

**GANPAT UNIVERSITY****B. Tech. VII Semester Civil Engineering****Regular Examination November – December 2014****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** 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 =  $3.5\text{kN/m}^2$   
 Size of column =  $400\text{mm} \times 400\text{mm}$   
 Panel size =  $5\text{m} \times 5\text{m}$   
 Grades: M20 and Fe415.

**OR**

- Que. – 1** A reinforced concrete (single span) T beam bridge is to consist of 5 beams 1.5m apart. The span of the bridge is 10m clear with end bearing of 500mm. The live load on the bridge  $15\text{kN/m}^2$  including impact. The carriageway over the bridge is to be 6m wide with a footpath of 1.5m width on other side. The loading on the footpath may be taken as  $4\text{kN/m}^2$ . Design the bridge. Use M20 and Fe415. **12**
- Que. – 2** Find final moment of portal frame of 36m long and 12m wide. The spacing between two portal frames is 3m. 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. **11**

**OR**

- Que. – 2** Design a combined footing for two columns loads 1000kN and 1500kN spaced 4m c/c, width of footing is restricted to 1.5m, the SBC of soil is  $280\text{kN/m}^2$ . Footing materials are M20 grade concrete and Fe415 steel. Take column size  $400\text{mm} \times 400\text{mm}$ . **11**
- Que. – 3** Attempt any TWO. **12**
- (A) What is footing? And enlist the types of footing with sketch.
  - (B) What is combined footing? Explain their types.
  - (C) Explain ADVANTAGES and DISADVANTAGES of Flat slab.

SECTION - II

- Que. - 3 Design a circular water tank for the following requirements: 12  
Diameter of tank = 5m  
Depth of water = 3.5m  
Tank rests on ground and the walls & the base slab are not monolithic.  
Use M20 & Fe415.

OR

- Que. - 4 Determine reinforcement for a column of a braced frame for 12  
the following data: Size of column: 400 x 500 mm,  $P_u = 1800\text{kN}$ ,  
 $M_{ux} = 110\text{kN.m}$ ,  $M_{uy} = 90\text{kN.m}$ , Unsupported length of column = 4m  
and effective cover = 50 mm, Use M20 concrete and Fe 415 steel.

- Que. - 5 Design the circular water tank for a capacity of 800kilolitres with 11  
flexible base i.e. walls and base are not monolithic with each other.  
Use mild steel bars for reinforcement. Draw reinforcement detailing.

OR

- Que. - 5 A short column of size 200 mm x 300 mm is subjected to 11  
factored load of 1000kN and factored moment of 80kNm 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.

- Que. - 6 Attempt the following questions. 12  
(A) What are the do's details required for general drawing,  
beam, slab and column as per SP34 (clause 5.10)?  
(B) What are No-Sway and Sway columns?  
(C) Explain the criterion of maximum reinforcement and  
minimum eccentricity in the columns.

END OF PAPER