USN ☐☐ ☐☐☐☐☐☐☐

18CV735

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   (ii) Stress reduction factor
   (iii) Shape reduction factors   (iv) Area reduction factor **(10 Marks)**
   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.   (ii)   Effective length of wall
   (iii) Effective thickness of wall   (iv)   Slenderness ratio **(10 Marks)**
   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 $e = 0$, $e \leq \dfrac{t}{6}$, $e = \dfrac{t}{6}$ and $e > \dfrac{t}{6}$. **(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.
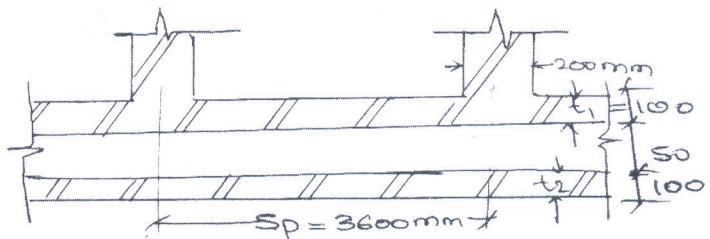

Fig. Q6

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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