Muskan Garg
2018UCE132
C3

Page No.
Date

BD Assignment -3

Roofs

(a) What are the merits and demerits of flat roof over pitched roofs?

Ans (i) Flat roof area can be used for roof gardening, drying yards, playing etc.
(ii) Its construction is easy and simple.
(iii) It is easier to make flat roof fireproof.
(iv) A flat roof is more stable against high winds.
(v) For multi-storied building, a flat roof is only choice.
(vi) It has better insulating properties.
(vii) It does not require a false ceiling which is desirable in case of pitched roof.
(viii) It is found to be overall economical than a pitched roof.

Demerits of flat roofs over pitched roofs.

1.) A flat roof can't be used over a large span.
2.) Flat roofs are costlier than sloped roofs.
3.) Cracks are developed on the surface of the roof when the variation in high temp.
4.) In regions of heavy rainfall, flat roofs are not preferred.
5.) If top surface slop is not sufficient, water pocket may be formed on the surface of the roof. This mainly lead to leakage of roofs.
6.) Self-weight of that roof is quite high. This reduce the superimposed load-carrying capacity of roof.
7.) The progress of construction of that flat roof is slow as compressed to pitched roof.

(b) Write procedure to construct (with help of sketch) a flat RCC roof for a hall in a residential building.

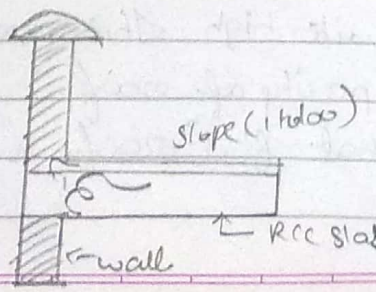
(i) Prepare the framework in accordance with IS: 14687 (1999). This will provide support to wet concrete till it become self supporting. All framework surface in contact with concrete need to be treated with concrete shuttering oil, prior concrete placement check, level of the prepared surface.

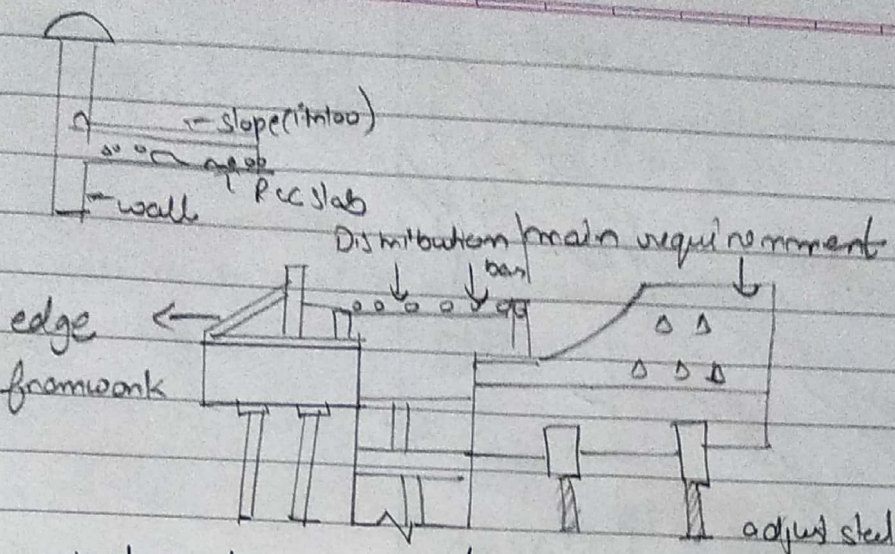
(ii) Prepare and place the reinforcement as per design drawings. Examine reinforcement spacing and cover. The concrete cover and spacing and fix supporter. The end of binding wires shall be bind inwards.

(iii) Begin pouring the concrete. Mixing, transporting and handling of concrete shall be properly coordinated with placing and finished works. Concrete should be deposite out as at or as close as possible to its final location in order to prevent segregation. The mix should be mechanically mix and vibrated after laying on the slab.

(iv) Lastly, slabs could be finished using power float. After finishing initial, suitable technique shall be used to cure the concrete slab curing method such as water cure, concrete is flooded, ponded or mist sprayed.

(v) After this a protective layer consisting of 10 cm thick layer of the concrete draining with some water proofing is provided over the RCC slop slab. This layer make the roof leak proof.





(c) What are the merit of steel truss over wooden truss?

And advantage of steel truss over timber truss are –

(i) Steel trusses are stronger than timber trusses.

(ii) Steel section forming the truss are light in weight and can be fabricated in any desired pattern to suit the architectural requirement.

(iii) There is no danger of ~~ma~~ timber being eaten by termites or either insects.

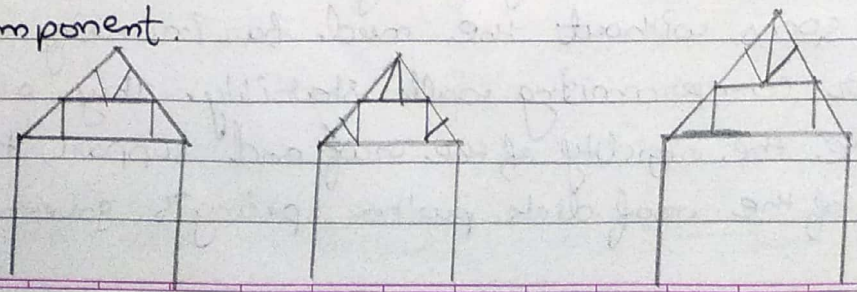
(iv) Steel trusses are mark fine - resistance than timber trusses.

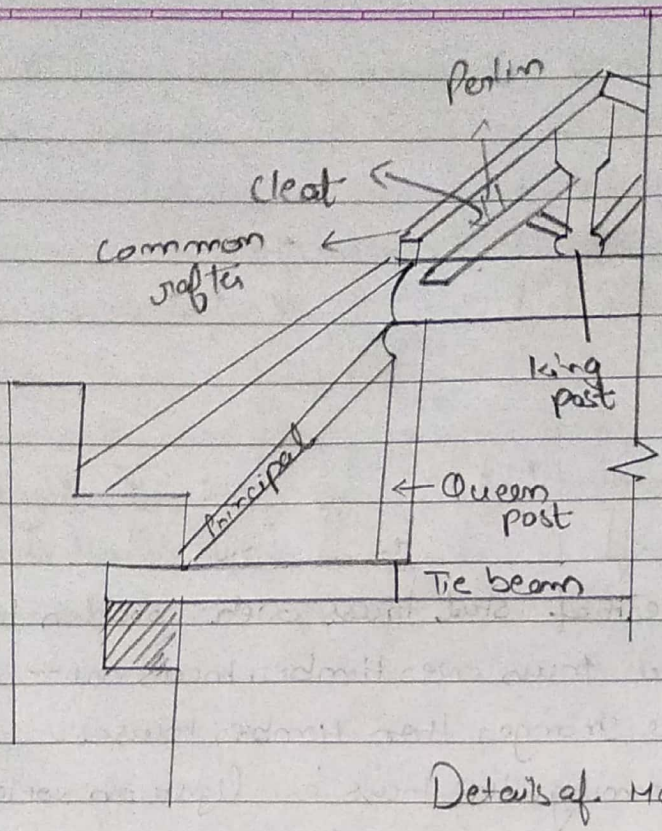
(v) They don't have span restriction and as such steel trusses can be used for industrial building and other structures where large areas are required to be covered without obstruction due to columns etc.

(vi) The sections forming steel truss are easy to transport.

(vii) The section can be obtain in any desired form or ~~or~~ length to suit the requirement and there is not much wastage of material in cutting

(d) Draw a neat sketch of Mansard roof truss, showing all component.





Details of Mousard Truss

(e) What is the difference b/w common rafter and principal rafter?

Ans Inclined member of a truss are known as principal rafter. They are usually the largest type of rafter located at the end of a roof structure. Common rafter are intermediate rafter which give support to the roof covering. They are smaller rafter located in b/w the principal at both end.

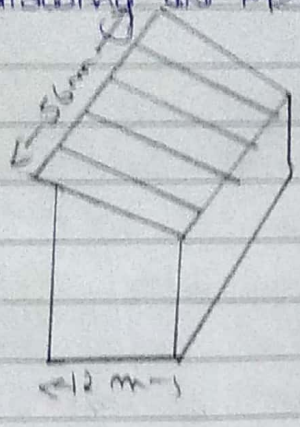
(f) What is function of purlin? How the spacing of purlins is decided?

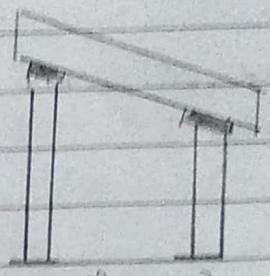
Ans Purlins function as form of support for rafter and are horizontal structural members in a building, architecture or structural engineering. They are used to increase roof spans without the need for increasing rafter size or compromising wall stability. They also increase the rigidity of the roof and support the overall weight of the roof deck purlin spacing is governed by the

spacing of truss, snow load on purlin dividing of basket and type of roofing material applied.

(9) what are possible configuration of proposed pitched roof for a hole of 12m x 36m size? Draw sketches.

Ans following are the possible configurations -

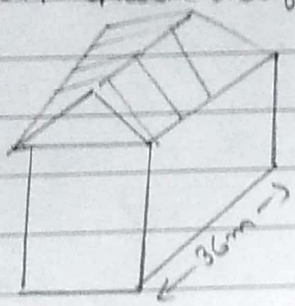


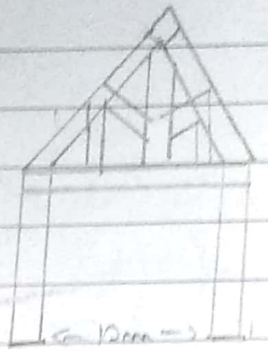


elevation

shed roof.

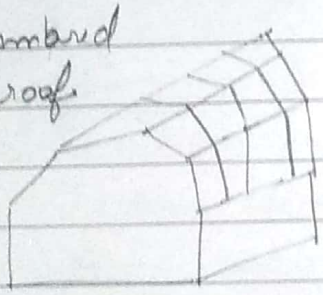
Open Gable roof.

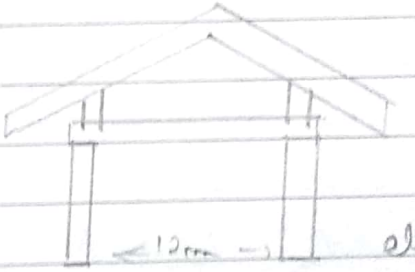




Elevation

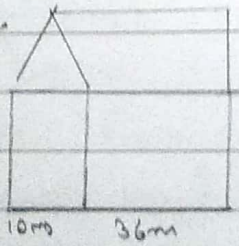
Combined roof.

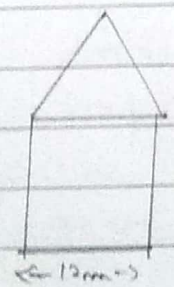


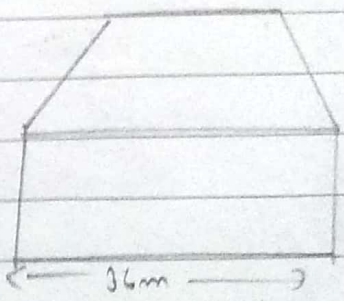


elevation

Hip roof.







Elevation