

**GANPAT UNIVERSITY**  
**B. Tech.VII Semester Civil Engineering**  
**Regular Examination Nov – Dec 2015**  
**2CI701 Design of Concrete Structures**

Time: 3 Hours

Total Marks: 70

- Instructions: - (1) Answer to the two sections must be written in **separate** answer books.  
 (2) Figures to the **right** indicate **full** marks.  
 (3) Assume suitable data if required.  
 (4) Use **IS codes** which are permitted in **Examination Hall**.

**SECTION- I**

Que. – 1 Attempt the followings:

12

- (A) Which factors to be affected during the preparing a drawing and bending schedule as per SP34?  
 (B) What are the do's details required for general drawing, beam, slab and column as per SP34?  
 (C) What is general detailing required in structural drawing as per SP34?

Que. – 2 A short column of size 300 mm x 400 mm is subjected to factored load of 1500kN and factored moment of 50kNm about the major axis. Assume effective cover 50 mm. Take M20 concrete and Fe415 grade steel. Design the column providing steel on. (a) Two sides (b) Four sides. 12

**OR**

Que. – 2 Determine reinforcement for a column of a braced frame for the following data: Size of column: 400 x 600 mm,  $P_u = 1800$  kN,  $M_{ux} = 110$  kNm,  $M_{uy} = 90$  kNm, Unsupported length of column = 3.5 m and effective cover = 50 mm, Use M20 concrete and Fe 415 steel. 12

Que. – 3 Design a combined footing for two columns loads  $C_1=800$  KN and  $C_2=1100$  KN spaced 3.5m c/c. width of footing is restricted to 2.0m the SBC of soil is  $155\text{kN/m}^2$ . Footing materials are M20 grade concrete and Fe415 steel. Take column size 300mmx300mm. 11

**OR**

Que. – 3 Design a combined footing for two columns loads  $C_1=600$  KN and  $C_2=800$  KN spaced 3m c/c, the SBC of soil is  $155\text{kN/m}^2$ . Footing materials are M20 grade concrete and Fe415 steel. Take column size 400mmx400mm. 11

**SECTION – II**

Que. – 4 A reinforced concrete (single span) T beam bridge is to consist of 5 beams 1.75m apart. The span of the bridge is 12m clear with end bearing of 600mm. The live load on the bridge  $17000\text{N/m}^2$  including impact. The carriageway over the bridge is to be 7m wide with a footpath of 1.5m width on other side. The loading on the footpath may be taken as  $4000\text{N/m}^2$ . Design the T-beam of bridge. Use M20 and Fe415. 12

- Que. – 5 Design and detail internal panel of flat slab without drop and column head. 12  
Height of column = 4.5 m above and below slab  
Live load =  $4\text{ kN/m}^2$   
Size of column =  $300\text{ mm} \times 400\text{ mm}$   
Panel size =  $4\text{ m} \times 5\text{ m}$   
Grades: M20 and Fe415.

OR

- Que. – 5 Design the roof slab of portal frame of 40m long and 12m wide. The spacing between two 12  
portal frames is 4m. The slab is water proofed with tar felt and the supports of the columns are  
hinged. The height of the ceiling from the supports is 3.5m. Use M20 and Fe415.
- Que. – 6 Design the circular water tank for a capacity of 600 kilolitres with fixed base. Use mild steel 11  
bars for reinforcement and M20 grade of concrete. Draw reinforcement detailing. Take  $\alpha=0.6$ .

OR

- Que. – 6 Design a circular water tank for the following requirements: 11  
Diameter of tank = 6m  
Depth of water = 3.75m  
Tank rests on ground and the walls & the base slab are flexible.  
Use M20 & Fe415.  
Draw reinforcement detailing.

END OF PAPER

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