B.Arch. Sixth Semester (Architecture Engineering) (CGS)

10049 : Architectural Structure - V : 06 AR 03

P. Pages : 2 | AU - 2831

Time : Three Hours | Max. Marks : 80

Notes :
1. Answer **Three** question from Section A and **Three** question from Section B.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Illustrate your answer necessary with the help of neat sketches.
5. I.S.I. Hand book for structural Steel section, I.S. Code 800/1962 or 1964, I.S. 456 (Revised) I.S. 875 may be consulted.
6. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION – A

1. Compare precast concrete with cast in-situ concrete. 13

OR

2. What is precast concrete. How the manufacturing of various precast units is carried out. 13

3. Write short note on :- 13
Application of thumb rules for beams, column, slab for fixing sectional properties.

OR

4. a) State the rules for maximum & minimum reinforcement in slab. 7

b) State the rules for effective span of beam & slab. 6

5. Design a circular water tank resting on a ground & having a flexible base at the bottom for the following data :- 14
   a) Capacity of tank = 250000 liters
   b) Concrete :- M20 grade
   c) Steel :- Fe250
   d) $\sigma_{cbc} = 7$ N/mm^2
   e) $\sigma_{ct} = 1.2$ N/mm^2
   f) m – 13.33
   g) $\sigma_{st} = 100$ N/mm^2

OR

6. Design a circular water tank of capacity 4.5 lakhs liters of water. The height of water tank is restricted to 5m. Use M20 grade of concrete [m = 18.66]. 14

SECTION – B

7. a) Discuss the advantages & disadvantages of welded connection over a riveted connection. 6

b) Explain with Neat sketches The different types of riveted & welded joints. 7

OR

8. Explain with neat sketches different types of failure in riveted joint. **13**

9. A tie member 80 mm x 8 mm is used to transmit a load of 120 kN. Design a fillet weld & calculate necessary overlap if it is welded on : **14**
   i) Two sides ii) Three sides iii) Four sides.

OR

10. Two plates 12 mm thick are connected by a double riveted double cover butt joint, using 18 mm dia. rivets at a pitch of 8 cm. If the ultimate tensile stress in plate & shearing & bearing stresses in the rivets are 460 N/mm^2, 320 N/mm^2 & 640 N/mm^2 respectively. Find the pull per pitch length at which joint will fail & the efficiency of the joint. **14**

11. Calculate the strength of discontinuous strut of length 3.2m. The strut consist of two unequal angles 100 x 75 x 8 mm [f_y = 250 N/mm^2] with long legs connected & placed on opposite side of a gusset plate. The strut is tack bolted & is connected to 10 mm gusset plate. **13**

OR

12. A tie member in a bracing system consist of two Angles 150 x 115 x 10 mm [f_y = 250 MPa] with long legs connected to a gusset plate by 18 mm dia. rivets in such way that the angle section is reduced in a section by one rivet hole only. Determine the tensile strength of a member if :- **13**
   a) The Angles are connected on same side of gusset plate 12 mm thick & are tack riveted.
   b) The Angles are connected on the opposite side of gusset plate 12 mm thick & are tack riveted.

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