ACY 2019-20

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Sri Shridevi Charitable Trust (R.)

SHRIDEVI INSTITUTE OF ENGINEERING & TECHNOLOGY

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NH-4, Sira Road, TUMAKURU - 572106, Karnataka.

SHRIDEVI EDUCATION

DEPARTMENT OF CIVIL ENGINEERING

ASSIGNMENT BOOK

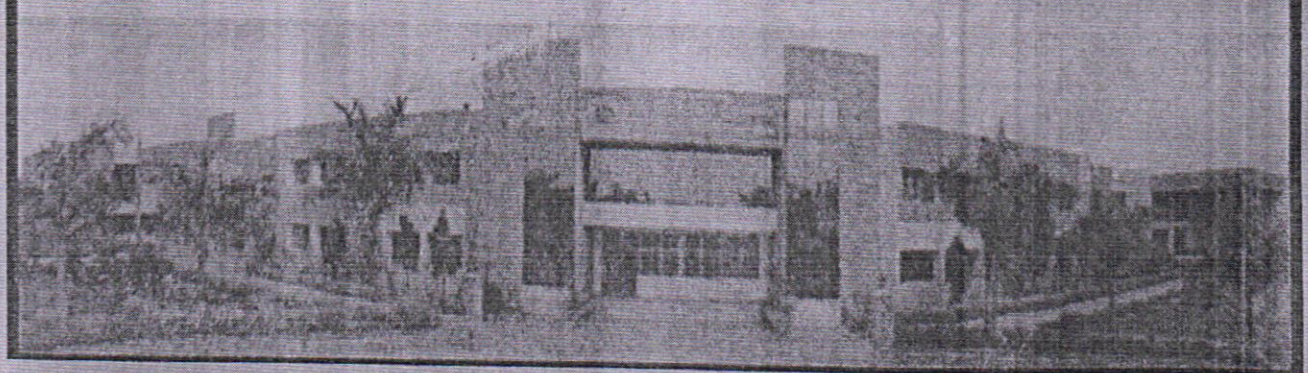
Name : Mr. / Ms. VISHWANATHA. H.P

Subject : BUILDING MATERIALS AND CONSTRUCTION

Subject Code : 18CV34

Semester : III

USN : 1 S V 1 8 C V 0 3 6



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ASSIGNMENT MARKS

Date	Assignment No.	Max. Marks	Marks Obtained	Course Instructor Signature
06/09/19	1	10	10	
21/10/19	2	10	10	
06/11/19	3	10	10	
26/11/19	4	10	10	
	5			
	Average	10	10	

CERTIFICATE

This is to certify that Mr./Ms. VISHWANATHA.H.P

with USN 1SV18CV036 has satisfactorily completed the course of assignments in the subject of BUILDING MATERIALS & CONSTRUCTIONS as prescribed by the Visvesvaraya Technological University for the II Year / IV Sem year / semester BE B.E./M.Tech. MBA degree course in the year 2019-2020

Signature of the Student

Course Instructor

Head of the Department

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ASSIGNMENT-1

Write the short notes on preliminary investigation of subsoil

⇒ Inspection of the site is the first step which should be taken prior to the design of construction of structure this include

1. Whether the ground is soft, hard, marshy, water log grade (or) made up type
2. Classification of soil by visual examination.
3. Behaviour of the ground during change in ground water level.
4. Whether there is likelyhood of excessive movement of ground.
5. Whether the subsoil, water contains sulphates or other chemical which may cause damage to foundation

What is meant by foundation, describe the functions of foundation

⇒ Foundation: It is a substructure which transmits the load of the superstructure to the underlying soil. It is the most critical part of a building which is to be designed carefully

Functions of foundations:

1) Reduction of load intensity
2) Even distribution of load
3) Provision of level surface
4) Lateral stability
5) Safety against under mining

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c. protection against soil moment

3. Explain the requirements of good foundation

* Not effected by future performance
* The foundation should be located in such a way that it is able to resist any unexpected factors influence
* Sustain dead and imposed load
* Rigid foundation
* Deep enough beyond the level of swelling & shrinking

4) What are the causes of failure of foundation. what are the remedial measure would you suggest?

* Non-uniform settlement of subsoil and masonry
* Alternative swelling and shrinkage of subsoil.
* Action of weathering agencies like sun, rain, wind and earthquake forces
* Root trees and shrubs which penetrate into the soil which has more affinity towards water which may leads to the failure of foundation

5) Mention the types of foundation and explain various types of shallow foundation.

→ (i) Deep foundation
(ii) Shallow foundation

(a) Shallow foundation: The foundation is shallow when its depth is equal to or less than its width

(b) Deep foundation: The depth is equal to or greater than its width

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Shallow foundation:

① Spread footing / Isolated footing / Independent footing
② Combined footing
③ Strap footing
④ Mat foundation

a) Spread footing: Spread footings are those which spread the super imposed load over the larger area. Spread footing supports either column or wall. Spread footing are classified as the following types

① Single footing
② Stepped footing
③ Sloped footing
④ Wall footing without step
⑤ Stepped footing for wall
⑥ Grillage foundation

b) Combined footing:

Spread footing which support two or more columns is formed as combined footing

Combined footing may be of the following types

① Rectangular combined footing
② Trapezoidal combined footing
③ Combine column wall footing

c) Strap footing: If the independent footing of two columns connected by a beam. It is called a strap footing. A strap

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footing may be used in the distance b/w the column is great that a combined trapizoidal

d) Mat foundation or Raft foundation:

A raft or mat is a combined footing that covers the entire area beneath a structure and supports all the walls and columns when the allowable soil pressure is low, or the building load are heavy the are of spread footing cover more than half of the area and it prove more economical to use mat or raft foundation

10/10/19

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ASSIGNMENT - 2

1. What are the ingredients of brick earth, Explain.

=> Alumina : It is the chief constituent of every kind of clay. a good brick earth should contain about 20% to 30% of alumina. This constituent imparts plasticity to the earth, so that it can be moulded

=) Silica :- It is present either free as sand (or) in combination as silicate of alumina - A good brick earth should contain about 50% to 60% of silica. The presence of this constituent prevents cracking, shrinking and warping of raw bricks. The durability of bricks depends largely on the proper proportion of silica in brick earth

=) Lime :- A small quantity of lime not exceeding 5% is desirable in good brick earth. It should be present in a very finely powdered state become even small particle of the size of a pin head cause flaking of the bricks.

=> Oxide of iron :- A small quantity of oxide of iron to the extent of about 5% to 6% is desirable in good brick earth. It helps lime to fuse sand. It also imparts red colour to bricks. Excess of oxide of iron makes the bricks dark blue (or) black

=> Magnesia :- A small quantity of magnesia in brick earth imparts yellow tint to the bricks and decreases shrinkage. But excess of magnesia leads to the decay of bricks.

2. Difference b/w kilns and clamps burning.

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No	Item	Clamp burning	Kiln burning
1.	Capacity	About 90000 to 100000 bricks can be prepared at a time	Average 25000 bricks can be prepared per day
2.	cost of fuel	Low as grass, cow dung, Litter etc, may be used	Usually high as coal dust is to be used
3.	Initial cost	Very low as no structures are to be built	more as permanent structures to be constructed
4	Quality of bricks	Percentage of good quality bricks is small about 60%	percentage of good quality bricks is more about 90%
5	Regulation of fire	It is not possible to control or regulate fire during the process of burning	Fire is under control throughout the process of burning
6	Structure	Temporary structure	Permanent structure
7	Time of burning & cooling	It requires about 2 to 6 months for burning and cooling of bricks	Actual time for burning one chamber is about 24 hours and only 12 days are required for cooling
8.	Wastage of heat	There is considerable wastage of heat from top inside and hot flue gas is not properly utilized	Hot flue gas is used to dry and pre-heat raw bricks Hence wastage of heat is the least.

3. What are the causes of deterioration of stone. How do you preserve them? Explain.

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Deterioration of Stones:

1. Alternate wetness and drying: Stones are made wet by various agencies such as rain, frost, dew, etc. such wet surface is dried by sunshine. It is found that stones subjected to such alternate wetness and drying wear out quickly.

2. Frost:- In hill station or very cold places, moisture present in the atmosphere is deposited in pores of stones. At freezing point, this moisture freeze and in doing so, it expands in volume and causes the splitting of stone.

3. Living Organisms: Some living organisms like worms and bacteria act upon stones and deteriorates them.

4. Moments of chemicals:- If stones of different varieties such as limestone and sandstone are used side by side in the same structure chemicals formed by the action of atmospheric agencies on one variety may move on the other and causes the deterioration of that and other.

5. Temperature variations: Rise of temperature results in expansion of stones. Fall of temp causes contraction of stones. If rise and fall of temperature are frequent, stones are easily deteriorated.

6. Vegetable growth:- Roots attracted moisture & keeps the stone surface damp. At the same time they try to expand.

Preservation of Stone:

→ By using of preservatives:

1. Coal tar: Colour of coal tar produces objectional stone and surface coated with coal tar absorbs heat.

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(iii) Linseed oil :- This preservatives may be used either as raw linseed oil or boiled linseed oil. Raw linseed oil doesn't disturb the original shade of stone. Boiled linseed oil lasts for long period but it makes the surface dark.

(iv) Paint :- It is applied under pressure, if deep penetration is required.

(v) Paraffin :- This preservatives may be used alone or it may be dissolved in naptha and then applied on stone.

(vi) Solution of alum and soap :- Alum and soft soap are taken in proportion of about ~~Alum and soft soap are taken in~~ 75 gm and 50 gm respectively and they are dissolved in a 1 litre of water

(vii) Solution of baryta :- A solution of barium hydroxide $Ba(OH)_2$ preservative is used when decay of stone is mainly due to calcium sulphate

4. Pipe sheet in pile foundation? Describe the types of pile foundation based on its function.

⇒ Pile foundation is that type of deep foundation in which the loads are taken to a low level, by means of vertical members which may be of timber, concrete or steel.

Types of pile foundation based on function :-

(1) End bearing piles.
(2) Friction piles
(3) Combined end bearing and friction pile
(4) compaction pile.

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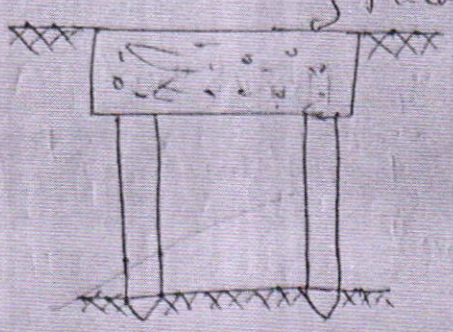
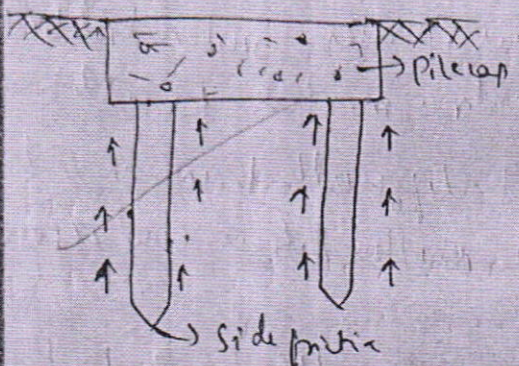


① End bearing pile:-

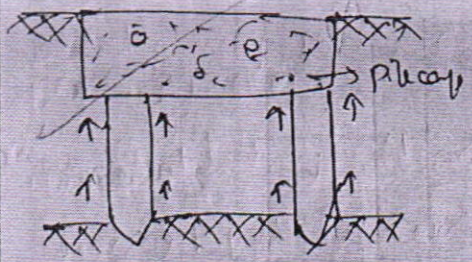
These are used to transfer load through water or soft soil in a suitable bearing. Such piles are used to transmit heavy loads safely to multistorey building.

② Friction piles



These are used to transfer loads to a depth of a friction. Such piles are used in granular soil where the depth of hard stratum is more

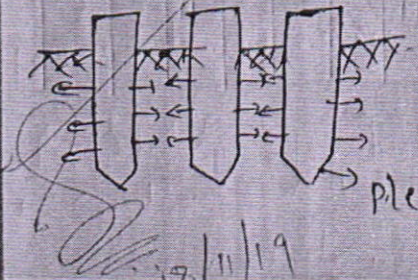
③ Combination of end bearing & friction pile:-



These are used to compact loose granular soil, thus increasing their bearing capacity. The compaction piles themselves do not carry a load hence they may be of weak material (such as timber, bamboo sticks)

④ Compactive pile:-

(such as timber, bamboo, sticks)



The pile tube drive to compact the soil gradually taken out and sand is filled in its place thus forming pile

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ASSIGNMENT - III

1. Differentiate b/w English bond & flemish bond

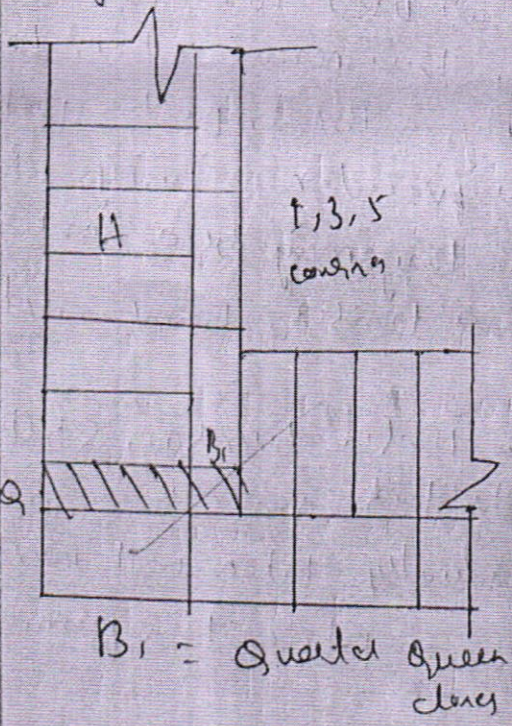
* English bond is much stronger than flemish bond for the walls thicker more than 1½ brick.

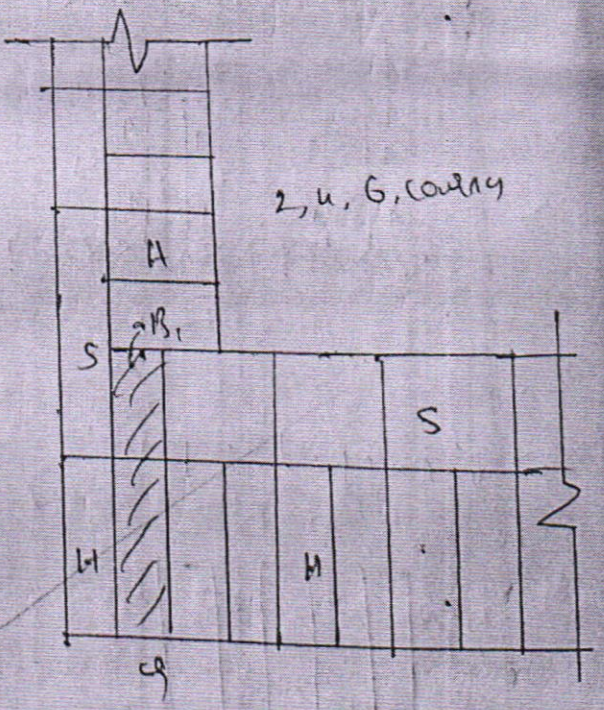
* flemish bond shows more attractive and pleasing appearance of masonry work.

* flemish bond is economical as it uses broken ~~bat~~ brick bats although it requires some extra mortar for additional joints

* Uses of flemish bond is a bit difficult than english bond. flemish bond requires more skilled labour and supervision

2. Sketch the plan of alternative course of 1½ brick thick wall in english bond and mention the special features of English bond





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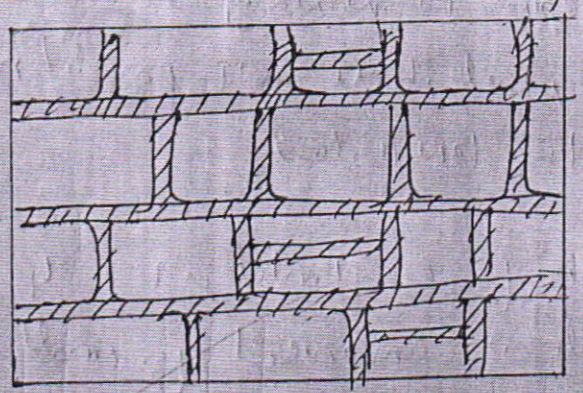
Features of English Bond:

1. Alternative course will show either headers or stretchers in elevation
2. Every alternate header comes centrally over the joints b/w 2 stretches in course below.
3. In the stretcher course, the stretcher have a minimum lap of 1/4th there length over headers.
4. There is no continuous vertical joint
5. Wall of odd multiple of half bricks will show stretchers on one face and headers on the other faces.
6. The hearting of each of the thicker wall consists entirely of headers
7. Atleast every alternate transverse joint is continuous from face to face.

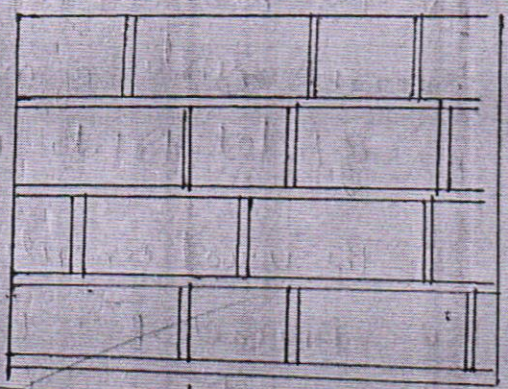
3. Difference b/w random rubble masonry & coursed rubble masonry with a sketch.

Random rubble masonry



The elevation of this type of masonry shows irregular stones with non uniform joints

Coursed Rubble masonry



The projection of rock faced shall not exceed 30mm beyond the side or bed joint

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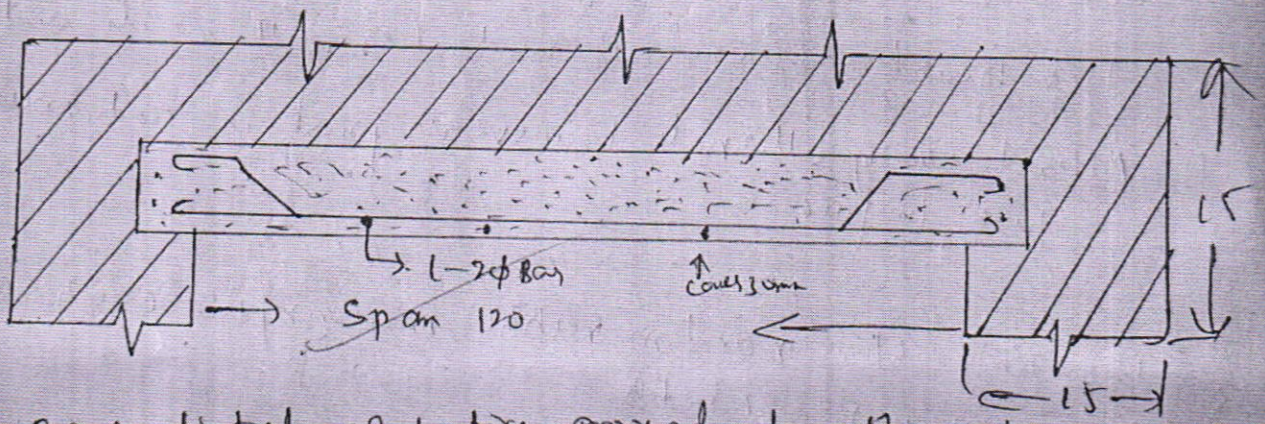
* At least ¼ of the face stone should fall back into the hearting for proper strength
* The joints should not exceed 13 mm

* At least ⅓ of the face stone should fall back into the hearting for a proper strength.
* The joints should not exceed 10 mm

4) Explain with a neat sketch the following types of lintels.
(i) RCC lintels. (ii) Stone lintels

RCC lintels:-



* RCC lintels are fire proofed, durable, strong, economical and easy to construct
* Its width is kept equal to width of the wall
* It consists of mild steel bars, are provided near the bottom of lintel to take up the tensile load
* The usual concrete mix for RCC lintels is 1:2:4.
* Precast RCC lintels are convenient for small spans upto
* For cast-in-situ, units, which are quite common for work in prepared reinforcement is placed

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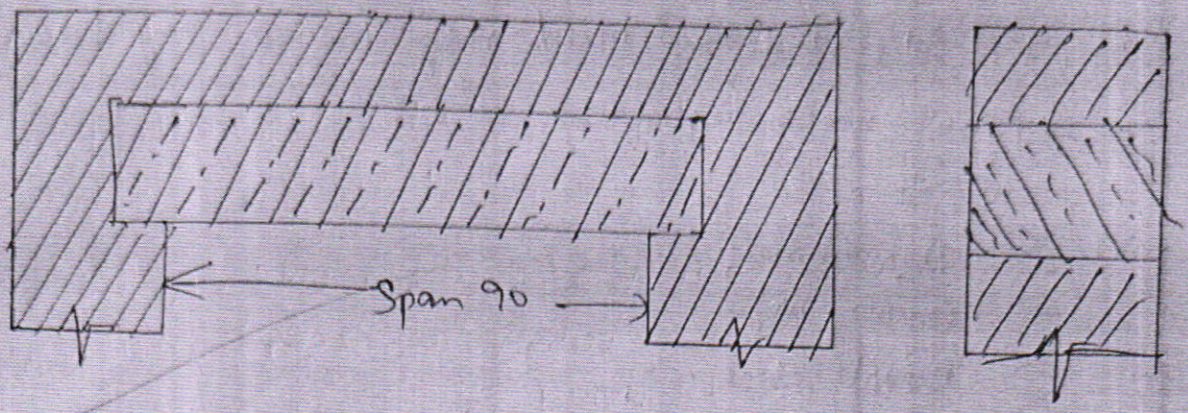
Stone Lintel:



In places where stone is easily and abundantly available stone lintels are mostly used. These lintels are quite cheap and strong. But they cannot be used over large spans as stone is very weak in tension stone lintels can be used upto spans of 2m, if good quality stone is available.

5. What are the general principles to be observed in stone masonry construction.

- Stone used in a good masonry should be well seasoned hard, tough and uniform texture
- Proper bond should be maintained throughout the masonry
- Toothing should not be allowed in stone masonry
- The vertical joints should be staggered as far as possible.
- The masonry should not be subjected to tensile stresses.
- The exposed joints in stone masonry should be properly point

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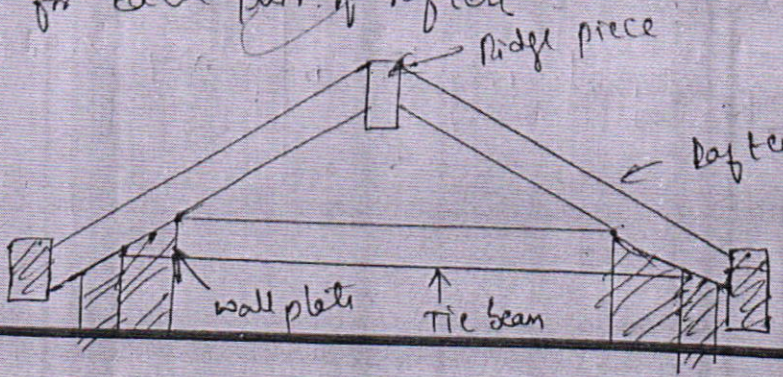
ASSIGNMENT - 1

1. Mention the types of sloped roof. Explain any two

Types of sloped roofs

- Single roof
  - → Lean to roof
  - → Couple roof
  - → Couple close roof
  - → Collar beam roof or collar roof
- Double or purlin roof
- Triple membered or trussed roof
  - → King post roof
  - → Queen post roof
  - → Steel sloping roof
- Composite roof trees
- Truncated roof tree.

1. Couple close roof: This roof is similar to the couple roof except that the ends of the couple of common rafters is connected by horizontal members called tie beam. The tie beam may be a wooden member or a steel rod. There is one tie beam for each pair of rafters



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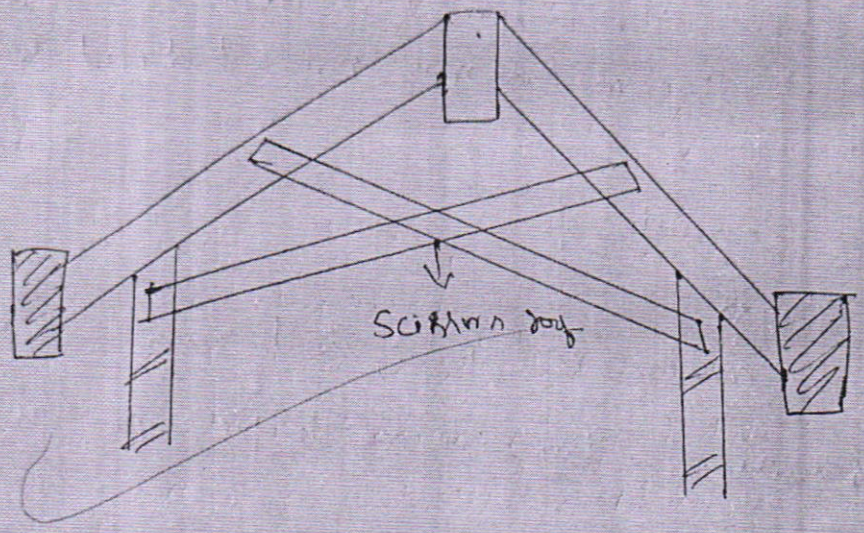
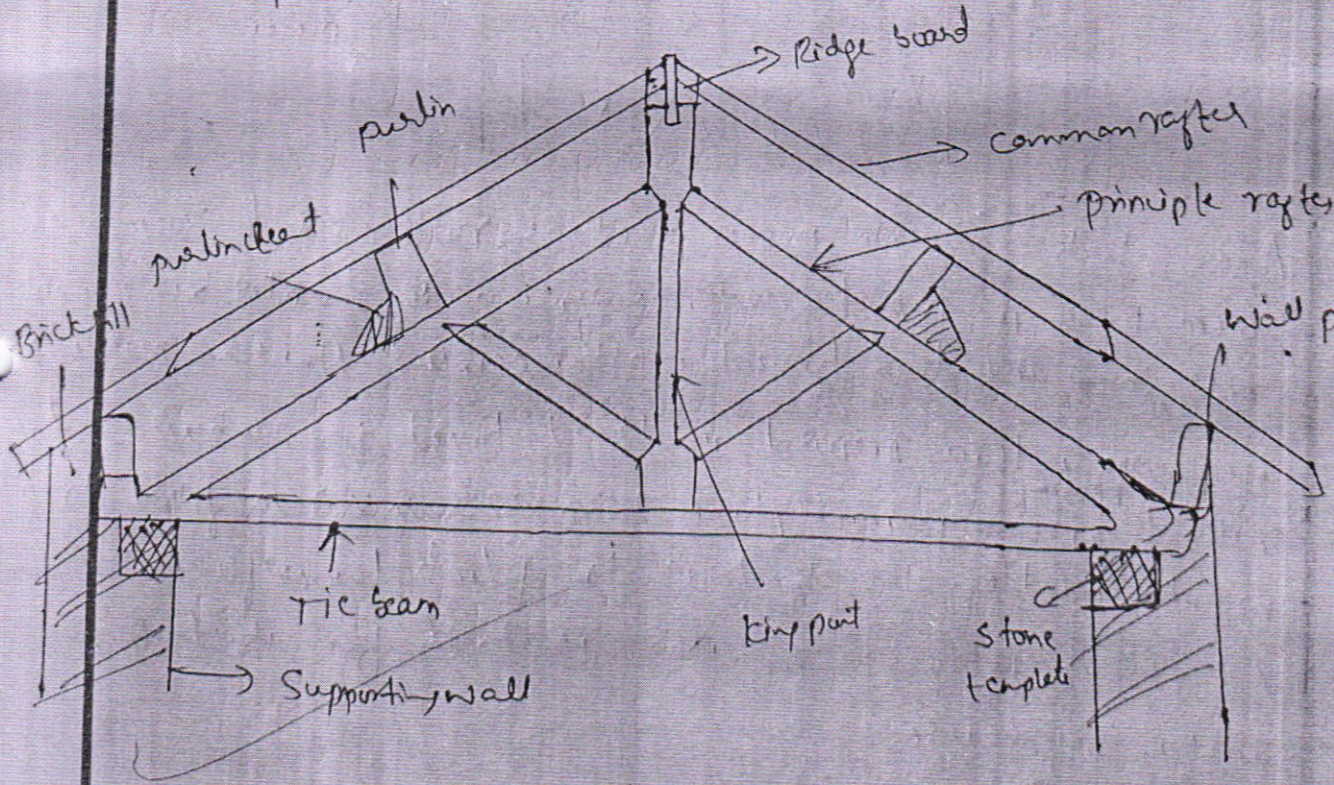
2 collar and scissor's roof: This roof is similar to the collar beam roof except that two collar beam which are crossing each other to present an appearance of scissors are provided as shown in fig



2) Draw the sketch of king post wooden roof truss (half) and mention its parts.



King post Roof Truss

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3. Explain construction of Mosaic flooring with sketch

For the construction of a mosaic flooring, a concrete base is prepared and over it lime surkhi mortar is spread to a depth of 5 to 8 cm and levelled.

The area over which this is spread is restricted to a suitable working period so that the mortar may not get dried before the floor is finished.

Mosaic flooring consists of

* Concrete layer
* A layer of cementing material of about 3mm thick.
* After 6 hours, the laying of marble pieces or tiles is started

After starting marble pieces a stone roller about 30cm dia, 45cm long is passed over the surface gently, water being sprinkled over now and then to work up the cement below the marble pieces.

The surface thus prepared is allowed to set for 24 hours and is rubbed with a pumice stone 20cm x 12.5cm x 7cm fitted to a long wooden handle. The object is to polish the surface and to make it smooth and level. The floor is dried for about two weeks before use.

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4) Differentiate b/w bay window and corner window

Bay window: Bay window project outside the external walls of the room. This projection may be triangular, circular, rectangular and polygonal in plan.

Such an window provides an increased area of opening for admitting greater light and air. They also provide extra space in the room and improve the overall appearance of the building.

Corner window: This is a special type of window which is provided in the corner of a room. This window has 2 faces in 2 perpendicular directions. Due to this, light and air is admitted from two directions. Such a window very much improves the elevation of the building. The jamb part of the window at the corner is made of heavy section.

5. What is shoring? Briefly explain raking shore with a sketch

Shoring is the construction of a temporary structure temporarily an unsafe structure. These provide lateral support to the walls. Some of the circumstance under which the shoring is required as follows

#1. When the cracks developed

#2. Wall shows signs of bulging out due to the bad workmanship

#3. When the adjacent structure is to be dismantled

Raking Shore: Raking shores is a system of giving temporary support to an unsafe wall. It is also called an inclined shore.

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Defects in plastering:-

1. Blistering plastered surface:- The small patches swell out beyond the plane of the plastered surface and this defect is particularly seen in case of plastered surface inside the building.

2. Cracks:- There are formed on the plastered surface and may be hair cracks or cracks which may be easily seen.

3. Uneven surface:- The defect becomes prominent only due to poor workmanship of the work.

4. Softness:- The excessive dampness at certain points on the plastered surface make that portions soft.

5. Rust-stains:- These are sometimes seen on the plastered surface, especially when the plaster is applied on the metal lath.

6. Flaking:- The formation of a very small loose mass on the plastered surface is known as the flaking and it is mainly due to bond failure of successive coats of plaster.

8 Explain the constituents of oil bound paint.

1. Base:- It provides body to the paint and on it depends the nature of paints to a great extent. It forms a opaque layer to obscure the surface of materials to be painted, it makes the paint film harder and more resistant to abrasion.

2. Vehicle:- It is an oily liquid in which base and pigment are soluble. It facilitates the paint to be conveniently spread evenly

over the surface by means of brush, it acts as a binder for the base and cause it to stick to the surface

4. Coloring pigments: Their main function is to give colour and opacity to the paint pigments are liable to fade because of the bleaching action of sun rays

5. Thinners: A liquid thinner is added to the prepared paint to increase their fluidity to the desired consistency so as to make them work smoothly and also to help penetration of porous surface

5. Driers: Driers are added to paint to quicken the drying of vehicle linseed oil dries by absorbing oxygen

6. Extenders: It is an adulterant mixed to replace the base part and thus reduce the cost of paint.

9. Explain the procedure of painting to
(i) New plastered surface
(ii) New wood surface

New plastered surface:

* It may contain considerable moisture. Hence painting should be resorted to only after 3 to 6 month of plastering
* To prevent from alkali attack alkali resistant primer is used
* Absorption of liquid from a paint by a porous surface is known as suction.
* If the section is so high a variable that normal painting procedure

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by capillary action. Thus the dampness finds it way to the floor through the substructure.

2. Action of rain:

If the faces of wall, exposed to heavy showers of rain, are not suitably protected, they become the source of entry of dampness in it.

3. Rain beating against external wall:

If balconies and chajja projections do not have proper outward slope, water will accumulate on them and could ultimately enter the walls through their junction.

4. Condensation: The process of condensation takes place when humid air is cooled. Due to condensation of atmospheric moisture, water is deposited on the walls, floors and ceilings. This moisture may cause dampness.

Remedies: Use of membrane damp roof
Use of Integral damp roof
Use of Surface treatment
Use of Painting

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