

B.Arch. Seventh Semester (Architecture Engineering) (CGS)
10061 : Architectural Structure - VI : 7 AR 05

P. Pages : 2

Time : Three Hours



AU - 2966

Max. Marks : 80

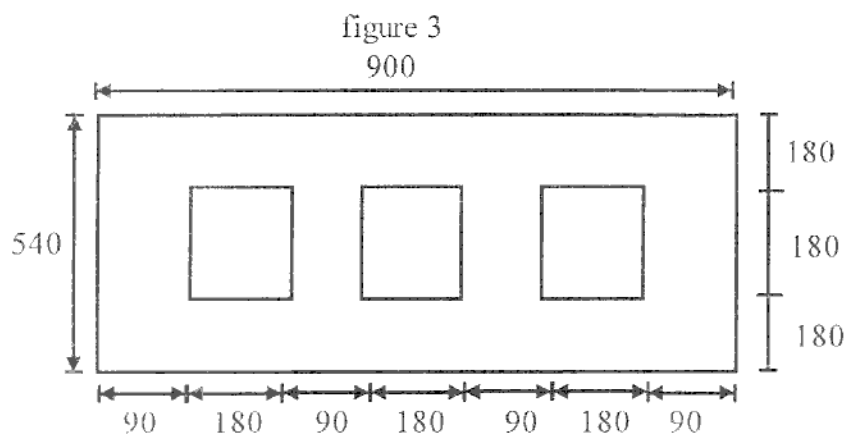
- Notes :
1. Question No. 3 & 10 from Section A and B are compulsory.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answer necessary with the help of neat sketches.
 5. I.S.I. Hand book for structural Steel section, 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. Design a reinforced concrete slab for a room of clear dimension $4\text{m} \times 5\text{m}$. The slab is supported on walls of width 300 mm. The slab is carrying a live load of $4\text{kN}/\text{m}^2$ & floor finish of $1\text{kN}/\text{m}^2$. Use M20 concrete & Fe415 steel. The corners of slab are held down. 14

OR

2. Design a rectangular column footing with the following data. 14
 - a) Column size = $300\text{mm} \times 400\text{mm}$
 - b) Load on column = 1400 kN
 - c) Safe Bearing Capacity of Soil = $200 \frac{\text{kN}}{\text{m}^2}$
 - d) Use M20 concrete & Fe415 Steel.
3. Figure (3) shows the cross-section of a masonry chimney with three flues. If wind pressure of $1400\text{N}/\text{m}^2$ acts normal to the longer side. Calculate stresses on the windward & Leeward sides given that the height of the chimney is 1 m & the weight of the masonry is $19200\text{N}/\text{m}^3$. 13



4. Explain in short "The eccentrically loaded footing" & the selection criteria for eccentrically loaded footing. 13

OR

5. Explain the term 'Flat Slab' & the terms associated with flat slab. 13

SECTION - B

6. Discuss in short about repair and rehabilitation of structure. 13

OR

7. State the different types of Non-destructive techniques used in construction. 13

8. A double riveted double cover Gutt joint is used for connecting a plates 1.2 cm thick. The diameter of rivets is 2.2 cm. The permissible stresses are 100 N/mm^2 in tension, 80 N/mm^2 in shear & 160 N/mm^2 in bearing. Calculate necessary pitch & efficiency of joint. 13

OR

9. Two plates 10 mm thick are jointed by single rivetted lap joint. The diameter of rivet is 16 mm & pitch is 40 mm. If allowable tensile stress is 120 N/mm^2 , allowable shear stress for rivet is $100 \frac{\text{N}}{\text{mm}^2}$, allowable crushing stress in rivet is 160 N/mm^2 . Determine the efficiency of the Lap Joint. 13

10. A tie member in a basin system consist of two angles $150 \times 115 \times 10 \text{ mm}$ [$f_y = 250 \text{ MPa}$] with long leg connected to the gusset plate by 18 mm diameter rivet. Determine the tensile strength of the member if
i) The angle are connected on the same side of the guesset plate 12 mm thick and tack rivetted.
ii) The angle are connected on the opposite side of guesset plate and tack rivetted. 14
