CBCS SCHEME

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18CV735

Seventh Semester B.E. Degree Examination, Jan./Feb. 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. With neat sketch, explain causes and remedial measures for cracks in masonary. **(10 Marks)**

b. Briefly explain the various defects and errors in masonary construction. **(10 Marks)**

OR

2 a. Explain in details the properties of mortar. **(05 Marks)**

b. Briefly explain the factors effecting compressive strength of masonary. **(08 Marks)**

c. List out the test on Bricks and explain. **(07 Marks)**

Module-2

3 a. An interior cross wall of a two storied building is 100mm thick with a ceiling height 3m. The wall is constructed with brick of compressive stress 10N/mm^2 and M_1 type of mortar. The walls are fully restrained at top and bottom. Determine:

i) Effective thickness
ii) Effective height
iii) Slenderness ratio
iv) Stress reduction factor assuming 0 eccentricity
v) Permissible compressive stress. **(10 Marks)**

b. Explain area reduction factor, effective length, slenderness ratio, effective height. **(10 Marks)**

OR

4 a. Explain the effects of eccentricity, load dispersion and arching action in masonary. **(10 Marks)**

b. Explain briefly stress reduction factor, shape modification factor, increase in permissible stress for eccentricity. **(10 Marks)**

Module-3

5 a. Design an interior cross wall of a two storeyed building to carry 100mm thick RCC slabs with 3m ceiling height. The wall is unstiffened and it supports a 2.65m wide slab.
LL on roof = 1.5kN/m^2
LL on floor = 2kN/m^2
Weight of 80mm thick terrace = 1.96kN/m^2
Weight of floor finish = 0.8kN/m^2
f_{ck} = 0.96N/mm^2
Wall thickness = 100mm
Crushing strength of brick = 10N/mm^2
M_1 type mortar. **(10 Marks)**

b. Explain design criteria of masonary wall subjected to UDL. **(10 Marks)**

OR

6 a. Explain with neat sketch:
   i) Cavity wall
   ii) Faced wall
   iii) Curtain wall
   iv) Shear wall
   v) Solid wall with piers. **(10 Marks)**

b. Design an interior wall of three storeyed building – the ceiling height of each story being 3m. The wall is stiffened by intersecting wall 200mm thick at 3600mm c/c. Take load from roof = 16kN/m, load from each floor = 12.5kN/m. Refer Fig.Q.6(b). **(10 Marks)**

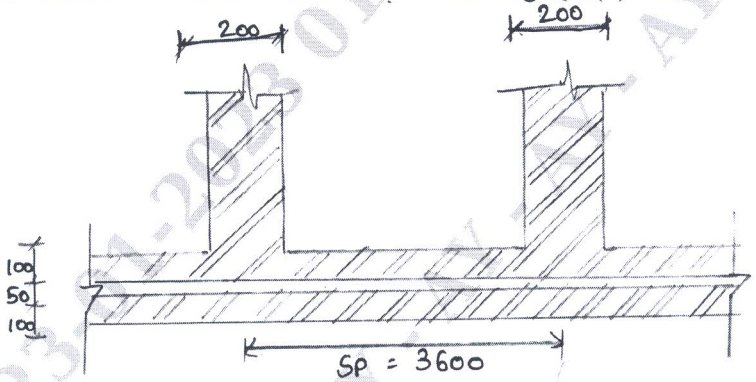

Fig.Q.6(b)

Module-4

7 a. Explain the design criteria for an eccentricity loaded wall. **(10 Marks)**

b. Design an exterior wall of a workshop building 3.6m high carrying steel trusses at the top at 4.5m spacing. The wall is securely tied at the roof and floor level. The loading shall be assumed as follows:
   i) Concentrated reaction from roof truss = 30kN
   ii) Roof loading = 7 kN/m
   Refer Fig.Q.7(b) **(10 Marks)**

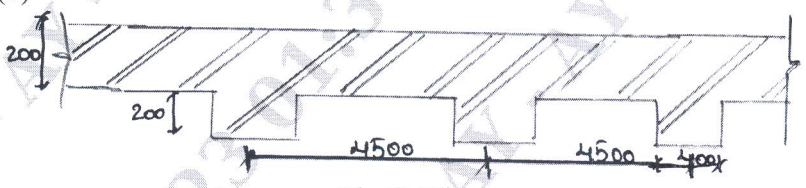

Fig.Q.7(b)

OR

8 a. Design an interior wall of a two storeyed wall carrying concrete slab with a story height of 3m. The wall is stiffened by 100mm thick intersecting walls at 3600mm c/c. Also, the wall has a door opening of size 900 × 2000mm at a distance of 200mm from one of the intersecting wall. Take i) Roof loading = 15kN/m ii) Floor loading = 12.5kN/m. **(10 Marks)**

b. What is equivalent eccentricity? Explain stress distribution under eccentric load with sketch. **(10 Marks)**

Module-5

9 a. Discuss the design principles of wall subjected to transverse load. **(10 Marks)**

b. Design an exterior wall of a single storey warehouse of 3.5m height. The loading on the wall consists of vertical load of 25kN/m from the roof and wind pressure of 860N/m^2. The wall is tied with metal anchor at the floor and roof level. **(10 Marks)**

OR

10 a. What are infilled frames? Explain different modes of failure infill frames with sketch. **(08 Marks)**

b. Design a compound wall the height of which is 1.8m up to the top of coping (Fig.Q.10(b)). Assume wind pressure is equal to 1000N/m^2 and is uniformly distributed. SBC = 120kN/m^2. **(12 Marks)**

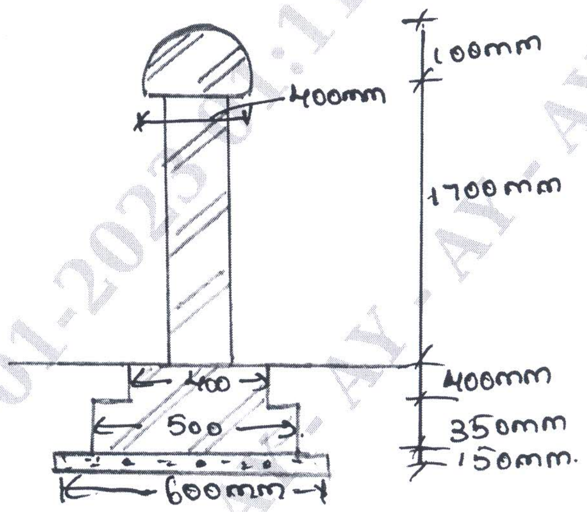

Fig.Q.10(b)

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