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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Civil Engineering

Semester End Examination; May / June - 2018

Design of Masonry Structures

Time: 3 hrs *Max. Marks: 100*

***Note**: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

ii) Use of IS 1905-1987 is permitted.

UNIT - I

1 a. What is mortar? Give the various classification of mortar based on proportion, material and strength. 10

b. Discuss the masonry characteristics of bricks and blocks. 10

2 a. Write in detail, various factors affecting the compressive strength of masonry. 10

b. Write in detail, various properties and requirements of a good mortar. 10

UNIT - II

3. Discuss the effect of rate of absorption, effect of curing and effect of aging on masonry work strength. 20

4. Write the mechanism of failure for masonry subjected to direct compression. 20

UNIT - III

5 a. Define the following terms and give IS recommendations :

i) Effective height of wall

ii) Effective length of wall 10

b. What is equivalent eccentricity? With neat sketches, explain stress distribution for a wall subjected to eccentricity loading, when eccentricity,

$e = 0, e < \frac{t}{6}, \quad e = \frac{t}{6}$ and $e > \frac{t}{6}$ 10

6 a. Explain the following terms :

i) Permissible compression stress

ii) Stress reduction factor

iii) Shape reduction factor 10

b. Discuss the permissible tensile stresses and compressive stresses for an eccentrically loaded wall. 10

UNIT - IV

7 a. Explain the steps involved in consideration of loads and design of masonry wall with openings. 10

b. Define the following terms and give IS recommendations :

i) Eccentricity ratio

ii) Slenderness ratio 10

Contd…2

8. Design an axially loaded unstiffened, solid interior cross wall of a two storyed building to carry 100 mm thick RCC slabs with 3 m ceiling height. The wall supports a 2.65 m wide slab. Live load on roof = 1.5 kN/ m^2, live load on floor = 2 kN/ m^2, weight of 80 mm thick terrace = 1.96 kN/ m^2 and weight of floor finish = 0.2 kN/ m^2. 20

UNIT - V

9 a. With neat sketches, explain modes of failure of an in filled frame. 10

b. Write a short note on reinforced masonry construction. What are its advantages? 10

10. Design an exterior wall of a single story warehouse of 3.5 m height. The loading on the wall consists of vertical load of 25 kN/m from the roof and wind pressure of 860 N/ m^2. The wall is tied with metal anchor at the floor and roof levels. 20

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