

Printed Pages : 3



AR403

(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 181405**

Roll No.

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**B. Arch.**

(SEM. IV) THEORY EXAMINATION, 2014-15

**ARCHITECTURAL STRUCTURES - IV**

Time : 3 Hours]

[Total Marks : 50

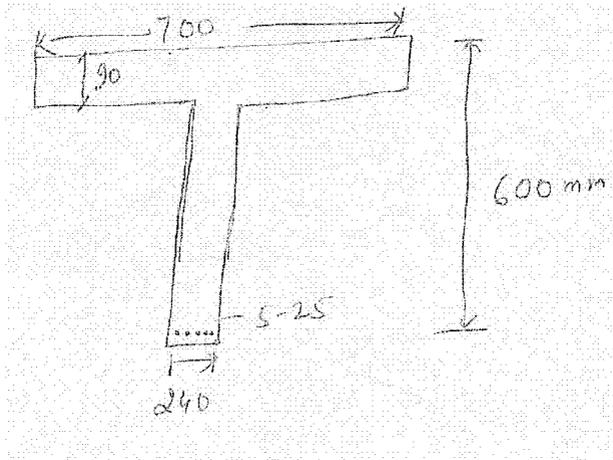
Note : Attempt all questions.

1 Answer any one :

- (a) A beam simply supported over an effective span of 7m carries a live load of 20 kN/m. Design the beam, using M20 concrete and HYSD bars of grade Fe415. Keep the width equal to half the effective depth. Assume unit weight of concrete as 25 kN/m<sup>3</sup>.
- (b) A reinforced concrete beam has width equal to 300 mm and total depth of 700 mm with a cover of 40 mm to the centre of reinforcement. Design the beam if it is subjected to a total bending moment of 150 kN-m. Use M20 concrete and HYSD bar of grade 415.

2 Answer any one :

- (a) Determine the M.R. of T-beam shown in figure. Use M15 concrete and Fe415 steel.



**Fig. 1**

- (b) Find the M.R. of T-beam if the beam has following data.

$$b_f = 800 \text{ mm}, d = 430 \text{ mm}, b_w = 270 \text{ mm}$$

$$A_{st} = 6-20 \text{ mm } \phi \text{ mild steel bars.}$$

$$D_f = 100 \text{ mm M15 concrete}$$

3 Answer any one :

- (a) Write down the design procedure of a two-way slab. 10

- (b) Write short notes on : 10
- (i) Workability
  - (ii) Anchorage bond
  - (iii) Development length
  - (iv) Aggregate
  - (v) Grade of concrete.
- 4 Answer any one : 10
- (a) Design an isolated footing for a column  $500 \text{ mm} \times 500 \text{ mm}$  transmitting an axial load of 1200 kN. The column is reinforced with 8 bars of 20 mm diameter. The safe bearing capacity of soil is 120 tonnes/m<sup>2</sup>. Use M20 concrete and Fe415 steel.
  - (b) Write down the design steps for column footing design according to IS code.
- 5 Answer any two :
- (a) What are the requirement of good detailing of reinforcement ?
  - (b) Write short notes on Masonry Wall.
  - (c) Write short notes on Fineness Modulus of aggregate and water cement ratio.
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