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Seventh Semester B.E. Degree Examination, June/July 2023

Masonry Structures

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of IS-1905-1987 is permitted.

Module-1

- 1 a. Explain about strength parameters for stone and block masonry unit. (10 Marks)
- b. What are defects and errors in masonry construction? Explain in detail. (10 Marks)

OR

- 2 a. What are the requirements for a good mortar used in masonry construction? (10 Marks)
- b. With a neat sketch, explain determination of compressive strength of masonry based on elastic theory. (10 Marks)

Module-2

- 3 a. Write a note on :

(i) Permissible compressive stress

(iii) Shape reduction factors

(ii) Stress reduction factor

(iv) Area reduction factor
- b. Explain design criteria for solid walls. (10 Marks)

OR

- 4 a. With the suitable values, explain the following according IS codal recommendations:

(i) Effective height of wall.

(iii) Effective thickness of wall

(ii) Effective length of wall

(iv) Slenderness ratio
- b. Explain design consideration for cavity walls. (10 Marks)

Module-3

- 5 a. What is equivalent eccentricity? Explain stress distribution with neat sketches for a wall subjected to eccentricity loading when eccentricity $e = 0$, $e \leq \frac{t}{6}$, $e = \frac{t}{6}$ and $e > \frac{t}{6}$. (10 Marks)
- b. List the steps involved in the design of axially loaded walls without eccentricity. (10 Marks)

OR

- 6 Design an interior cavity wall with cross-walls for a three storeyed building, the ceiling height of each storey being 3 m. The wall is stiffened by intersecting walls 200 mm thick at 3600 mm centre to centre.
 Assume loading from roof = 16 kN/m and from each floor = 12.5 kN/m.

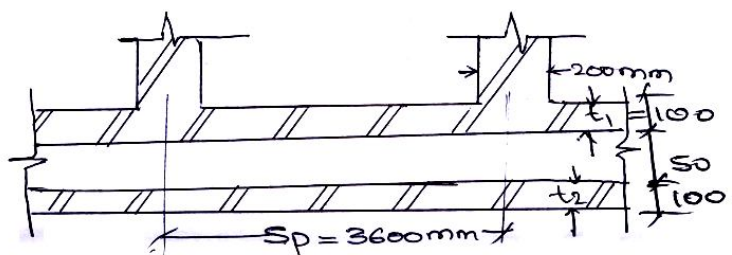


Fig. Q6
1 of 2

(20 Marks)

Module-4

- 7 a. Design an interior wall of a two storeyed building carrying concrete slabs with a storey height 3 m. The wall is stiffened by 230 mm thick intersecting wall at 3600 mm C/C. The wall has a door opening of size 900×2100 mm at a distance of 200 mm from one of the intersecting walls.
- (i) Roof loading = 15 kN/m
(ii) Floor loading = 12.5 kN/m (10 Marks)
- b. Explain the design criteria of walls subjected to concentrated load including walls with piers. (10 Marks)

OR

- 8 Design an interior wall of a three storeyed building carrying eccentric load due to unequal short spans of roof/floor of 4 m and 3 m on either side of the wall. The height of each storey is 3 m. Assume the intensity of loading as follows :
- (i) From roof = 6 kN/m^2
(ii) From floor = 4 kN/m^2 (20 Marks)

Module-5

- 9 a. What is reinforced brick masonry? Explain the advantages of reinforced brick masonry. (10 Marks)
- b. With neat sketches, explain the modes of failure in infilled frames. (10 Marks)
- OR**
- 10 a. What is shear wall? Explain modes of failure in shear wall. (10 Marks)
- b. Explain the design criteria of walls subjected to transverse loading. (10 Marks)

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