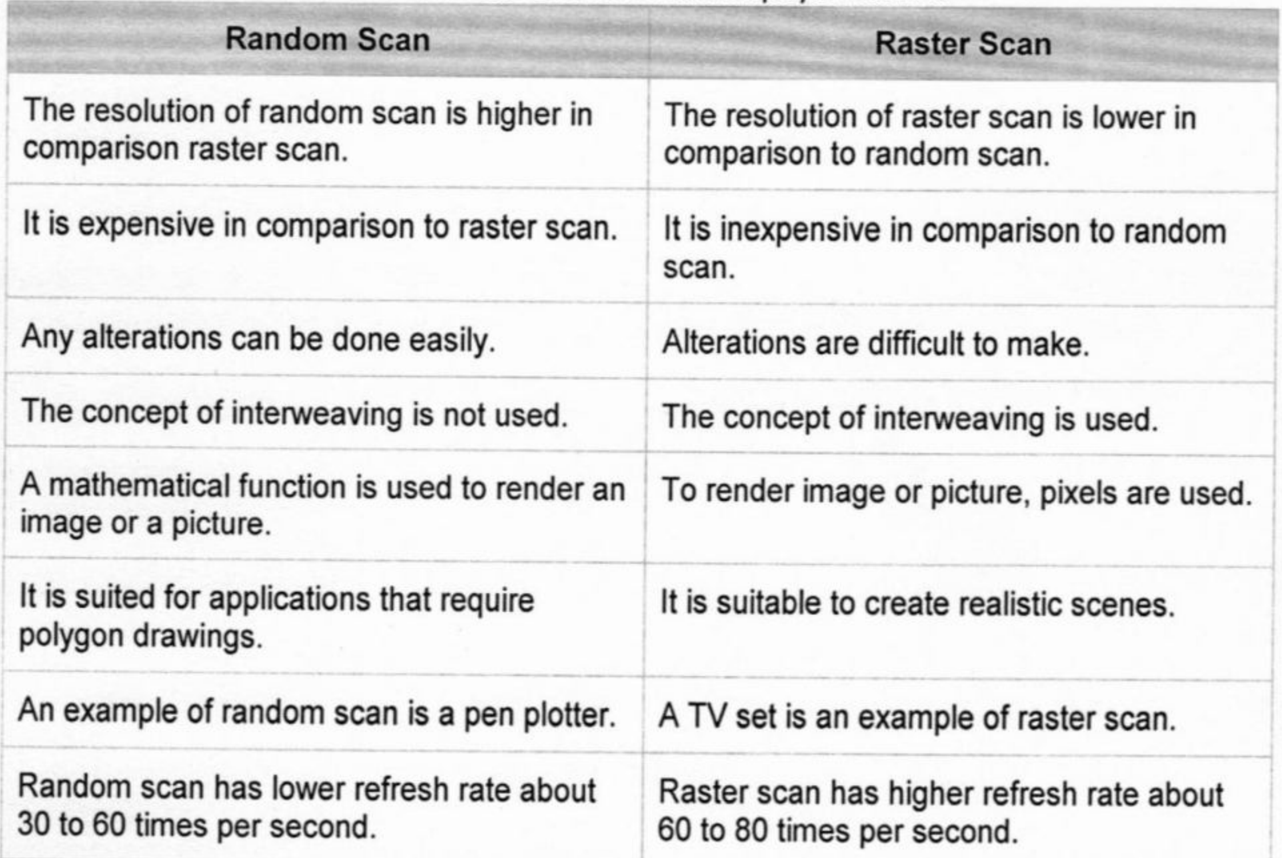
FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB :**CG&V[15CS62]**
SEM :VI

Scheme and Solutions

Year: 18-19 even
MAX MARKS :30
TIME : 75 min

1	a	Write a neat diagram of the color CRT monitors and flat panel displays-2M explanation the color CRT monitors and flat panel displays-5M	7M	CO4
	b	Write the differences between random scan and raster scan displays? X1.6M=8	8M	CO4



Random Scan	Raster Scan
The resolution of random scan is higher in comparison raster scan.	The resolution of raster scan is lower in comparison to random scan.
It is expensive in comparison to raster scan.	It is inexpensive in comparison to random scan.
Any alterations can be done easily.	Alterations are difficult to make.
The concept of interweaving is not used.	The concept of interweaving is used.
A mathematical function is used to render an image or a picture.	To render image or picture, pixels are used.
It is suited for applications that require polygon drawings.	It is suitable to create realistic scenes.
An example of random scan is a pen plotter.	A TV set is an example of raster scan.
Random scan has lower refresh rate about 30 to 60 times per second.	Raster scan has higher refresh rate about 60 to 80 times per second.

OR

2	a	6 applications X1.16M=7M Design. Development is associated with fields such as engineering and architecture. ... User Interfaces. ...Machine Drawing. ... Visualization. ... Education. ... Entertainment. ... Presentation Graphics.	7M	CO4
	b	explanation the Bresenham's line drawing algorithm-3M Derive the expression for decision parameter?-5M	8M	CO4
3	a	For the given endpoints (5,10) and (10,20) Find all the (x,y) points using DDA algorithm ?-7M	7M	CO5
	b	Explanation the Bresenham's midpoint circle drawing algorithm-3M derive the equation for decision parameter ?-5M	8M	CO5
		OR		
4	a	explanation of DDA line drawing algorithm-2M DDA Algorithm-5M	7M	CO5
	b	What are vertex arrays?-2M Write an Open GL program to draw a color cube and spin it using OpenGL transformation matrices? -6M	8M	CO5

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI
EDUCATION

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB :CG&V[15CS62]
SEM :VI

year: 18-19 even
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	Explain of OpenGL fill-area attribute function and Inverse transformations?	7M	CO2
	b	Explain matrix representations and homogeneous coordinates?	8M	CO2
		OR		
2	a	Explain 2D viewing pipeline and OpenGL 2D viewing functions?	7M	CO2
	b	Explain OpenGL raster transformations and OpenGL geometric transformations function?	8M	CO2
3	a	Explain normalization and viewport transformations?	7M	CO3
	b	Explain Properties of light? and color models?	8M	CO3
		OR		
4	a	Explain 3D translation and its types ?	7M	CO3
	b	Explain clipping algorithms and 2D point clipping?	8M	CO3

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

INTERNAL ASSESMENT TEST: II <u>**Scheme and Solutions**</u> **year: 18-19 even**
SUB :**CG&V[15CS62]** **MAX MARKS** :30
SEM :VI **TIME** : 75 min

1	a	Explanation of OpenGL fill-area attribute functions By default, a polygon interior is displayed in a solid color, determined by the current color settings. Alternatively, we can fill a polygon with a pattern and we can display polygon edges as line borders around the interior fill. Polygon vertices are specified counterclockwise -4M and Inverse transformations-3M	7M	CO2
	b	Explanation matrix representations-3M and homogeneous coordinates-5M	8M	CO2
		OR		
2	a	Explanation 2D viewing pipeline--The term Viewing Pipeline describes a series of transformations, which are passed by geometry data to end up as image data being displayed on a device-2M and OpenGL 2D viewing functions GluOrtho2D (xwmin, xwmax, ywmin, ywmax); double-precision numbers. This function specifies an orthogonal projection for mapping the scene to the screen -5M	7M	CO2
	b	Explanation OpenGL raster transformations-3M and OpenGL geometric transformations function-5M	8M	CO2
3	a	Explanation normalization -Normalization is the process of organizing data in a database. This includes creating tables and establishing relationships between those tables according to rules designed both to protect the data and to make the database more flexible by eliminating redundancy and inconsistent dependency -2M and viewport transformations-5M	7M	CO3
	b	5M Explanation Properties of light-5M and color models-3M	8M	CO3
		OR		
4	a	Explanation 3D translation-2M **Translation:** It is the process of changing the relative location of a 3-D object with respect to the original position by changing its coordinates. and its types -5M	7M	CO3
	b	Explanation clipping algorithms-3M and 2D point clipping-	8M	CO3

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: IIII **year: 18-19 even**
SUB :CG&V[15CS62] **MAX MARKS** :30
SEM :VI **TIME** : 75 min

Note: Answer Two full Questions

1	a	Explain Projection transformation and orthogonal projections?	7M	CO4
	b	Explain Transformation from world to viewing coordinates AND back face detection?	8M	CO4
		OR		
2	a	Explain 3D viewing concepts and 3D viewing pipeline?	7M	CO4
	b	Explain The viewport transformation and 3D screen coordinates?	8M	CO4
3	a	Explain Display processor and Modelling?	7M	CO5
	b	Explain Display Lists and Modelling?	8M	CO5
		OR		
4	a	Explain Input devices and clients and servers?	7M	CO5
	b	Explain Building Interactive Models and Animating Interactive programs?	8M	CO5

PRINCIPAL
SIET., TUMAKURU.

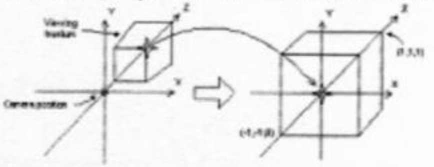
SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III
SUB :**CG&V[15CS62]**
SEM :VI

year: 18-19 even
MAX MARKS :30
TIME : 75 min

Scheme and Solutions

1	a	5MExplanation Input devices-2M and clients and servers?-5M	7M	CO4
	b	Explanation Transformation from world to viewing coordinates-3M AND back face detection?-5M	8M	CO4
		OR		
2	a	Explanation Projection transformation What is projection transformation?  The projection transformation converts the viewing frustum into a cuboid shape. The near end of the viewing frustum is smaller than the far end, which has the effect of expanding objects that are near to the camera. This is how perspective is applied to the scene -2M and orthogonal projections?-5M	7M	CO4
	b	Explanation The viewport transformation-3M and 3D screen coordinates?-5M	8M	CO4
3	a	Explanation display processor The Display Processor (DPRO) is responsible for the display of incident status information obtained from Field Observers (FOBS), aerial and ortho photographs, and infrared data -2M and Modelling-5M	7M	CO5
	b	Explanation Display Lists A display list (or display file) is a series of graphics commands that define an output image. The image is created (rendered) by executing the commands to combine various primitives. -3M and Modelling?-5M	8M	CO5
		OR		
4	a	Explanation 3D viewing concepts Generating a view of an object in three dimensions is similar to photographing the object. We can walk around and take its picture from any angle, at various distances, and with varying camera orientations. Whatever appears in the viewfinder is projected onto the flat film surface -2M and 3D viewing pipeline?-	7M	CO5
	b	Explanation Building Interactive Models-3M and Animating Interactive programs- These four steps form the backbone of the animation process, but mood boarding, style framing, storyboarding, sound design, voiceover recording, and music all form key aspects of the process as well. -5M	8M	CO5

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI
EDUCATION

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB :BIG DATA ANALYTICS[15CS82]
SEM :VIII
TIME : 75 min

year: 18-19 even
MAX MARKS :30

Note: Answer Two full Questions

1	a	Explain with neat diagram Hadoop MapReduce Framework?	7M	CO1
	b	Explain Running Example Programs and Benchmarks of Hadoop Distributed File System?	8M	CO1
OR				
2	a	Explain with neat diagram Hadoop Distributed File System Basics?	7M	CO1
	b	Explain with neat diagram MapReduce Programming?	8M	CO1
3	a	Explain with neat diagram Managing Hadoop with Apache Ambari?	7M	CO1
	b	List and Explain the Hadoop YARN Applications?	8M	CO1
OR				
4	a	List and Briefly explain Essential Hadoop Tools?	7M	CO2
	b	Explain Managing Hadoop with Apache Ambari?	8M	CO2

PRINCIPAL
SIET., TUMAKURU.

18-19 even
BDA

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I **year: 18-19 even**
SUB :BIG DATA ANALYTICS[15CS82] **MAX MARKS** :30
SEM : VIII **TIME** : 75 min

SCHEME AND SOLUTIONS

1	a	Explanation with neat diagram-2M Hadoop MapReduce Framework Hadoop MapReduce is a software framework for easily writing applications which process vast amounts of data (multi-terabyte data-sets) in-parallel on large clusters (thousands of nodes) of commodity hardware in a reliable, fault-tolerant manner -5M	7M	CO1
	b	Explanation Running Example Programs-3M and Benchmarks of Hadoop Distributed File System-5M	8M	CO1
		OR		
2	a	• Explanation with neat diagram-2M Hadoop Distributed File System Basics-***Extremely large files***: Here we are talking about the data in range of petabytes(1000 TB). • ***Streaming Data Access Pattern***: HDFS is designed on principle of *write-once and read-many-times*. Once data is written large portions of dataset can be processed any number times. • ***Commodity hardware:*** Hardware that is inexpensive and easily available in the market. This is one of feature which specially distinguishes HDFS from other file system-**5m**	7M	CO1
	b	Explanation with neat diagram-3M MapReduce Programming-5M	8M	CO1
3	a	5MExplanation with neat diagram-2M Managing Hadoop with Apache Ambari-5M	7M	CO1
	b	List-3M and Explanation the Hadoop YARN Applications- YARN helps to open up Hadoop by allowing to process and run data for batch processing, stream processing, interactive processing and graph processing which are stored in HDFS. In this way, It helps to run different types of distributed applications other than MapReduce. -5M	8M	CO1
		OR		
4	a	List-2M and Briefly explanation Essential Hadoop Tools Apache Spark: A unified analytics engine can perform data processing functions hundred times faster. ... Map Reduce: ...Apache Impala. ... Apache Hive. ...Apache Mahout. ...Pig. ...HBase. ...Apache Sqoop. -	7M	CO2
	b	Explanation Managing Hadoop-3M with Apache Ambari- Ambari provides an intuitive Web UI as well as a robust REST API, which is particularly useful for automating cluster operations. With Ambari, Hadoop operators get the following core benefits: Simplified Installation, Configuration and Management. Easily and efficiently create, manage and monitor clusters at scale. **-5M**	8M	CO2

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB :BIG DATA ANALYTICS[15CS62]
SEM : VIII

year: 18-19 even
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	List and Briefly explain Essential Hadoop Tools?	7M	CO2
	b	Explain Managing Hadoop with Apache Ambari?	8M	CO2
		OR		
2	a	Explain with neat diagram Managing Hadoop with Apache Ambari?	7M	CO2
	b	List and Explain the Hadoop YARN Applications?	8M	CO2
3	a	List and Explain Business Intelligence Concepts?	7M	CO3
	b	Explain Data Mining and Data Visualization?	8M	CO3
		OR		
4	a	Explain Data Warehousing and Data Mining?	7M	CO3
	b	List and Explain Application of Business Intelligence?	8M	CO3

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB :BIG DATA ANALYTICS[15CS62]
SEM : VIII

year: 18-19 even
MAX MARKS :30
TIME : 75 min

SCHEME AND SOLUTIONS

1	a	List-2M and Briefly explanation Essential Hadoop Tools-Apache Spark: A unified analytics engine can perform data processing functions hundred times faster. ... Map Reduce: ...Apache Impala. ... Apache Hive. ...Apache Mahout. ...Pig. ...HBase. ...Apache Sqoop-5M	7M	CO2
	b	Explain Managing Hadoop-3M with Apache Ambari-5M	8M	CO2
		OR		
2	a	Explanation with neat diagram-2M Managing Hadoop with Apache Ambari **Ambari** is a great tool to monitor and **manage** complex distributed systems such as **Hadoop**. It collects information from cluster nodes and offers them to you --5M	7M	CO2
	b	List-3M and Explanation the Hadoop YARN Applications- YARN helps to open up Hadoop by allowing to process and run data for batch processing, stream processing, interactive processing and graph processing which are stored in HDFS. In this way, It helps to run different types of distributed applications other than MapReduce.-5M	8M	CO2
3	a	List-2M and Explain Business Intelligence Concepts BI performs analysis, reporting, data mining, predictive analysis, online analytical processing, and business performance management -- 5M	7M	CO3
	b	Explanation Data Mining-3M and Data Visualization- Data visualization is the representation of data through use of common graphics, such as charts, plots, infographics, and even animations. These visual displays of information communicate complex data relationships and data-driven insights in a way that is easy to understand. -5M	8M	CO3
		OR		
4	a	Explanation Data Warehousing-2M and Data Mining- **Data mining** is the process of sorting through large data sets to identify patterns and relationships that can help solve business problems through data -5M	7M	CO3
	b	List-3M and Explain Application of Business Intelligence- Business intelligence (BI) uses software to convert reams of information into bite-sized insights to inform decision-making. The software receives data from a company's ERP system and other data sets via a sync tool or API. The BI tool then analyzes the data sets and presents findings in reports and dashboards. **-5m**	8M	CO3

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III
SUB :BIG DATA ANALYTICS[15CS62]
SEM : VIII

year: 18-19 even
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	Explain Artificial Neural Networks and Cluster Analysis?	7M	CO4
	b	Explain Regression and Artificial Neural Networks?	8M	CO4
		OR		
2	a	Explain Decision Trees and Regression?	7M	CO4
	b	Explain Cluster Analysis and Association Rule Mining?	8M	CO4
3	a	Explain Support Vector Machines and Web Mining?	7M	CO5
	b	Explain Naïve-Bayes Analysis and Support Vector Machines?	8M	CO5
		OR		
4	a	Explain Text Mining and Naïve-Bayes Analysis?	7M	CO5
	b	Explain Web Mining and Social Network Analysis?	8M	CO5

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI
EDUCATION

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III **year: 18-19 even**
SUB :BIG DATA ANALYTICS[15CS62] **MAX MARKS** :30
SEM : VIII **TIME** : 75 min

SCHEME AND SOLUTIONS

1	a	Explanation Artificial Neural Networks-2M and Cluster Analysis-5M	7M	CO4
	b	Explanation Regression-3M and Artificial Neural Networks- A neural network is a method in artificial intelligence that teaches computers to process data in a way that is inspired by the human brain. It is a type of machine learning process, called deep learning, that uses interconnected nodes or neurons in a layered structure that resembles the human brain -5M	8M	CO4
		OR		
2	a	Explanation Decision Trees A decision tree is a non-parametric supervised learning algorithm, which is utilized for both classification and regression tasks. It has a hierarchical, tree structure, which consists of a root node, branches, internal nodes and leaf nodes. --2M and Regression-5M	7M	CO4
	b	Explanation Cluster Analysis-3M and Association Rule Mining- Association rule mining finds interesting associations and relationships among large sets of data items. This rule shows how frequently a itemset occurs in a transaction. A typical example is a Market Based Analysis. -5M	8M	CO4
3	a	Explanation Support Vector Machines-2M and Web Mining- Web mining can define as the method of utilizing data mining techniques and algorithms to extract useful information directly from the web, such as Web documents and services, hyperlinks, Web content, and server logs. -5M	7M	CO5
	b	Explanation Naïve-Bayes Analysis-3M and Support Vector Machines- **Support Vector Machine** or **SVM** is one of the most popular Supervised Learning algorithms, which is used for Classification as well as Regression problems -5M	8M	CO5
		OR		
4	a	Explanation Text Mining-2M and Naïve-Bayes Analysis-5M	7M	CO5
	b	Explanation Web Mining-3M and Social Network Analysis Social network analysis (SNA) is the process of investigating social structures through the use of networks and graph theory. It characterizes networked structures in terms of nodes (individual actors, people, or things within the network) and the ties, edges, or links (relationships or interactions) that connect them --5M	8M	CO5

PRINCIPAL
SIET., TUMAKURU.

2018-19

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III
SUB: CNS [15CS61]
SEM: VI

year: 18-19 even
MAX MARKS: 30
TIME: 75 min

Scheme and solution

1	a	Definition of web services as defined by ω^3 C-4M Discuss the entities involved in web services.-4M	8M	CO4
	b	List -3M and explain practice issues of Firewall.-4M	7M	CO4
		OR		
2	a	Explanation of DDOS attack prevention -4M and detection-4M	8M	CO4
	b	Depict four-way handshake in 802.11i-7M	7M	CO4
3	a	What is Information Act-4M Discuss its aim, objective and scope of the act-4M	8M	CO5
	b	Explanation of duties of a subscriber.-7M	7M	CO5
		OR		
4	a	List any four functions of controller.-8M	8M	CO5
	b	Definition of penalty for failure to furnish information return under section 43 of IT ACT 2000.-7M	7M	CO5

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB : **CG&V [15CS61]**
SEM : VI

year: 18-19 even
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	Explain AH and ESP in tunnel mode of IP security?	8M	CO3
	b	Explain password based one way authentication.	7M	CO3
		OR		
2	a	Explain identity based encryption?	7M	CO3
	b	Explain SSL handshake protocol.	8M	CO3
3	a	Explain the functions of WS-security.	8M	CO4
	b	Discuss the characteristics of worms.	7M	CO4
		OR		
4	a	Define SOAP. Explain SOAP messages in HTTP packets.	8M	CO4
	b	Explain the functions of Firewall.	7M	CO4

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB: CNS [15CS61]
SEM: VI

year: 18-19 Even
MAX MARKS: 30
TIME: 75 min

Scheme and solution

1	a	Define cyber security -3M Explain the motives of cyber-attack 4M	7M	CO1
	b	Explanation of DES construction in details- 8M	8M	CO1
		OR		
2	a	Explanation of different classes of vulnerabilities in the domain of network security-7M	7M	CO1
	b	Explanation of three sounds SPN network?-8M	8M	CO1
3	a	Explanation of Public Key Cryptography Standards (PKCS)?- 8M	8M	CO2
	b	Explanation of basic properties of hash function?-7M	7M	CO2
		OR		
4	a	List RSA operation – 4M and explain them in details-4M	8M	CO2
	b	Explanation of Birthday attack? -7M	7M	CO2

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III **year: 18-19 even**
SUB: CNS [15CS61] **MAX MARKS**: 30
SEM: VI **TIME**: 75 min

Note: Answer two full Questions

1	a	Define web services as defined by ω^3 C. Discuss the entities involved in web services.	8M	CO4
	b	List and explain practice issues of Firewall.	7M	CO4
		OR		
2	a	Explain DDOS attack prevention and detection.	8M	CO4
	b	Depict four-way handshake in 802.11i.	7M	CO4
3	a	What is Information Act? Discuss its aim, objective and scope of the act.	8M	CO5
	b	Explain the duties of a subscriber.	7M	CO5
		OR		
4	a	List any four functions of controller.	8M	CO5
	b	Define the penalty for failure to furnish information return under section 43 of IT ACT 2000.	7M	CO5

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

INTERNAL ASSESMENT TEST: I
SUB: CNS [15CS61]
SEM: VI

year: 18-19 Even
MAX MARKS: 30
TIME: 75 min

Note: Answer two full Questions

1	a	Define cyber security? Explain the motives of cyber-attack?	7M	CO1
	b	Explain DES construction in details?	8M	CO1
OR				
2	a	Explain the different classes of vulnerabilities in the domain of network security?	7M	CO1
	b	Explain three sounds SPN network?	8M	CO1
3	a	Explain Public Key Cryptography Standards (PKCS)?	8M	CO2
	b	Explain basic properties of hash function?	7M	CO2
OR				
4	a	Explain RSA operation in detail?	8M	CO2
	b	Explain Birthday attack?	7M	CO2

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB: CNS [15CS61]
SEM: VI

year: 18-19 even
MAX MARKS: 30
TIME: 75 min

Scheme and solution

1	a	Explanation of AH and ESP-4M in tunnel mode of IP security-4M	8M	CO3
	b	Explain password-4M based one way authentication-3M	7M	CO3
OR				
2	a	Explanation of identity -3M based encryption -4M	7M	CO3
	b	Explanation of SSL -4M handshake protocol -4M	8M	CO3
3	a	Explanation functions-4M of WS-security.-4M	8M	CO4
	b	Discuss the characteristics of worms-7M	7M	CO4
OR				
4	a	Define SOAP-4M Explain SOAP messages in HTTP packets.-4M	8M	CO4
	b	Explain the functions of Firewall.-7M	7M	CO4

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB: CNS [15CS61]
SEM: VI

year: 18-19 Even
MAX MARKS: 30
TIME: 75 min

Scheme and solution

1	a	Define cyber security -3M Explain the motives of cyber-attack 4M	7M	CO1
	b	Explanation of DES construction in details- 8M	8M	CO1
		OR		
2	a	Explanation of different classes of vulnerabilities in the domain of network security-7M	7M	CO1
	b	Explanation of three sounds SPN network?-8M	8M	CO1
3	a	Explanation of Public Key Cryptography Standards (PKCS)?- 8M	8M	CO2
	b	Explanation of basic properties of hash function?-7M	7M	CO2
		OR		
4	a	List RSA operation – 4M and explain them in details-4M	8M	CO2
	b	Explanation of Birthday attack? -7M	7M	CO2

PRINCIPAL.
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB: CNS [15CS61]
SEM: VI

year: 18-19 Even
MAX MARKS: 30
TIME: 75 min

Note: Answer two full Questions

1	a	Define cyber security? Explain the motives of cyber-attack?	7M	CO1
	b	Explain DES construction in details?	8M	CO1
		OR		
2	a	Explain the different classes of vulnerabilities in the domain of network security?	7M	CO1
	b	Explain three sounds SPN network?	8M	CO1
3	a	Explain Public Key Cryptography Standards (PKCS)?	8M	CO2
	b	Explain basic properties of hash function?	7M	CO2
		OR		
4	a	Explain RSA operation in detail?	8M	CO2
	b	Explain Birthday attack?	7M	CO2

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II **year: 18-19 even**
SUB : CG&V [15CS61] **MAX MARKS** :30
SEM : VI **TIME** : 75 min

Note: Answer Two full Questions

1	a	Explain AH and ESP in tunnel mode of IP security?	8M	CO3
	b	Explain password based one way authentication.	7M	CO3
		OR		
2	a	Explain identity based encryption?	7M	CO3
	b	Explain SSL handshake protocol.	8M	CO3
3	a	Explain the functions of WS-security.	8M	CO4
	b	Discuss the characteristics of worms.	7M	CO4
		OR		
4	a	Define SOAP. Explain SOAP messages in HTTP packets.	8M	CO4
	b	Explain the functions of Firewall.	7M	CO4

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB: CNS [15CS61]
SEM: VI

year: 18-19 even
MAX MARKS: 30
TIME: 75 min

Scheme and solution

1	a	Explanation of AH and ESP-4M in tunnel mode of IP security-4M	8M	CO3
	b	Explain password-4M based one way authentication-3M	7M	CO3
OR				
2	a	Explanation of identity -3M based encryption -4M	7M	CO3
	b	Explanation of SSL -4M handshake protocol -4M	8M	CO3
3	a	Explanation functions-4M of WS-security.-4M	8M	CO4
	b	Discuss the characteristics of worms-7M	7M	CO4
OR				
4	a	Define SOAP-4M Explain SOAP messages in HTTP packets.-4M	8M	CO4
	b	Explain the functions of Firewall.-7M	7M	CO4

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III
SUB: CNS [15CS61]
SEM: VI

year: 18-19 even
MAX MARKS: 30
TIME: 75 min

Scheme and solution

1	a	Definition of web services as defined by ω^3C-4M Discuss the entities involved in web services.-4M	8M	CO4
	b	List -3M and explain practice issues of Firewall.-4M	7M	CO4
		OR		
2	a	Explanation of DDOS attack prevention -4M and detection-4M	8M	CO4
	b	Depict four-way handshake in 802.11i-7M	7M	CO4
3	a	What is Information Act-4M Discuss its aim, objective and scope of the act-4M	8M	CO5
	b	Explanation of duties of a subscriber.-7M	7M	CO5
		OR		
4	a	List any four functions of controller.-8M	8M	CO5
	b	Definition of penalty for failure to furnish information return under section 43 of IT ACT 2000.-7M	7M	CO5

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III **year: 18-19 even**
SUB: CNS [15CS61] **MAX MARKS**: 30
SEM: VI **TIME**: 75 min

Note: Answer two full Questions

1	a	Define web services as defined by ω^3 C. Discuss the entities involved in web services.	8M	CO4
	b	List and explain practice issues of Firewall.	7M	CO4
		OR		
2	a	Explain DDOS attack prevention and detection.	8M	CO4
	b	Depict four-way handshake in 802.11i.	7M	CO4
3	a	What is Information Act? Discuss its aim, objective and scope of the act.	8M	CO5
	b	Explain the duties of a subscriber.	7M	CO5
		OR		
4	a	List any four functions of controller.	8M	CO5
	b	Define the penalty for failure to furnish information return under section 43 of IT ACT 2000.	7M	CO5

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB : **DBMS [15CS53]**
SEM : V

year: 18-19 ODD
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	Explain Unary and Binary relational operations, additional relational operations (aggregate, grouping, etc.) Examples of Queries in relational algebra.?	7M	CO2
	b	Explain Relational Database Design using ER-to-Relational mapping	8M	CO2
		OR		
2	a	Explain Relational Database Design using ER-to-Relational mapping.	7M	CO2
	b	Explain matrix representations and homogeneous coordinates?	8M	CO2
3	a	Explain More complex SQL retrieval queries, Specifying constraints as assertions and action triggers, Views in SQL, , Schema change statements in SQL?	7M	CO3
	b	Explain introduction to JDBC, JDBC classes and interfaces, SQLJ, Stored procedures,	8M	CO3
		OR		
4	a	Explain Case study: The internet Bookshop.	7M	CO3
	b	Explain The three-Tier application architecture, The presentation layer, The Middle Tier	8M	CO3

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB : **DBMS [15CS53]**
SEM : V

year: 18-19 ODD
MAX MARKS :30
TIME : 75 min

Scheme and solution

1	a	Explain Unary and Binary relational operations-2M, additional relational operations aggregate, grouping, etc.) Examples of Queries in relational algebra.-5M?	7M	CO2
	b	Explain Relational Database Design-3M using ER-to-Relational mapping-5M	8M	CO2
		OR		
2	a	Explain More complex SQL retrieval queries-2M, Specifying constraints as assertions-5M?	7M	CO2
	b	Explain matrix representations-3M and homogeneous coordinates-5M?	8M	CO2
3	a	Explain action triggers-3M, Views in SQL , Schema change statements in SQL-4M?	7M	CO3
	b	Explain introduction to JDBC-3M, JDBC classes and interfaces, SQLJ, Stored procedures-5M?,	8M	CO3
		OR		
4	a	Explain Case study: The internet Bookshop. -7M	7M	CO3
	b	Explain The three-Tier application architecture-3M, The presentation layer, The Middle Tier-5M?	8M	CO3

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III
SUB : **DBMS [15CS53]**
SEM : V

year: 18-19 ODD
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	Explain Introduction to Normalization using Functional and Multivalued Dependencies?	7M	CO4
	b	Briefly Explain Informal design guidelines for relation schema, Functional Dependencies, Normal Forms based on Primary Keys, Second and Third Normal Forms?	8M	CO4
		OR		
2	a	Briefly explain Boyce-Codd Normal Form, Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal Form.?	7M	CO4
	b	Explain Algorithms for Relational Database Schema Design, Nulls, Dangling tuples,?	8M	CO4
3	a	Explain Desirable properties of Transactions,?	7M	CO5
	b	Explain Two-phase locking techniques for Concurrency control,?	8M	CO5
		OR		
4	a	Explain Introduction to Transaction Processing and Transaction?	7M	CO5
	b	Explain Recovery Concepts, NO-UNDO/REDO recovery based on Deferred update,?	8M	CO5

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III
SUB : **DBMS [15CS53]**
SEM : V

year: 18-19 ODD
MAX MARKS :30
TIME : 75 min

Scheme and solution

1	a	Explain Introduction to Normalization using Functional-2M and Multivalued Dependencies-5M?	7M	CO4
	b	Briefly Explain Informal design guidelines for relation schema, Functional Dependencies-3M, Normal Forms based on Primary Keys, Second and Third Normal Forms-5M?	8M	CO4
		OR		
2	a	Briefly explain Boyce-Codd Normal Form, Multivalued Dependency-2M and Fourth Normal Form, Join Dependencies and Fifth Normal Form.-5M?	7M	CO4
	b	Explain Algorithms for Relational Database Schema Design-3M, Nulls, Dangling tuples-5M,?	8M	CO4
3	a	Explain Desirable properties of Transactions,-7M?	7M	CO5
	b	Explain Two-phase locking techniques for Concurrency control,?-8M	8M	CO5
		OR		
4	a	Explain Introduction to Transaction Processing-5M and Transaction-2M?	7M	CO5
	b	Explain Recovery Concepts, NO-UNDO/REDO recovery based on Deferred update,?-8M	8M	CO5

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB : **DBMS[15CS53]**
SEM : V

year: 18-19 ODD
MAX MARKS :30
TIME : 75 min

Scheme and solutions

1	a	Listing and explanation-2M Characteristics of database approach-5M	7M	CO1
	b	Advantages of using the DBMS approach-3M And History of database applications-5M	8M	CO1
		OR		
2	a	Explain Data Models-2M, Schemas, and Instances-5M?	7M	CO1
	b	Briefly explain Three schema architecture and data independence-2M, database languages, and interfaces, The Database System environment-5M?.	8M	CO1
3	a	Explain Entity types, Entity sets-3M, attributes, roles-5M?	7M	CO1
	b	Explain structural constraints, Weak entity types, ER diagrams-3M, examples, Specialization and Generalization-5M?	8M	CO1
		OR		
4	a	Explain Relational Model Concepts-2M, Relational Model Constraints-5M?	7M	CO2
	b	Explain relational database schemas-3M, Update operations, transactions, and dealing with constraint violations-5M?	8M	CO2

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB : **DBMS[15CS53]**
SEM : V

year: 18-19 ODD
MAX MARKS :30
TIME : 75 min

NOTE:Answer Any Two Quertions

1	a	List and explain Characteristics of database approach.	7M	CO1
	b	Explain Advantages of using the DBMS approach And History of database applications?	8M	CO1
		OR		
2	a	Explain Data Models, Schemas, and Instances?	7M	CO1
	b	Briefly explain Three schema architecture and data independence, database languages, and interfaces, The Database System environment?.	8M	CO1
3	a	Explain Entity types, Entity sets, attributes, roles?	7M	CO1
	b	Explain structural constraints, Weak entity types, ER diagrams, examples, Specialization and Generalization?	8M	CO1
		OR		
4	a	Explain Relational Model Concepts, Relational Model Constraints?	7M	CO2
	b	Explain relational database schemas, Update operations, transactions, and dealing with constraint violation?	8M	CO2

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB : **ADE [17CS32]**
SEM : III

year: 18-19
MAX MARKS :30
TIME : 75 min

SCHEME AND SOLUTION

1	a	What is Junction-2M Field Effect Transistors-3M MOSFETs-3M	8M	CO1
	b	What is the Differences between JFETs-2M and MOSFETs-3M Biasing MOSFETs-2M	7M	CO1
		OR		
2	a	Explain FET Applications-4M, CMOS Devices-4M	8M	CO1
	b	Explain Wave-Shaping Circuits: Integrated Circuit(IC)-3M Multivibrators-4M	7M	CO1
3	a	Briefly Explain Peak Detector Circuit-4M Comparator, Active Filters-4M.	8M	CO1
	b	List and explain Non-Linear Amplifier-3M, Relaxation Oscillator-2M, Current-To Voltage Converter-2M	7M	CO1
		OR		
4	a	Give the Overview of Multiplexers-4M, Demultiplexers-4M	8M	CO2
	b	Explain The Magnitude Comparator-4M Programmable Array Logic-3M	7M	CO2

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB : **ADE [17CS32]**
SEM : III

year: 18-19
MAX MARKS :30
TIME : 75 min

Note: Answer Any Two full Que

1	a	Write a Review of Basic Logic gates, Positive and Negative Logic?	8M	CO2
	b	What is Sum-of-Products Method, Truth Table to Karnaugh Map?	7M	CO2
		OR		
2	a	Explain Pairs Quads, and Octets.	8M	CO2
	b	Explain Karnaugh Simplifications, Don't-care Conditions?	7M	CO2
3	a	Briefly Explain Multiplexers, Demultiplexers, 1-of-16 Decoder.	8M	CO3
	b	List and explain BCD to Decimal Decoders, Seven Segment Decoders, Encoders.	7M	CO3
		OR		
4	a	Give the Overview of Multiplexers, Demultiplexers.	8M	CO3
	b	Explain The Programmable Array Logic, Programmable Logic Arrays?	7M	CO3

PPINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III
SUB : **ADE [17CS32]**
SEM : III

year: 18-19
MAX MARKS :30
TIME : 75 min

Note: Answer Any Two full Que

1	a	Write a FLIP-FLOP Timing, JK Master-slave FLIP-FLOP?	8M	CO4
	b	What is Switch Contact Bounce Circuits, Various Representation of FLIP-FLOPs?	7M	CO4
		OR		
2	a	Explain HDL Implementation of FLIP-FLOP.	8M	CO4
	b	Explain Types of Registers, Serial In - Serial Out?	7M	CO4
3	a	Briefly Explain Decade Counters, Presettable Counters.	8M	CO5
	b	List and explain Counter Design as a Synthesis problem.	7M	CO5
		OR		
4	a	Give the D/A Converters, D/A Accuracy and Resolution.	8M	CO5
	b	Explain Continuous A/D Conversion, A/D Techniques?	7M	CO5

PRINCIPAL
SIET. TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

FS 543667

INTERNAL ASSESMENT TEST: II
SUB : **ADE [17CS32]**
SEM : III

year: 18-19
MAX MARKS :30
TIME : 75 min

Scheme and solution

1	a	Write a Review of Basic Logic gates-4M, Positive and Negative Logic-4M	8M	CO2
	b	What is Sum-of-Products Method-4M, Truth Table to Karnaugh Map-3M	7M	CO2
		OR		
2	a	Explain Pairs Quads-4M, and Octets-4M	8M	CO2
	b	Explain Karnaugh Simplifications-3M, Don't-care Conditions-4M	7M	CO2
3	a	Briefly Explain Multiplexers-4M Demultiplexers, 1-of-16 Decoder-4M	8M	CO3
	b	List and explain BCD to Decimal Decoders,-4MSeven Segment Decoders, Encoders-3M	7M	CO3
		OR		
4	a	Give the Overview of Multiplexers-4M Demultiplexers-4M.	8M	CO3
	b	Explain The Programmable Array Logic-4M, Programmable Logic Arrays-3M	7M	CO3

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB : **ADE [17CS32]**
SEM : III

year: 18-19
MAX MARKS :30
TIME : 75 min

Note: Answer Any Two full Que

1	a	What is Junction Field Effect Transistors, MOSFETs?	8M	CO1
	b	What is the Differences between JFETs and MOSFETs, Biasing MOSFETs?	7M	CO1
		OR		
2	a	Explain FET Applications, CMOS Devices.	8M	CO1
	b	Explain Wave-Shaping Circuits: Integrated Circuit(IC) Multivibrators?	7M	CO1
3	a	Briefly Explain Peak Detector Circuit, Comparator, Active Filters.	8M	CO1
	b	List and explain Non-Linear Amplifier, Relaxation Oscillator, Current-To Voltage Converter.	7M	CO1
		OR		
4	a	Give the Overview of Multiplexers, Demultiplexers.	8M	CO2
	b	Explain The Magnitude Comparator, Programmable Array Logic?	7M	CO2

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III
SUB : **ADE [17CS32]**
SEM : III

year: 18-19
MAX MARKS :30
TIME : 75 min

Scheme and solution

1	a	Write a FLIP-FLOP Timing-4M JK Master-slave FLIP-FLOP-4M	8M	CO4
	b	What is Switch Contact Bounce Circuits-3M Various Representation of FLIP-FLOPs-4M	7M	CO4
		OR		
2	a	Explain HDL-4M Implementation of FLIP-FLOP-4M	8M	CO4
	b	Explain Types of Registers-3M Serial In - Serial Out-4M	7M	CO4
3	a	Briefly Explain Decade Counters-4M Presettable Counters-4M	8M	CO5
	b	List and explain Counter Design -3M as a Synthesis problem-4M	7M	CO5
		OR		
4	a	Give the D/A Converters-4M D/A Accuracy and Resolution-4M	8M	CO5
	b	Explain Continuous A/D Conversion-3M A/D Techniques-4M	7M	CO5

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I | **year: 18-19 ODD**
SUB : **DMS[17CS36]** | **MAX MARKS** :30
SEM :III | **TIME** : 75 min

Schema and Solutions

1	a	Explaination Basic Connectives and Truth Tables-4M tables-3M	7M	CO1
	b	Explaination The Laws of Logic, Logical Implication –4M and Rules of Inference-4M	8M	CO1
		OR		
2	a	Explaination Data Models-2M Schemas-2M and Instances-3M	7M	CO1
	b	Explaination Basic Connectives-4M and Truth Tables-4M	8M	CO1
3	a	Explaination The Laws of Logic, Logical Implication – 3M and Rules of Inference4M	7M	CO1
	b	Explaination Data Models, Schemas-4M and Instances-3M	8M	CO1
		OR		
4	a	Statement and Explaination Mathematical Induction-4M and Recursive Definitions-3M	7M	CO2
	b	Explaination Fundamental Principles of Counting-8M	8M	CO2

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB : **DMS[17CS36]**
SEM :III

year: 18-19 ODD
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	Explain Basic Connectives and Truth Tables.	7M	CO1
	b	Explain The Laws of Logic, Logical Implication – Rules of Inference.	8M	CO1
		OR		
2	a	Explain Data Models, Schemas, and Instances?	7M	CO1
	b	Explain Basic Connectives and Truth Tables.	8M	CO1
3	a	Explain The Laws of Logic, Logical Implication – Rules of Inference.	7M	CO1
	b	Explain Data Models, Schemas, and Instances?	8M	CO1
		OR		
4	a	State and Explain Mathematical Induction, Recursive Definitions?	7M	CO2
	b	Explain Fundamental Principles of Counting?	8M	CO2

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB : DMS [17CS36]
SEM : III

year: 18-19 ODD
MAX MARKS :30
TIME : 75 min

Schema and Solutions

1	a	Explain Mathematical Induction-3M and The Well Ordering Principle-4M	7M	CO2
	b	Explain Fundamental Principles-4M of Counting-4M	8M	CO2
		OR		
2	a	Explain The Rules of Sum and Product-3M, Permutations, Combinations-4M.	7M	CO2
	b	Explain The Binomial Theorem-4M and Combinations with Repetition-3M?	8M	CO2
3	a	Explain Cartesian Products-3M and Relations and Functions-4M	7M	CO3
	b	Explain The Pigeon-hole Principle-4M, Function Composition and Inverse Functions-4M	8M	CO3
		OR		
4	a	Explain Zero-One Matrices and Directed Graphs-4M, Partial Orders-3M.	7M	CO3
	b	Explain Hasse Diagrams, Equivalence Relations and Partitions.-2MX4	8M	CO3

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB : **DMS [17CS36]**
SEM : **III**

year: 18-19 ODD
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	Explain Mathematical Induction and The Well Ordering Principle	7M	CO2
	b	Explain Fundamental Principles of Counting	8M	CO2
		OR		
2	a	Explain The Rules of Sum and Product, Permutations and Combinations.	7M	CO2
	b	Explain The Binomial Theorem and Combinations with Repetition?	8M	CO2
3	a	Explain Cartesian Products and Relations and Functions	7M	CO3
	b	Explain The Pigeon-hole Principle, Function Composition and Inverse Functions	8M	CO3
		OR		
4	a	Explain Zero-One Matrices and Directed Graphs, Partial Orders.	7M	CO3
	b	Explain Hasse Diagrams, Equivalence Relations and Partitions-.	8M	CO3

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution
FS 543667

INTERNAL ASSESMENT TEST: III
SUB : **DMS [17CS36]**
SEM : III

year: 18-19 ODD
MAX MARKS :30
TIME : 75 min

Note: Answer Two full Questions

1	a	Explain The Principle of Inclusion and Exclusion.	7M	CO4
	b	Explain Generalizations of the Principle.	8M	CO4
		OR		
2	a	Explain Derangements – Nothing is in its Right Place and Rook Polynomials.	7M	CO4
	b	Explain First Order Linear Recurrence Relation and The Second Order Linear Homogeneous Recurrence Relation with Constant Coefficients?	8M	CO4
3	a	Explain Sub graphs and Complements.	7M	CO5
	b	Explain Graph Isomorphism, Vertex Degree, Euler Trails and Circuits	8M	CO5
		OR		
4	a	Explain Introduction to Transaction Processing and Transaction?	7M	CO5
	b	Explain Properties of Routed Trees and Weighted Trees.	8M	CO5

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III
SUB : **DMS [17CS36]**
SEM : III

year: 18-19 ODD
MAX MARKS :30
TIME : 75 min

Schema and Solutions

1	a	Explaination The Principle of Inclusion and Exclusion-4M fig-3M	7M	CO4
	b	Explaination Generalizations of the Principle-4M fig-4M	8M	CO4
		OR		
2	a	Explaination Derangements – Nothing is in its Right Place-3M and Rook Polynomials-4M	7M	CO4
	b	Explaination First Order Linear Recurrence Relation-4M and The Second Order Linear Homogeneous Recurrence Relation with Constant Coefficients-4M	8M	CO4
3	a	Explaination Sub graphs and Complements-7M	7M	CO5
	b	Explaination Graph Isomorphism-2M and Vertex Degree-2M and Euler Trails and Circuits-4M	8M	CO5
		OR		
4	a	Explaination Introduction to Transaction Processing-3M and Transaction-4M	7M	CO5
	b	Explaination Properties of Routed Trees-4M and Weighted Trees-4M	8M	CO5

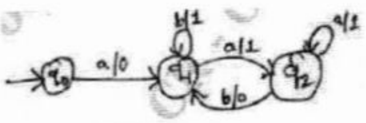
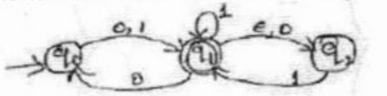
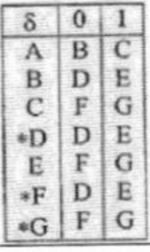
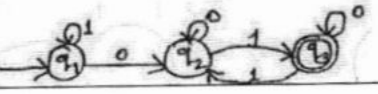
PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB : ATC[15CS54]
SEM : V

year: 18-19 ODD
MAX MARKS :30
TIME :75 min

<table>
<tr><td>1</td><td>a</td><td>List the applications of Finite Automata. Design DFSM for the following languages
i) L={W∈{a,b}*; w has all strings that ends with sub string abb}.</td><td>7M</td><td>CO1</td></tr>
<tr><td></td><td>b</td><td>Draw a DFA to accept strings of a's and b's such that:
i) Languages has even number of a's and odd number of b's.
ii) Languages has not more than three a's.</td><td>8M</td><td>CO1</td></tr>
<tr><td colspan="5"><b>OR</b></td></tr>
<tr><td>2</td><td>a</td><td>Define the following with example:(i) Alphabet (ii) String (iii)Language (iv) Symbol</td><td>7M</td><td>CO1</td></tr>
<tr><td></td><td>b</td><td>Define Finite State Transducers. Obtain an equivalent Moore machine for the Mealy machine given below.

 </td><td>8M</td><td>CO1</td></tr>
<tr><td>3</td><td>a</td><td>Define eps(). Obtain an equivalent DFSM for Finite Automata given below.

 </td><td>7M</td><td>CO1</td></tr>
<tr><td></td><td>b</td><td>Define Power of an Alphabet. Consider the DFSM given below with accepting states (D,F,G) and compute.

<table>
<tr><th>δ</th><th>0</th><th>1</th></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>B</td><td>D</td><td>E</td></tr>
<tr><td>C</td><td>F</td><td>G</td></tr>
<tr><td>*D</td><td>D</td><td>E</td></tr>
<tr><td>E</td><td>F</td><td>G</td></tr>
<tr><td>*F</td><td>D</td><td>E</td></tr>
<tr><td>*G</td><td>F</td><td>G</td></tr>
</table></td><td>8M</td><td>CO1</td></tr>
<tr><td colspan="5"><b>OR</b></td></tr>
<tr><td>4</td><td>a</td><td>Define Regular Expression. Construct the Regular expression for the languages given below
i) L={$a^n b^m$ | n, m ≥ 1, mn≥ 3} ii) L= {$a^n b^m$ | m+n is even}</td><td>7M</td><td>CO2</td></tr>
<tr><td></td><td>b</td><td>Obtain Regular expression for Finite State Machine given below and give the language defined by Regular expression.

 </td><td>8M</td><td>CO2</td></tr>
</table>

PRINCIPAL
SIET., TUMAKURU

SHRIDEVI
EDUCATION

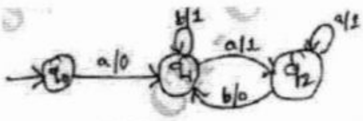
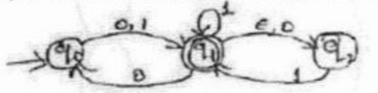
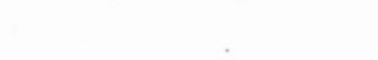
SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: I
SUB : ATC[15CS54]
SEM : V

year: 18-19 ODD
MAX MARKS :30
TIME :75 min

SCHEME AND SOLUTIONS

<table>
<tr><td>1</td><td>a</td><td>List the applications of Finite Automata.-3M Design DFSM for the following languages
i) L={W∈{a,b}*; w has all strings that ends with sub string abb} . -4M</td><td>7M</td><td>CO1</td></tr>
<tr><td></td><td>b</td><td>Draw a DFA to accept strings of a's and b's such that:
i) Languages has even number of a's and odd number of b's. -4M
ii) Languages has not more than three a's. -4M</td><td>8M</td><td>CO1</td></tr>
<tr><td colspan="5"><b>OR</b></td></tr>
<tr><td>2</td><td>a</td><td>Define the following with example:(i) Alphabet -2M (ii) String -2M (iii)Language -2M(iv) Symbol -1M</td><td>7M</td><td>CO1</td></tr>
<tr><td></td><td>b</td><td>Define Finite State Transducers. -2M Obtain an equivalent Moore machine for the Mealy machine given below. -6M

 </td><td>8M</td><td>CO1</td></tr>
<tr><td>3</td><td>a</td><td>Define eps(). -1M Obtain an equivalent DFSM for Finite Automata given below. -6M

 </td><td>7M</td><td>CO1</td></tr>
<tr><td></td><td>b</td><td>Define Power of an Alphabet. 2M Consider the DFSM given below with accepting states (D,F,G) and compute. -6M
<table>
<tr><th>δ</th><th>0</th><th>1</th></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>B</td><td>D</td><td>E</td></tr>
<tr><td>C</td><td>F</td><td>G</td></tr>
<tr><td>*D</td><td>D</td><td>E</td></tr>
<tr><td>E</td><td>F</td><td>G</td></tr>
<tr><td>*F</td><td>D</td><td>E</td></tr>
<tr><td>*G</td><td>F</td><td>G</td></tr>
</table></td><td>8M</td><td>CO1</td></tr>
<tr><td colspan="5"><b>OR</b></td></tr>
<tr><td>4</td><td>a</td><td>Define Regular Expression.-2M Construct the Regular expression for the languages given below
i) L={a^nb^m|n, m $\geq$ 1, mn$\geq$ 3} ii) L= {a^nb^m | m+n is even} -5M</td><td>7M</td><td>CO2</td></tr>
<tr><td></td><td>b</td><td>Obtain Regular expression for Finite State Machine given below and give the language defined by Regular expression.

 </td><td>8M</td><td>CO2</td></tr>
</table>

PRINCIPAL
SIET., TUMAKURU

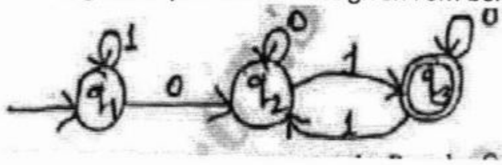
SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB : ATC[15CS54]
SEM : V

year: 18-19 ODD
MAX MARKS :30
TIME :75 min

SCHEME AND SOLUTIONS

1	a	List the closure properties of Regular Languages construct the Regular grammar for the following : I) $L = \{(01)^* 101 (0+1)^* \}$ ii) $L=\{a^{n+1}b^{2m+1} \mid n, m \geq 0\}$ 2x3.5M	7M	CO2
	b	State and prove pumping Lemma for Regular Languages . -4M Prove that, the language $L = \{a^n b^m c^n \mid n, m \geq 0\}$ is not regular. -4M	8M	CO2
		OR		
2	a	Obtain a FSM from the following grammars. $S \rightarrow aT$ $T \rightarrow bT$ $T \rightarrow aW$ $W \rightarrow \varepsilon$ $W \rightarrow aT$	7M	CO2
	b	Build a regular expression for the given FSM below . 	8M	CO2
3	a	Define context free grammar. -2M Write a context free grammar for the languages $L = \{a^{n+2} b^m \mid \underline{n} > 0 \text{ and } m > n\}$ -5M	7M	CO3
	b	Define ambiguity of a grammar. -3M Check whether the following grammar is ambiguous or not. $S \rightarrow aS \mid X$ $X \rightarrow aX \mid a$ -5M	8M	CO3
		OR		
4	a	Simplify the following grammar: $S \rightarrow aA \mid a \mid Bb \mid cC$ $A \rightarrow aB$ $B \rightarrow a \mid Aa$ $C \rightarrow cCD$ $D \rightarrow ddd$	7M	CO3
	b	Define CNF. Construct CFG for the language given below : i) $L = \{W \mid n_a(W) = n_b(W)\}$ ii) $L = \{a^{2n+1} b^m c^m c^{2n} \mid n,m \geq 0\}$. -2x4M	8M	CO3

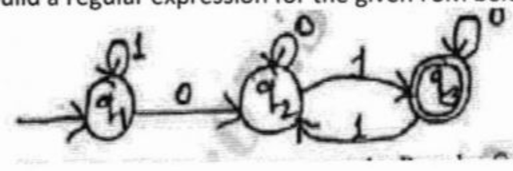
PRINCIPAL
SIET., TUMAKURU

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: II
SUB : ATC[15CS54]
SEM : V

year: 18-19 ODD
MAX MARKS :30
TIME :75 min

1	a	List the closure properties of Regular Languages construct the Regular grammar for the following : I) L = {(01)* 101 (0+1)* } ii) $L=\{a^{n+1}b^{2m+1} \mid n, m \geq 0\}$	7M	CO2
	b	State and prove pumping Lemma for Regular Languages . Prove that, the language $L = \{a^nb^mc^n \mid n, m \geq 0\}$ is not regular.	8M	CO2
		OR		
2	a	Obtain a FSM from the following grammars. S→ aT T→ bT T→ aW W→ε W→ aT	7M	CO2
	b	Build a regular expression for the given FSM below .  S	8M	CO2
3	a	Define context free grammar. Write a context free grammar for the languages $L = \{a^{n+2} b^m \mid \underline{n} > 0 \text{ and } m > n\}$	7M	CO3
	b	Define ambiguity of a grammar. Check whether the following grammar is ambiguous or not. S→ aS|X X→ aX|a	8M	CO3
		OR		
4	a	Simplify the following grammar: S→ aA|a|Bb|cC A→ aB B→ a|Aa C→ cCD D→ ddd	7M	CO3
	b	Define CNF. Construct CFG for the language given below : i) $L = \{W \mid n_a(W) = n_b(W)\}$ ii) $L = \{a^{2n+1} b^m c^m c^{2n} \mid n,m \geq 0\}$.	8M	CO3

PRINCIPAL
SIE[illegible] TUMAKURU.

SHRIDEVI
EDUCATION

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III
SUB : ATC[15CS54]
SEM : V

year: 18-19 ODD
MAX MARKS :30
TIME :75 min

SCHEME AND SOLUTIONS

1	a	List the Closure properties of CFLs.-2M Prove that language L = $\{a^{2n} b^n c^{2n} \mid n \geq 0\}$ is not context free language. -5M	7M	CO4
	b	Define TM . 2M Explain working of TM with a neat diagram. -6M	8M	CO4
		OR		
2	a	Design and constrtuct TM to accept the language L = {W |W is balance parenthesis}. -5M Show the moves made by TM string W = (( ) ( )). -2M	7M	CO4
	b	What is a Turing machine ?-3M Explain different ways of representing Turing machine. -5M	8M	CO4
3	a	What are the various techniques for TM constructions?.	7M	CO5
	b	Derive the following : (I) Recursively enumerable language -4M (ii) Decidable language. -4M	8M	CO5
		OR		
4	a	Explain Church Turing Hypothesis.	7M	CO5
	b	Write a short note on : (i) Quantum computer -4M (ii) Classes of P and NP -4M	8M	CO5

PRINCIPAL
SIET., TUMAKURU.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FS 543667
An ISO 9001:2015 Certified Institution

INTERNAL ASSESMENT TEST: III
SUB : **ATC[15CS54]**
SEM : V

year: 18-19 ODD
MAX MARKS :40
TIME :75 min

1	a	List the Closure properties of CFLs and prove that language L = $\{a^{2n} b^n c^{2n} \mid n \geq 0\}$ is not context free language.	7M	CO4
	b	Define TM . Explain working of TM with a neat diagram.	8M	CO4
		OR		
2	a	Design and constrtuct TM to accept the language L = {W |W is balance parenthesis}. Show the moves made by TM string W = (( ) ( )).	7M	CO4
	b	What is a Turing machine ? Explain different ways of representing Turing machine.	8M	CO4
3	a	What are the various techniques for TM constructions?.	7M	CO5
	b	Derive the following : (I) Recursively enumerable language (ii) Decidable language.	8M	CO5
		OR		
4	a	Explain Church Turing Hypothesis.	7M	CO5
	b	Write a short note on : (i) Quantum computer (ii) Classes of P and NP	8M	CO5

PRINCIPAL
SIET., TUMAKURU.

2018-19

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
INTERNAL ASSESMENT TEST: I

SUB : Cloud Computing-15CS565
SEM : V Sem
MAX MARKS : 30
DATE&TIME : 24/09/18,75 min

NOTE : Answer any **TWO** full questions.

1.a) With a neat diagram explain Cloud-Computing reference model. **5M**
b) Define Cloud Computing? Explain the characteristics and benefits of Cloud Computing. **5M**
c) List and explain any 3 Cloud Computing platforms and technologies. **5M**

OR

2. a) List and explain pros and cons of virtualization. **8M**
b) With a neat diagram explain the machine reference model of execution virtualization. **7M**

3. a) Explain hypervisor reference architecture with a neat diagram. **5M**
b) With a neat diagram explain briefly managed execution. **5M**
c) Explain the following.
a) Security trust and privacy.
b) Cloud definition. **5M**

OR

4 .a) With a neat diagram, briefly explain IAAS reference implementation. **8M**
b) With a neat diagram explain community cloud and List out the benefits. **7M**

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
INTERNAL ASSESMENT TEST: I

SUB : Cloud Computing-15CS565
SEM : V Sem
MAX MARKS : 30
DATE&TIME : 24/09/18,75 min

NOTE : Answer any **TWO** full questions.

1.a) With a neat diagram explain Cloud-Computing reference model. **5M**
b) Define Cloud Computing? Explain the characteristics and benefits of Cloud Computing. **5M**
c) List and explain any 3 Cloud Computing platforms and technologies. **5M**

OR

2. a) List and explain pros and cons of virtualization. **8M**
b) With a neat diagram explain the machine reference model of execution virtualization. **7M**

3. a) Explain hypervisor reference architecture with a neat diagram. **5M**
b) With a neat diagram explain briefly managed execution. **5M**
c) Explain the following.
a) Security trust and privacy.
b) Cloud definition. **5M**

OR

4 .a) With a neat diagram, briefly explain IAAS reference implementation. **8M**
b) With a neat diagram explain community cloud and List out the benefits. **7M**

PRINCIPAL
SIET., TUMAKURU.

Cloud computing - 15CS565

First Internal Scheme of Evaluation

① a) Diagram cloud - reference model → 2M
Explanation of Paas, Iaas, Saas, Web2.0 → 3M } 5M

b) Defination of cloud computing → 1M
characteristics & Benefits → 4M } 5M
a) no upfront commitment b) on demand access c) nice pricing
d) Scalability e) Efficient resource allocation f) energy Efficiency
g) seamless creation & use of third Party services.

c) Listing C.C. Platforms & tech. → 1M
① Amazon web services (AWS) ④ Hadoop
② Google APP Engine ⑤ Force.com & Salesforce.com
③ Microsoft Azure ⑥ Manjrasoft Aneka } 5M
Expln of any above 3 → 4M

(or)

② ⓐ Pros & cons of virtualization → 4M
↓
① Managed Execution & isolation
② Allocation of resources & Efficient use
③ Portability
cons: ① Performance Degradation
② Inefficiency & Degraded user Experience → 4M } 8M
③ security holes & new threats

ⓑ · Diagram M/c ref. Model → 2M
Expln of API, ABI, ISA → 3M
ring security with Diagram → 2M } 7M

PRINCIPAL
SIET., TUMAKURU.

3. ⓐ Hypervisor reference architecture Diagram → 2M
Expl^n of Dispatcher, Interpreter routines, Allocator → 3M } 5M

ⓑ Managed exec. Diagram → 1M
Sharing, Aggregation, Emulation, Isolation → 4M } 5M

ⓒ Explanation regd.
a) security, trust & privacy w.r.t cloud → 3M
b) cloud definitions → 2M } 5M

(or)

4) a) Diagram to illustrate IaaS reference Model → 2M
Explanation of Each component
① Physical Infrastructure → 1M
② Infrastructure mngt. s/w → 4M
③ web based Mngt. Interface → 1M
} 8M

b) Diagram to illustrate community cloud → 2M
Explanation → 2M
Benefits of C.C. → 3M
} ~~8~~7M

① openness ② community ④ convenience & control
③ Graceful failures
⑤ Env. Sustainability.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
INTERNAL ASSESMENT TEST: II

FS 543667
An ISO 9001:2015 Certified Institution

SUB : Cloud Computing-15CS565 **MAX MARKS** : 30
SEM : V Sem **DATE&TIME** : 31/10/18,75 min

NOTE : Answer any **TWO** full questions.

1.a) With a neat diagram explain aneka framework overview **5M**
b) Explain with a neat diagram hybrid cloud deployment. **5M**
c) Explain briefly application services of aneka. **5M**

OR

2. a) Explain briefly foundation services in aneka. **8M**
b) With a neat diagram explain aneka service lifecycle. **7M**

3. a) List and explain 6 major categories of currently available configuration for EC2 instances. **5M**
b) Explain the role of cloud technologies on social networking. **5M**
c) Explain with a neat diagram Animato reference architecture. **5M**

OR

4 .a) Explain microsoft windows azure platform architecture with a neat diagram. **8M**
b) Describe how cloud computing technology can be applied to support ECG monitoring. **7M**

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
INTERNAL ASSESMENT TEST: II

FS 543667
An ISO 9001:2015 Certified Institutio

SUB : Cloud Computing-15CS565 **MAX MARKS** : 30
SEM : V Sem **DATE&TIME** : 31/10/18,75 min

NOTE : Answer any **TWO** full questions.

1. a) With a neat diagram explain aneka framework overview **5M**
b) Explain with a neat diagram hybrid cloud deployment. **5M**
c) Explain briefly application services of aneka. **5M**

OR

2. a) Explain briefly foundation services in aneka. **8M**
b) With a neat diagram explain aneka service lifecycle. **7M**

3. a) List and explain 6 major categories of currently available configuration for EC2 instances. **5M**
b) Explain the role of cloud technologies on social networking. **5M**
c) Explain with a neat diagram Animato reference architecture. **5M**

OR

4 .a) Explain microsoft windows azure platform architecture with a neat diagram. **8M**
b) Describe how cloud computing technology can be applied to support ECG monitoring. **7M**

PRINCIPAL
SIET., TUMAKURU.

IInd Internal Scheme of Evaluation

cloud computing - 15CS565

1) a) Aneka framework diagram → 2M

Explanation → 3M

b) Hybrid cloud Diagram → 2M

Explanation of Dynamic provisioning, Workload partitioning, Resource reservation, Accounting reporting → 3M } 5M

c) Application services of Aneka } 2½ × 2M → 5M

① Scheduling service

② Execution service

(OR)

2) a) Foundation services in Aneka

① Storage management → 2M

② Accounting Billing & resource pricing → 3M

③ Resource Reservation 4 types. → 3M

(Basic, Libra, Relay) } 8M

b) Diagram of Aneka service lifecycle → 2M

Explanation of each nodes → 5M } 7M

IService. Start() , IService. Pause()

IService. Continue() , IService. Stop()

3.) a) 6 Major categories of EC2 instances. List → 1M, Expln → 4M } 5M

1) Std. instances - ½M 2) Micro - ½ 3) High memory - ½

4) High - CPU - ½ 5) Cluster compute ↓ 1 6) Cluster GPU

b) Social networking → Facebook uses C.C. tech } 5M
explanation with example tech.

c) Animation Reference Architecture → 2M } 5M
Explanation → 3M

(Amazon. SQS, S3, EC2 instances expl^n)

(OR)

4. a) Azure Platform Architecture Diagram → 3M } 8M
explanation w.r.t compute services → 5M
storage services

b) ECG monitoring using cloud tech Diagram → 2M } 7M
Explanation → 5M

ECG sensor, cloud Env, graphs.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
INTERNAL ASSESMENT TEST: III

FS 543667
An ISO 9001:2015 Certified Instituti

SUB : Cloud Computing-15CS565
SEM : V Sem

MAX MARKS : 30
DATE&TIME : 27/11/18,75 min

NOTE : Answer any **TWO** full questions.

1. a)	Define thread? Explain the relation between process and thread with a neat diagram.	**8M**
b)	Define Task? Describe Message Passing Interface(MPI)program structure.	**7M**
	OR	
2. a)	Explain briefly the following (i) Task library (b) task program model	**8M**
b)	What is workflow? Explain workflow management system with a neat diagram.	**7M**
3. a)	Discuss the features or characteristics of GFS and Amazon S3 .	**8M**
b)	Explain the term NOSQL? Explain Google Bigtable with architecture.	**7M**
	OR	
4 .a)	List and Explain any 3 variation and extension of MapReduce .	**8M**
b)	Explain MapReduce Model workflow with a neat diagram.	**7M**

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY
TUMKUR-572106
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
INTERNAL ASSESMENT TEST: III

FS 543667
An ISO 9001:2015 Certified Institutio

SUB : Cloud Computing-15CS565
SEM : V Sem

MAX MARKS : 30
DATE&TIME : 27/11/18,75 min

NOTE : Answer any **TWO** full questions.

1. a) Define thread? Explain the relation between process and thread with a neat diagram. **8M**
b) Define Task? Describe message passing interface(MPI)program structure. **7M**
OR
2. a) Explain briefly the following (i) Task library (b) task program model **8M**
b) What is workflow? Explain workflow management system with a neat diagram. **7M**
3. a) Discuss the features or characteristics of GFS and Amazon S3 . **8M**
b) Explain the term NOSQL? Explain Google Bigtable with architecture. **7M**
OR
4 .a) List and Explain any 3 variation and extension of MapReduce . **8M**
b) Explain MapReduce Model workflow with a neat diagram. **7M**

PRINCIPAL
SIET., TUMAKURU

Internal Assesment Test - III

Scheme of Evaluation

Cloud computing → 15CS565

1. a) Defn. of thread → 1M.
Diagram process & thread → 3M
Explanation → 4M
} 8M.

b) Defination of Task → 1M.
MPI Structure → 3M
Explanation → 3M
} 8M.

or

2. a) i) Task libraray with example explanation → 4M
ii) Task Program model Expln with example → 4M
} 8M.

b) work-flow defination → 1M.
Diagram → 3M
Explanation → 3M
} 7M.

PRINCIPAL
SIET., TUMAKURU.

3. a) i) features of GFS → 4M
ii) Features of Amazon S3 → 4M
} 8M:

b) NoSQL defination → 1M.
Google Bigtable Diagram → 3M
Explanation → 3M
} 7M.

or

4 a) MapReduce Expln with 3 Variation list → 2M
Explanation with Example → 3x2 → 6M
} 8M

b) MapReduce model workflow Diagram → 3M
Explanation → 4M
} 7M

Shridevi Institute of Engineering and Technology, Tumkur -06
Department of Electrical and Electronics

INTERNAL ASSESSMENT -I

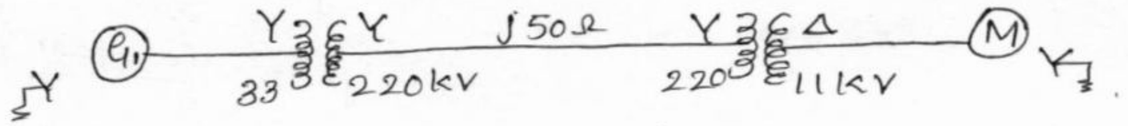
Sub: Power System Analysis 1 **Sub code:** 15EE62
Sem: VI sem **Date:** 14.03.19
Max Marks: 30 **Duration:** 75 Minutes

MODULE-1

1. a) Define per unit quantity & list the advantages. 5M

b) A single line diagram of power system is shown in figure. Draw the impedance diagram. Choose a base of 100 MVA, 220kv in the 50 ohm line. The ratings of the generator, motor & transformer are given below:

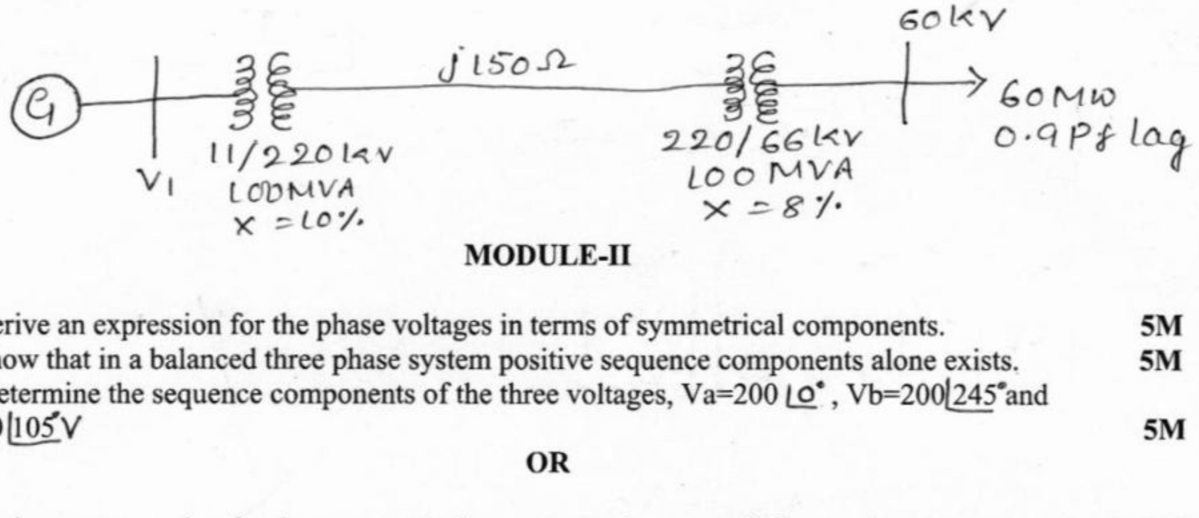
Generator G1: 40 MVA, 25kv, X" = 20%
Synchronous motor: 50 MVA, 11kv, X'' = 30%
Y-Y Transformer T1: 40 MVA, 33/220 kv, X=15%
Y-ΔTransformer T2: 30 MVA, 11/220 kv, X=15%. 10M



OR

2.a) Show that the per unit impedance of a transformer is the same when referred to either its primary side or the secondary side. 5M

b) The one line diagram of a power system is shown in figure. The ratings of the various components are also given. A load of 60MW at 0.9 p.f lagging is tapped from 66kv substation bus which is to be maintained at 60kv. Calculate the terminal voltage of the generator using p.u. method. Select a base of 100 MVA & 220 kv on the transmission line. 10M



MODULE-II

3. a) Derive an expression for the phase voltages in terms of symmetrical components. 5M

b) Show that in a balanced three phase system positive sequence components alone exists. 5M

c) Determine the sequence components of the three voltages, $V_a=200\angle 0^\circ$, $V_b=200\angle 245^\circ$ and $V_c=200\angle 105^\circ$ V 5M

OR

4. a) Derive an expression for the symmetrical components in terms of phase voltages. 5M

b) The positive, negative and zero sequence components of line currents are $20\angle 10^\circ$, $6\angle 60^\circ$ and $3\angle 30^\circ$ A respectively. Determine the line currents. 5M

c) Write the procedure to form the reactance diagram from the single line diagram. 5M

Scheme of Evaluation

14/03/19

Power System Analysis - 1 (15EE62).

I.A 1

1. a) Definition $p.u = \frac{\text{Actual Value}}{\text{Base Value}} \rightarrow 1M$ } 5M

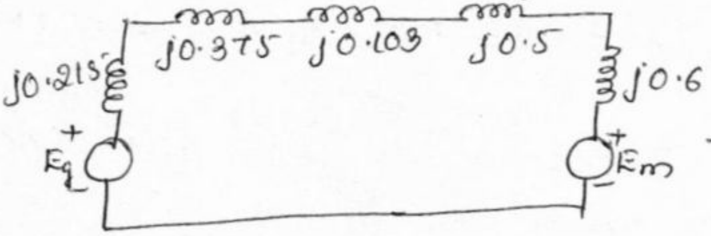
4 advantages → 4M

b). $(KV)_B$ for G s/c = 33KV } 1M
$(KV)_B$ for M s/c = 11kV

Calculation of Reactances.

$X_{G1} = j0.215$
$X_{T1} = j0.375$
$X_{TL} = j0.103$
$X_{T2} = j0.5$
$X_m = j0.6$
} 5M

Reactance diagram:

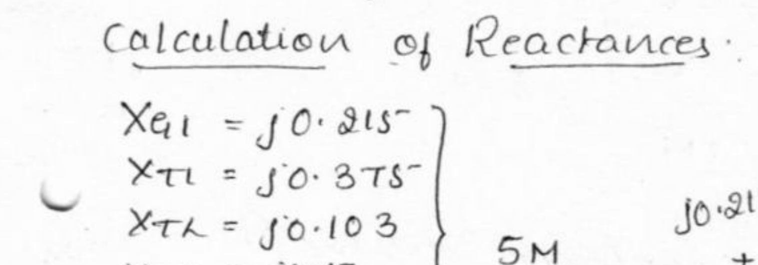


→ 4M

2. a) $(Z_{eq1})_{pu} = (Z_{eq2})_{pu}$ derivation → 5M

b) Reactances calculation :- 3M

Reactance diagram:



→ 3M

$V_L = 0.909\ pu \rightarrow 1M$

$I_L = 641.5 \angle -25.84\ A$
$I_B = 874.77\ A$
$(I_L)_{pu} = 0.733 \angle -25.84\ A$
} 2M

$(V_{Gt})_{pu} = V_L + I_L(jX_{T1} + jX_{TL} + jX_{T2})$
$= 1.112 pu \rightarrow 1M$
$|V_{Gt}| = 12.23\ kV.$

3. a) Derivation $$\begin{bmatrix} V_a \\ V_b \\ V_c \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & a^2 & a \\ 1 & a & a^2 \end{bmatrix} \begin{bmatrix} V_{a0} \\ V_{a1} \\ V_{a2} \end{bmatrix} \longrightarrow 5M$$

b) Derivation:- $$\begin{bmatrix} V_{a0} \\ V_{a1} \\ V_{a2} \end{bmatrix} = \frac{1}{3}\begin{bmatrix} 0 \\ 3V_a \\ 0 \end{bmatrix} \Longrightarrow \underline{\underline{V_{a1} = V_a}} \rightarrow 5M$$

c) $V_{a1} = 197.81\,\underline{\lfloor -3.3^{\circ}}\ V \longrightarrow 2M$

$V_{a2} = 20.15\,\underline{\lfloor 158.2}\ V \longrightarrow 2M$

$V_{a0} = 21.6\,\underline{\lfloor 16.58}\ V \longrightarrow 1M$

4.a) Derivation $\begin{bmatrix} V_{a0} \\ V_{a1} \\ V_{a2} \end{bmatrix} = \frac{1}{3}\begin{bmatrix} 1 & 1 & 1 \\ 1 & a & a^2 \\ 1 & a^2 & a \end{bmatrix}\begin{bmatrix} V_a \\ V_b \\ V_c \end{bmatrix} \rightarrow 5M.$

b)
$$\left.\begin{aligned} I_a &= 27.25\,\underline{\lfloor 21.88}\ A \longrightarrow 2M \\ I_b &= 20.1\,\underline{\lfloor -120.7}\ A \longrightarrow 2M \\ I_c &= 13.7\,\underline{\lfloor 122^{\circ}}\ A \longrightarrow 1M \end{aligned}\right\} 5M$$

c) Procedure to form the reactance diagram. → 5M

4 Steps →

$$X_{pu\,new} = X_{pu,old} \times \frac{(MVA)_{B,new}}{(MVA)_{B,old}} \times \frac{(KV)^2_{B,old}}{(KV)^2_{B,new}}.$$

$$(KV)_B \text{ on LT s/c} = (KV)_B \text{ on HT s/c} \times \frac{\text{LT Rating}}{\text{HT Rating}}$$

$$(KV)_B \text{ on HT s/c} = (KV)_B \text{ on LT s/c} \times \frac{\text{HT Rating}}{\text{LT Rating}}$$

Shridevi Institute of Engineering and Technology, Tumkur -06
Department of Electrical and Electronics

INTERNAL ASSESSMENT -I

Sub: Eectric Motors
Sem: IV sem
Max Marks: 30

Sub code: 17EE44
Date: 15.03.19
Duration: 75 Minutes

MODULE-1

1. a) Derive the torque equation of a DC motor. **5M**

b) Explain the characteristics of a DC shunt motors. **5M**

c) A 4 pole DC shunt motor takes 22 amps from 220v supply. The armature and shunt field resistances are 0.5Ω and 100Ω respectively. The armature is lap connected with 300 conductors if the flux per pole is 20mwb, Calculate the speed and the torque developed. **5M**

OR

2. a) What are the applications of DC motors. **6M**

b) With a neat sketch, explain the operation of a three point starter. **9M**

MODULE-II

3. a) With a neat sketch, explain the Swinburne's test on a Dc Motor **7M**

b) Explain the back to back test on two identical machines and calculate the efficiency of the machines as a generator and motor. **8M**

OR

4. a) Discuss the torque slip characteristics of a three phase IM. **10M**

b) A 8 pole, 50HZ induction motor has an emf in the rotor of frequency 1.5 Hz. Determine the slip and speed of the motor. **5M**

Shridevi Institute of Engineering and Technology, Tumkur -06
Department of Electrical and Electronics

INTERNAL ASSESSMENT -I

Sub: Eectric Motors
Sem: IV sem
Max Marks: 30

Sub code: 17EE44
Date: 15.03.19
Duration: 75 Minutes

MODULE-1

1. a) Derive the torque equation of a DC motor. **5M**

b) Explain the characteristics of a DC shunt motors. **5M**

c) A 4 pole DC shunt motor takes 22 amps from 220v supply. The armature and shunt field resistances are 0.5Ω and 100Ω respectively. The armature is lap connected with 300 conductors if the flux per pole is 20mwb, Calculate the speed and the torque developed. **5M**

OR

2. a) What are the applications of DC motors. **6M**

b) With a neat sketch, explain the operation of a three point starter. **9M**

MODULE-II

3. a) With a neat sketch, explain the Swinburne's test on a Dc Motor **7M**

b) Explain the back to back test on two identical machines and calculate the efficiency of the machines as a generator and motor. **8M**

OR

4. a) Discuss the torque slip characteristics of a three phase IM. **10M**

b) A 8 pole, 50HZ induction motor has an emf in the rotor of frequency 1.5 Hz. Determine the slip and speed of the motor. **5M**

Scheme of Evaluation

15/03/19

Electric Motors (17EE44)

I.A. 1

1. a) Torque equation derivation.

$$T_a = 0.159 \phi Z I_a \left(\frac{P}{A}\right).$$

b) Characteristics of DC Shunt Motor:

$$\left.\begin{array}{lll} \text{i) } T_a/I_a & \text{characteristics} & 2M \\ \text{ii) } N/I_a & \text{---''---} & 2M \\ \text{iii) } N/T_a & \text{---''---} & 1M \end{array}\right\} 5M$$

c)

2. a) Applications of DC Motors

$$\left.\begin{array}{ll} \text{Shunt Motor} & \rightarrow 2M \\ \text{Series Motor} & \rightarrow 2M \\ \text{Compound Motor.} & \rightarrow 1M \end{array}\right\} 5M.$$

b)

$$\left.\begin{array}{l} \text{Circuit diagram} \rightarrow 4M \\ \text{Explaination} \rightarrow 5M. \end{array}\right\} \rightarrow 9M$$

3. a)

$$\left.\begin{array}{l} \text{Circuit diagram} \rightarrow 2M \\ \left.\begin{array}{l} \text{Explaination} \rightarrow \\ \text{Calculation} \rightarrow \end{array}\right\} 5M \end{array}\right\} \rightarrow 7M$$

b) Hopkinson's Test

$$\left.\begin{array}{ll} \text{Circuit diagram} & \rightarrow 2M \\ \text{Explaination} & \rightarrow 2M \\ \text{Calculation of efficiency} & \\ \text{as a Generator} & \rightarrow 2M \\ \text{and as a Motor} & \rightarrow 2M \end{array}\right\} 8M$$

4.a). Torque - Slip characteristics of IM.

Graph.

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY, TUMKUR-06
(An ISO 9001:2008 Certified Institution)
Department of Electrical & Electronics Engineering

Power system Analysis I

SECOND-INTERNALS

VI Semester **Duration: 75 Minutes**
Max Marks: 30 **date: 13.04.19**

Module-1

1.a) Derive an expression for symmetrical components of phase voltages and line voltages in three phase star connected system. **7M**

b) The 3 line voltages of a 3 phase system are $|V_A|$= 400V, $|V_B|$= 500V & $|V_C|$= 600V. Determine the sequence components of the line & phase voltages. **8M**

OR

2. a) Derive an expression for the three phase complex power in terms of symmetrical components. **7M**

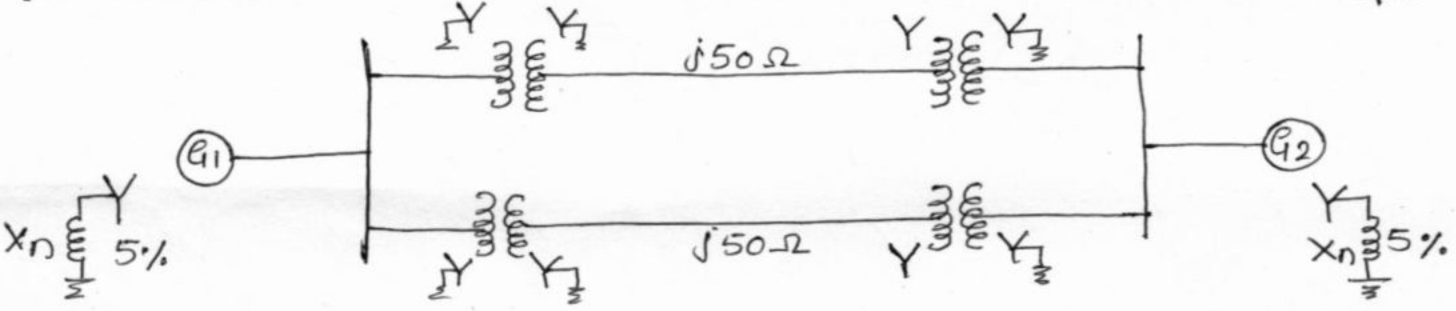
b) Derive an expression for symmetrical components of phase voltages and line voltages in three phase delta connected system. **8M**

Module-II

3a) Draw the positive, negative and zero sequence networks for the power system shown in the figure. Choose a base of 50MVA, 220KV in the 50Ω transmission lines. Mark all the reactance in p.u. The ratings of the generators and transformers are

Gen G1 & G2: 25MVA, 11KV, X''=20%.
Three phase transformers each rated: 20MVA, 11Y/220Y kV, X=15%.

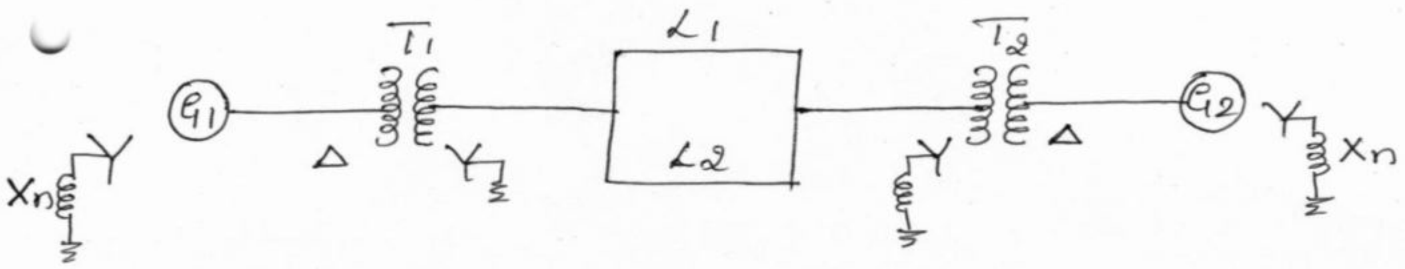
The negative sequence reactance of each synchronous machine is equal to its sub transient reactance. The zero sequence reactance of each machine is 8%. Assume that zero sequence reactance of lines are 250% of their positive reactances. **14M**



OR

4. a) Define sequence impedances & sequence networks **6M**

b) Draw the positive, negative and zero sequence networks for the power system shown in the figure. **9M**



——x——

Power System Analysis - I 13/04/19

Second Internals

Scheme of Evaluation

1.a) Derivation :

$$\left.\begin{aligned} V_{A1} &= j\sqrt{3}\,V_{a1} \\ V_{A2} &= -j\sqrt{3}\,V_{a2} \\ V_{A0} &= 0 \end{aligned}\right\} \rightarrow 7M$$

b) Figure → 1M.

$$\left.\begin{aligned} \alpha &= 82.82^\circ \\ \beta &= 55.77^\circ \end{aligned}\right\} \rightarrow 3M$$

$V_{A0} = 0$

$$\left.\begin{aligned} V_{A1} &= 492.84\angle 19.27^\circ\,V \\ V_{A2} &= 117.34\angle -137.4^\circ\,V \\ V_{a1} &= 285.84\angle -80.73\,V \\ V_{a2} &= 67.75\angle -47.4\,V \end{aligned}\right\} \rightarrow 4M.$$

2.a) Derivation $S = 3\{V_{a0}I_{a0}^* + V_{a1}I_{a1}^* + V_{a2}I_{a2}^*\} \rightarrow 7M$

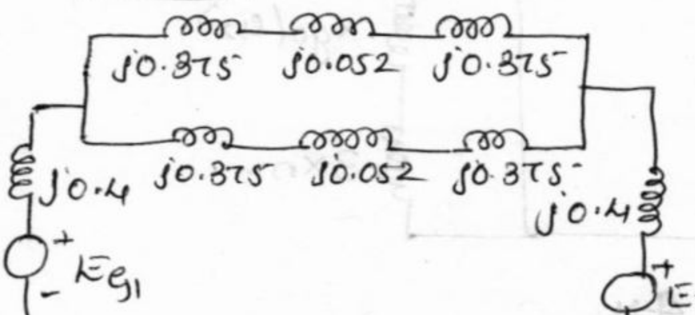
b) $I_{a1} = j\sqrt{3}\,I_{A1}$ 3M

$I_{a2} = -j\sqrt{3}\,I_{A2}$ 3M Derivation.

$I_{a0} = 0$ 2M

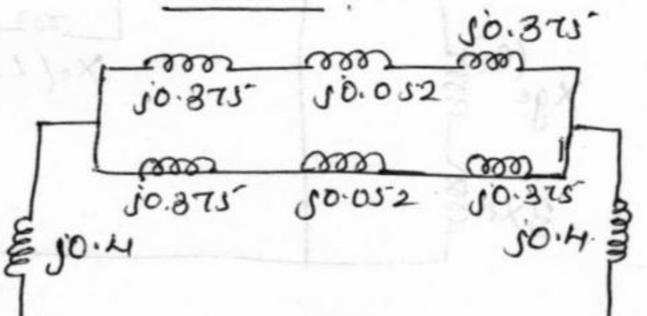
3.a) $(kV)_B$ for G_1 & G_2 s/c = 11 kV. Calculations. 5M

PSN.



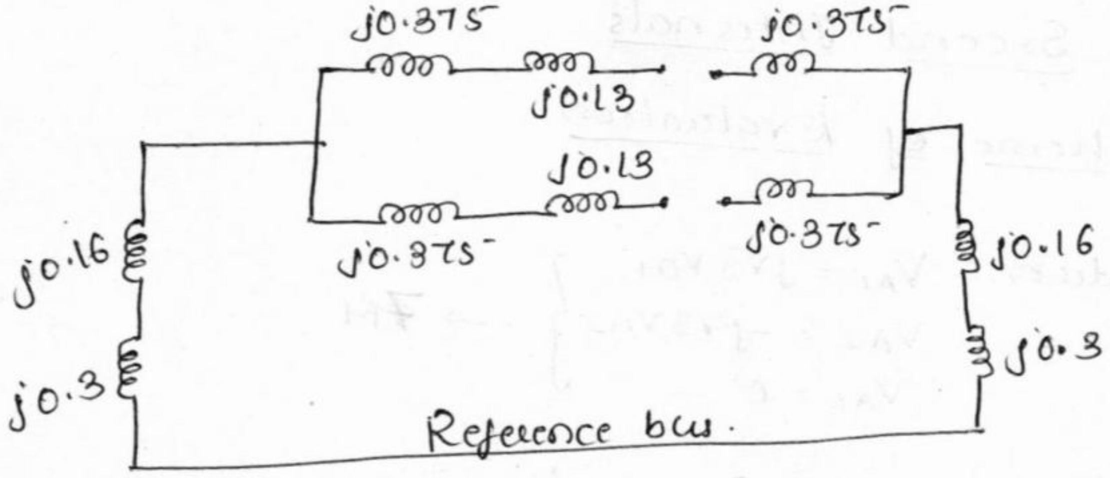
→ 4M

NSN.



→ 2M

Zero Seq N/w

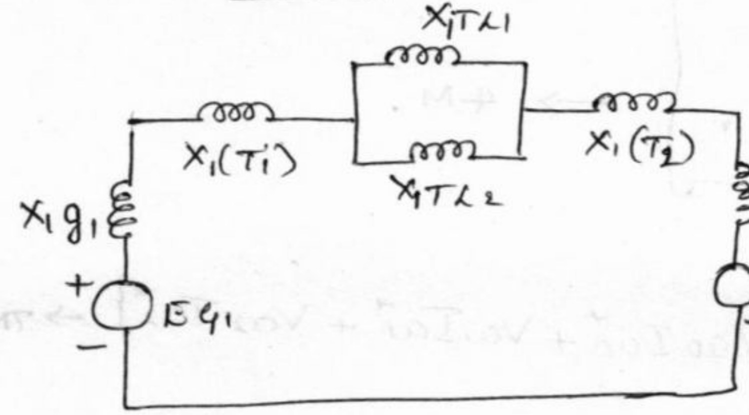


→ 4M.

4.a) Definitions each → 1M.

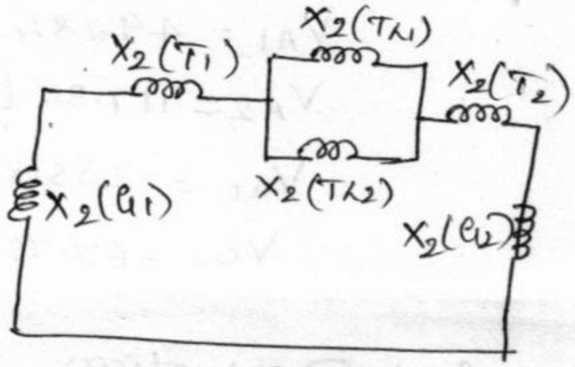
6M

b) PSN.



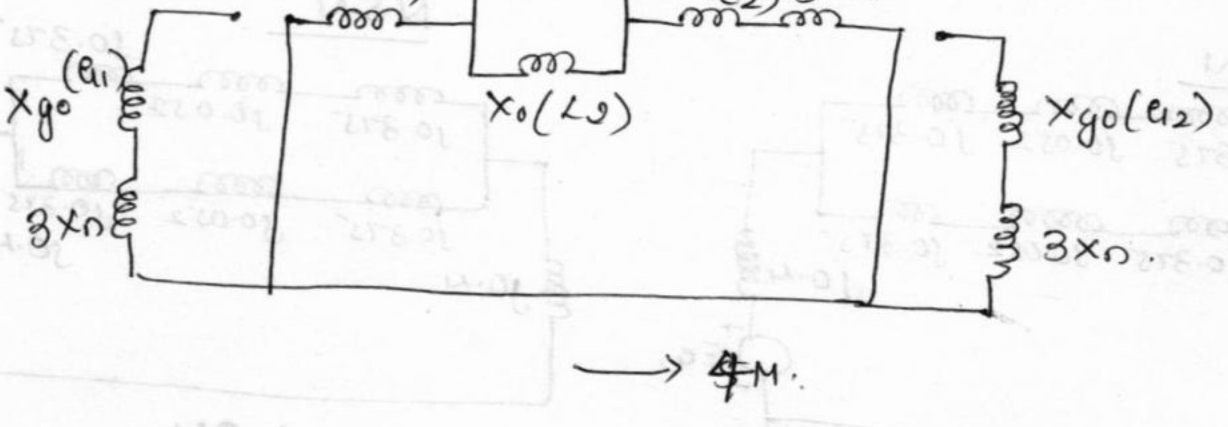
→ 3M

NSN



→ 2M.

Zero Sequence N/w



→ 4M.

Sri Shridevi Charitable Trust (R.)

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY

(Recognised by Govt. of Karnataka, Affiliated to VTU, Belagavi and Approved by AICTE, New Delhi)
Sira Road, Tumakuru - 572 106. Karnataka.

FS 543687
An ISO 9001:2015 Certified Institution

Phone: 0816-2212629 | Fax: 0816-2212628 | Email: info@shridevienginееring.org | Web: http://www.shridevienginееring.org

Department of Electrical & Electronics Engineering

SECOND INTERNAL ASSESSMENT-2

Course: CS
SEM: VI SEM
Max Marks: 30

Course code: 15EE61
Date: 15.04.19
Duration: 75 Minutes

Answer **any 2 questions each from Q (1) or (2) and (3) or (4)**

Q.1 (a) Determine the stability of the system represent by following characteristic equation, $S^6+2S^5+8S^4+12S^3+20S^2+16S+4=0$. (7M)

(b) A unity feedback system control has G(s)=K(s+13)/s(s+3)(s+7).Using Rouths criterion calculate the range of K for which the system is i)stable ii)has its closed loop, poles more negative than-1. (8M)

Q.2 (a) Find the transfer function for the given network. (7M)

(b) For the system block diagram is given below, find 1) C(S)/E(S) if N(S) =0. (8M)

Q.3 (a) For the characteristics equations given below determine the number of roots with real part $S^8+S^7+4S^5+14S^4+11S^3+20S^2+9S+9=0$ (7M)

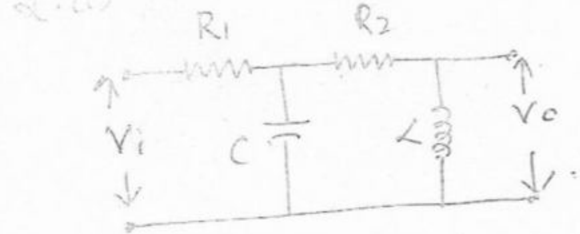
(b) For the signal flow graph, find the overall transfer function by, 1) Block diagram reduction technique,2) Verify the result by masions gain formula. (8M)

Q.4 a) Using Masions gain formula, find the gain of the following system in figure below (7M)

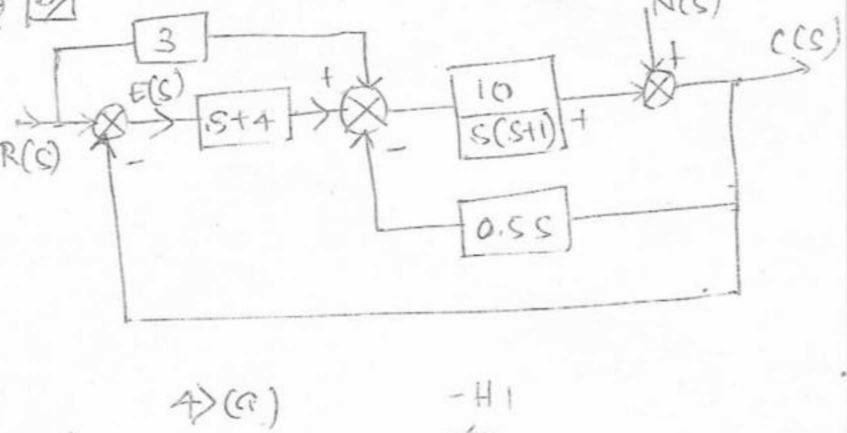
b) For the system represented by the following equation, find the T F X(S)/U(s) by signal flow graph (8M)

$x = x_1 + \alpha_3 u$; $\dot{x}_1 = -\beta_1 x_1 + x_2 + \alpha_2 u$; $\dot{x}_2 = -\beta_2 x_1 + \alpha_1 u$

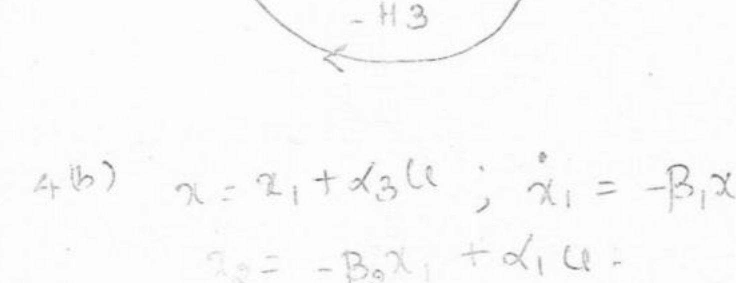
2.(a)



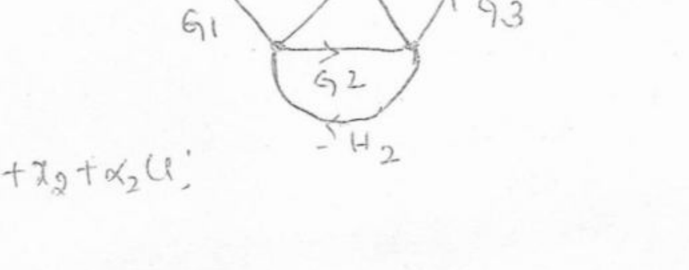
2 b



3> b>



4>(a)



4(b) $x = x_1 + \alpha_3 u$; $\dot{x}_1 = -\beta_1 x_1 + x_2 + \alpha_2 u$;
$x_2 = -\beta_2 x_1 + \alpha_1 u$.

Scheme of Evaluation-2.

Control Systems-15EE61

1. a) $s^6 + 2s^5 + 8s^4 + 12s^3 + 20s^2 + 16s + 16 = 0$.

$A(s) = 2s^4 + 12s^2 + 16 = 0$

$\frac{dA}{ds} = 8s^3 + 24s = 0$ } → 3(M)

s^0 16 → Routh array } → [3m].

$s = \pm j\sqrt{2}$ & $s = \pm j2$ → [1M]

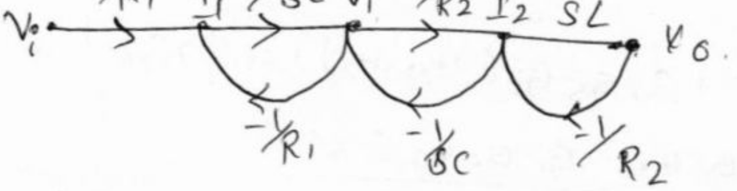
b). $1 + G(s)H(s) = 0$

$s^3 + 10s^2 + 21s + ks + 13k = 0$.

i) $0 < K < 70$ → [6M]

ii). $1 < K < 8$ → [2M]

Q.2 (a) T.F.



[4M]

$$\frac{V_0(s)}{V_i(s)} = \frac{sL}{s^2 L R_1 C + s[L + R_1 R_2 C] + (R_1 + R_2)}$$ [3M]

(b) $\frac{C(s)}{E(s)}$ if $N(s) = 0$; Block diagram Reduction 4M

$\frac{C(s)}{E(s)} = \frac{10(s+7)}{s^2 + 6s - 30}$ when $N(s) = 0$ → (4M)

3. a) $s^8 + s^7 + 4s^5 + 14s^4 + 11s^3 + 20s^2 + 9s + 9 = 0$

$$\begin{array}{cccccc}
s^8 & 1 & 0 & 14 & 20 & 9. \\
s^7 & 1 & 4 & 11 & 9 & 0 \\
s^5 & -4 & 3 & 11 & 0 & 0 \\
s^4 & \frac{+19}{4} & \frac{55}{4} & +\frac{9}{4} & 0 & 0 \\
s^3 & & & & &
\end{array}$$

b)

4 a) $K = 6$, $T_1 = G_1G_2G_3$, $T_2 = G_4G_5G_6$, $T_3 = G_1G_7G_6$, $T_4 = G_4G_8G_3$

$T_5 = G_4G_8(-H_2)G_7G_6$, $T_6 = G_1G_7(-H_1)G_8G_3$

$L_1 = -G_5H_1$, $L_2 = -G_2H_2$, $L_3 = G_7H_1G_8H_2$

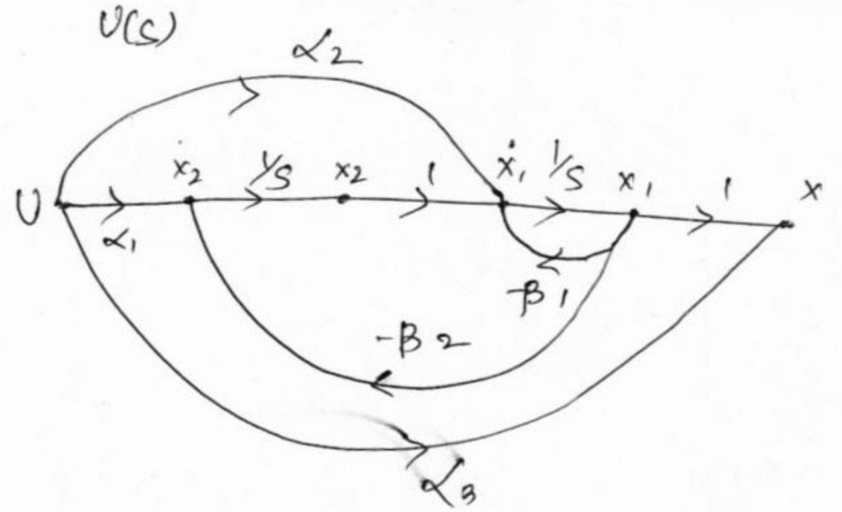
$L_1L_2 = G_2G_5H_1H_2$

$\Delta = 1 + G_5H_1 + G_2H_2 - G_7G_8H_1H_2 + G_2G_5H_1H_2$

$$\text{Gain} = \frac{G_1G_2G_3(1+G_5H_1) + G_4G_5G_6(1+G_2H_2) + G_1G_7G_6 + G_4G_8G_3 - G_4G_8G_7G_6H_2 - G_1G_3G_7G_8H_1}{1 + G_5H_1 + G_2H_2 - G_7G_8H_1H_2 + G_2G_5H_1H_2}$$ [5M]

4. a

4(b).. $\frac{X(s)}{U(s)}$



→ [8m]

$$\frac{X}{U} = \frac{s^2\alpha_3 + s(\alpha_2 + \alpha_3\beta_1) + (\alpha_1 + \alpha_3\beta_2)}{s^2 + s\beta_1 + \beta_2}.$$

3. b)

i) $$\frac{C(s)}{R(s)} = \frac{G_1G_2G_3G_4 + G_1G_2G_4G_5}{1 + G_2H_1 + G_4H_2 + G_2G_4H_1H_2 + G_1G_2G_3G_4H_3 + G_1G_2G_4G_5H_3} \rightarrow 4m$$

ii). $$\frac{C(s)}{R(s)} = \frac{G_1G_2G_3 4G_4 + G_1G_2G_4 5}{1 + G_2H_1 + G_4H_2 + G_1G_2G_3G_4H_3 + G_1G_2G_4G_5H_3 + G_2G_4H_1H_2}$$

→ 4m

Sri Shridevi Charitable Trust (R.)

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY

(Recognised by Govt. of Karnataka, Affiliated to VTU, Belagavi and Approved by AICTE, New Delhi)
Sira Road, Tumakuru - 572 106. Karnataka.
FS 543667
An ISO 9001:2015 Certified Institution
Phone: 0816-2212629 | Fax: 0816-2212628 | Email: info@shrideviengineering.org | Web: http://www.shrideviengineering.org

Department of Electrical & Electronics Engineering

SECOND INTERNAL ASSESSMENT-2

Course: PSOC
SEM: VIII SEM
Max Marks: 30

Course code: 15EE81
Date: 15.04.19
Duration: 75 Minutes

Answer any 2 questions each from Q (1) or (2) and (3) or (4)

Q.1 (a) Write the iterative algorithm and flow chart for short term hydrothermal scheduling **(8M)**

(b) A two plant system has the following characteristics $F_T = 20P_{GT} + 0.04 P_{GT}^2$ Rs/h, $Q = 7.5P_{GH} + 0.004P_{GH}^2 m^3/s$, $\gamma = 4.1*10^{-4}$ Rs/m^3, λ=70RS/Mwh, B_{HH} =0.0025M/W. Determine the generation of each plant, the load on the system and the losses. **(7M)**

or

Q.2 (a). Explain the basic generator control loops. **(7M)**

(b) Explain shunt capacitors and shunt reactors. **(8M)**

Sri Shridevi Charitable Trust (R.)

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY

(Recognised by Govt. of Karnataka, Affiliated to VTU, Belagavi and Approved by AICTE, New Delhi)
Sira Road, Tumakuru - 572 106. Karnataka.
FS 543667
An ISO 9001:2015 Certified Institution
Phone: 0816-2212629 | Fax: 0816-2212628 | Email: info@shrideviengineering.org | Web: http://www.shrideviengineering.org

Department of Electrical & Electronics Engineering

SECOND INTERNAL ASSESSMENT-2

Course: PSOC
SEM: VIII SEM
Max Marks: 30

Course code: 15EE81
Date: 15.04.19
Duration: 75 Minutes

Answer any 2 questions each from Q (1) or (2) and (3) or (4)

Q.1 (a) Write the iterative algorithm and flow chart for short term hydrothermal scheduling **(8M)**

(b) A two plant system has the following characteristics $F_T = 20P_{GT} + 0.04 P_{GT}^2$ Rs/h, $Q = 7.5P_{GH} + 0.004P_{GH}^2 m^3/s$, $\gamma = 4.1*10^{-4}$ Rs/m^3, λ=70RS/Mwh, B_{HH} =0.0025M/W. Determine the generation of each plant, the load on the system and the losses. **(7M)**

or

Q.2 (a). Explain the basic generator control loops. **(7M)**

(b) Explain shunt capacitors and shunt reactors. **(8M)**

Q.3 (a) Derive the equation for short term hydrothermal scheduling using penalty factors. **(8M)**

(b) A steam plant and a hydro plant supply a load of 500MW for 12h and 300MW for 12h in a day. The thermal plant characteristics are given by $F(P_{GT}) = 0.046P_{GT}^{2} + 40P_{GT} + 100$unit cost/h, the hydro plant characteristics is given by $Q = 0.003\,P_{GH}^{2} + 0.05P_{GH}$ m^3/s. The loss is given by $P_{LOSS} = 0.001\,P_{GH}^{2}$ .The value of γ is 80 .Find the scheduling of power and the total discharge .Also determine the daily operating cost of the thermal plant and the water used daily by the hydro plant. Obtain the schedule by neglecting losses. **(7M)**

or

Q.4 (a) Explain the tap changing transformers with neat diagram **(8M)**

(b) What are the functions of AGC? **(7M)**

Q.3 (a) Derive the equation for short term hydrothermal scheduling using penalty factors. **(8M)**

(b) A steam plant and a hydro plant supply a load of 500MW for 12h and 300MW for 12h in a day. The thermal plant characteristics are given by $F(P_{GT}) = 0.046P_{GT}^{2} + 40P_{GT} + 100$unit cost/h, the hydro plant characteristics is given by $Q = 0.003\,P_{GH}^{2} + 0.05P_{GH}$ m^3/s. The loss is given by $P_{LOSS} = 0.001\,P_{GH}^{2}$ .The value of γ is 80 .Find the scheduling of power and the total discharge .Also determine the daily operating cost of the thermal plant and the water used daily by the hydro plant. Obtain the schedule by neglecting losses. **(7M)**

or

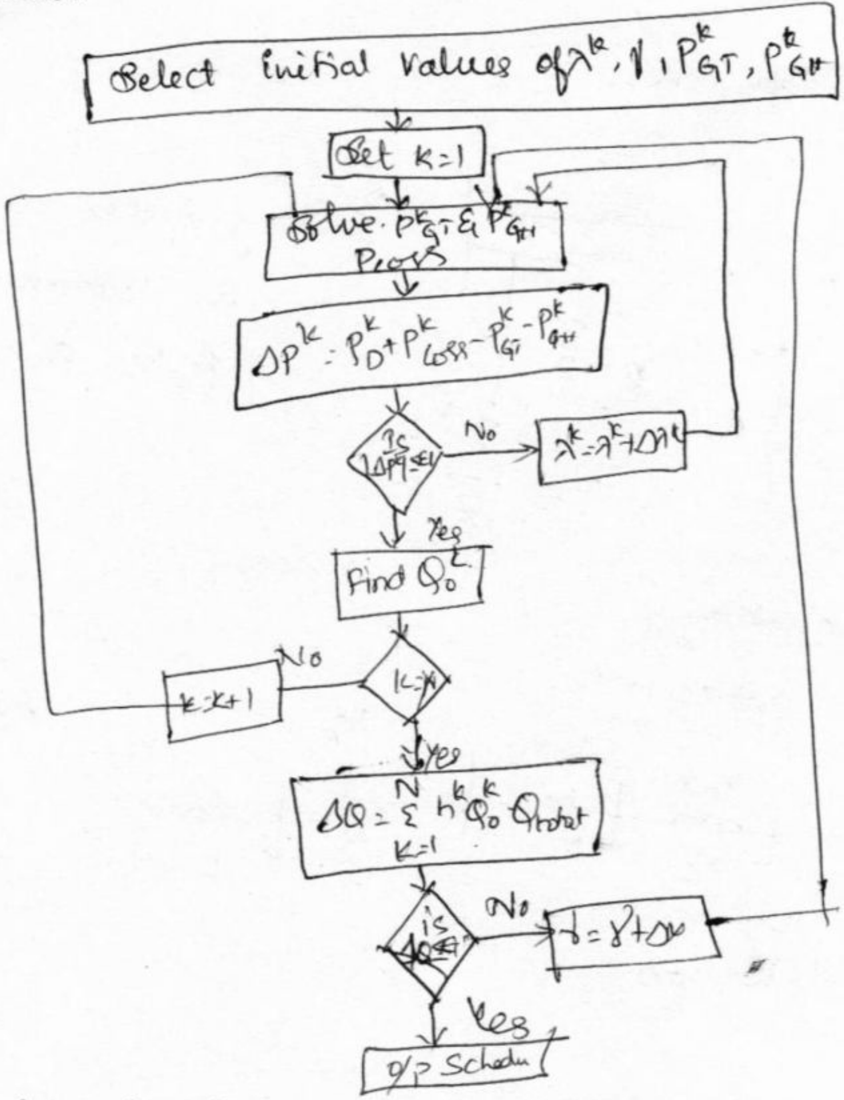
Q.4 (a) Explain the tap changing transformers with neat diagram **(8M)**

(b) What are the functions of AGC? **(7M)**

Scheme of Evaluation-2

PSOC - 15EE81

i) Flow chart.


Select initial values of $\lambda^k, \gamma, P_{GT}^k, P_{GH}^k$
Set k=1
Solve. P_{GT}^k & P_{GH}^k P_{Loss}
$\Delta P^k = P_D^k + P_{Loss}^k - P_{GT}^k - P_{GH}^k$
is $|\Delta P^k| \le \epsilon$
No
$\lambda^k = \lambda^k + \Delta\lambda^k$
Yes
Find Q_0^k
$k = K$
No
$k = k+1$
Yes
$\Delta Q = \sum_{k=1}^{N} n^k Q_0^k Q_{total}$
is $\Delta Q \le \epsilon$
No
$\gamma = \gamma + \Delta\gamma$
Yes
o/p Schedu

[4M]

Algorithm [4M]

b) $P_{GT} = 625\,MW$. [7M]

$$\frac{dQ}{dP_{GH}} = 7.5 + 0.008 P_{GH}$$

$$\gamma \left[\frac{dQ}{dP_{GH}}\right]\left[\frac{1}{1 - \frac{\partial P_{Loss}}{\partial P_{GH}}}\right] = \lambda$$

$P_{GH} = 162.87\,MW$

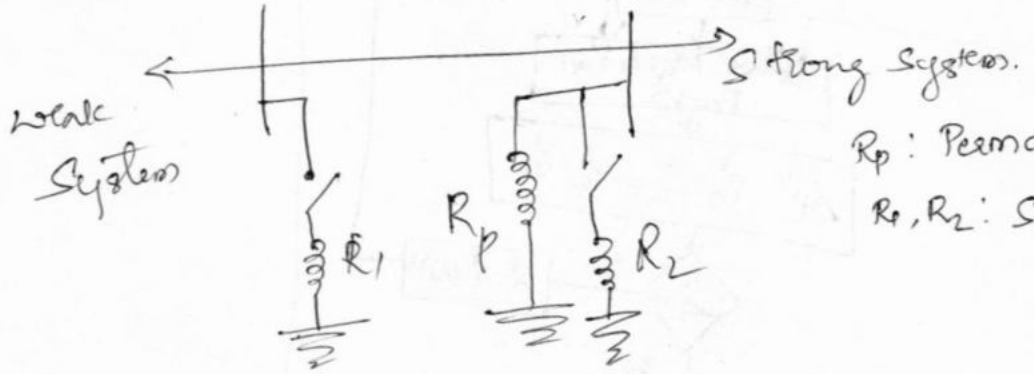
$P_{Loss} = 66.32\,MW$.

$P_D = 721.55\,MW$

Q.2 a) Diagram → [3M]

Explanation → [4M]

b) Shunt Capacitors.

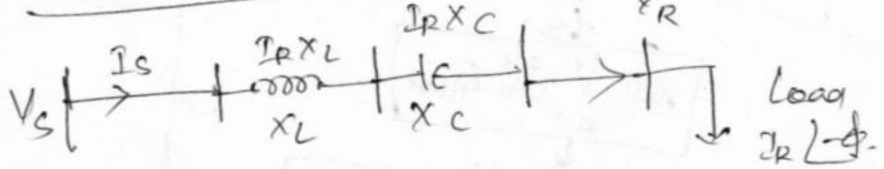


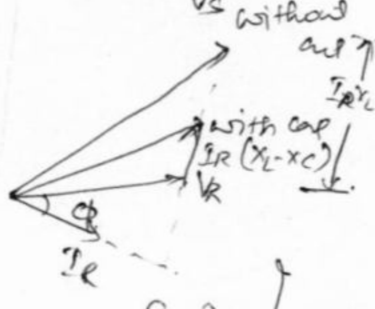
R_p : Permanent

R_1, R_2 : Switched. } → 4[M]

Explanation

Series capacitors





(b) } [4m]

Explanation

Q.3 (a)

$$\gamma \frac{dQ_0}{dP_{GH}}\left[1 + \frac{\partial P_{Loss}}{\partial P_{GH}}\right] = \lambda \quad \rightarrow [8M]$$

$$\gamma \frac{dQ_0}{dP_{GH}} = \lambda , \quad \frac{dF_T}{dP_{GT}} = \lambda$$

(b) $P_D = 500MW$,

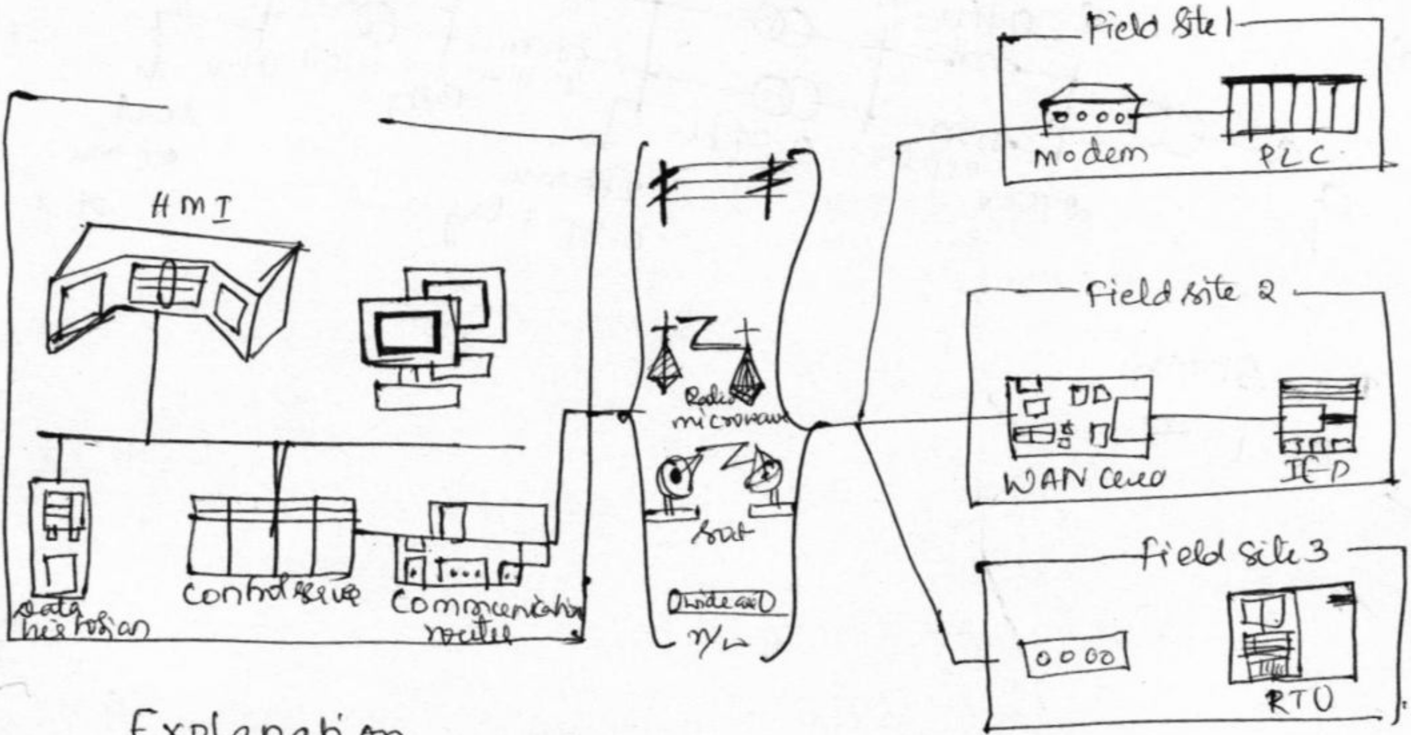
$P_{GT} = 400MW$. ✓

$P_{GH} = 60MW$ ✓

Daily operating cost of thermal plant = 325267 . } [7M].

Water daily used = $5.218 \times 10^6 m^3$

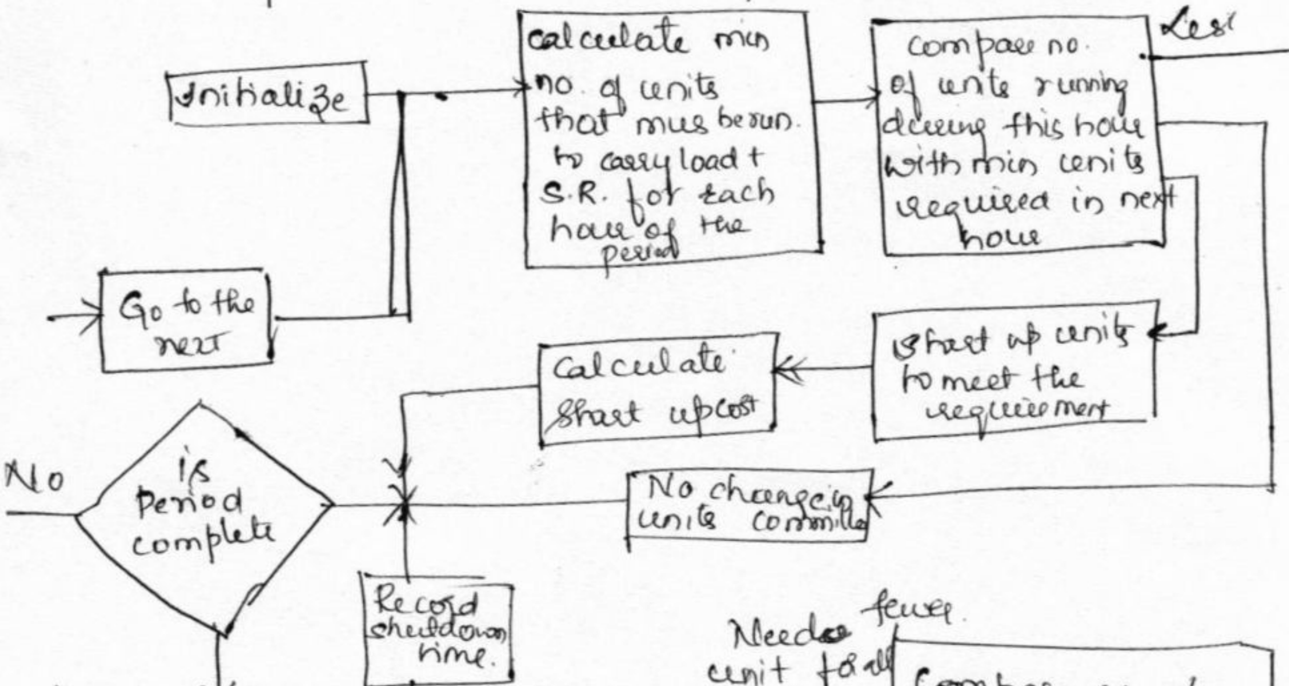
Q.3 (a). [4M]



Explanation

⟶ [3 M]

(b) Priority List method Explanation. → [4M]


Initialize
calculate min no. of units that must be run to carry load + S.R. for each hour of the period
compare no. of units running during this hour with min units required in next hour
Less
Start up units to meet the requirement
Calculate Start up cost
No change in units committed
is Period complete
No
Go to the next
Record shutdown time.
Needs fewer unit for all H hours
Shutdown units based on priority list
Compare no. of units running this hour with that required in next H hours
Give committed units, hourly, for entire period

Flow chart for priority

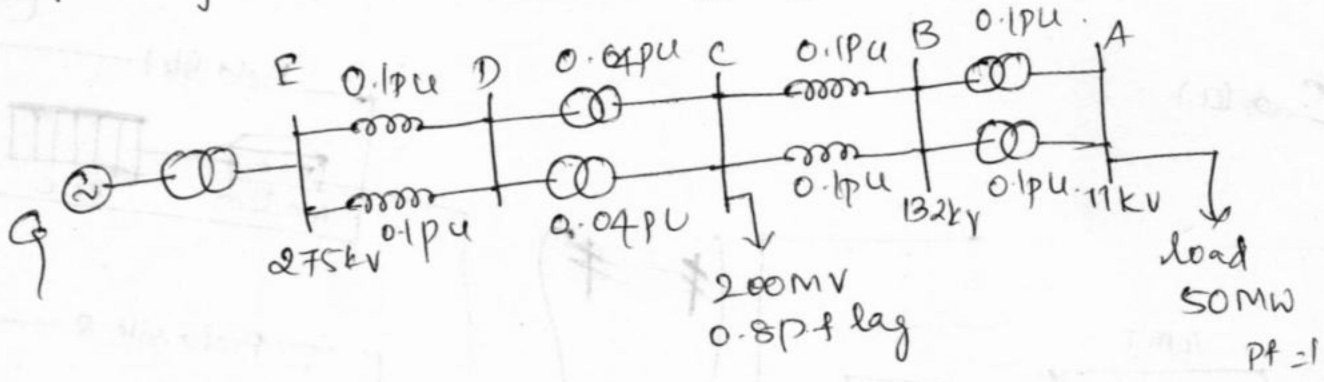
Explanation ⟶ [3M]

Q.4 (a) Unit commitment Explanation → [1M]

Thermal constraints → [3M]

Spinning reserve → [3M]

(b)



$P_1 = 50MW$.

Pf = 1