

--	--	--	--	--	--	--	--	--	--

## 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  $e = 0$ ,  $e \leq \frac{t}{6}$ ,  $e = \frac{t}{6}$  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.

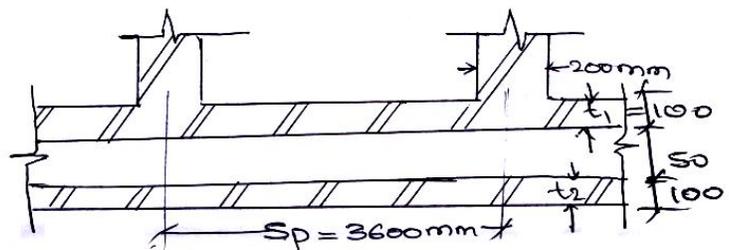


Fig. Q6  
1 of 2

(20 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

**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<sup>2</sup>
  - (ii) From floor = 4 kN/m<sup>2</sup>
- (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)

\* \* \* \* \*