

B.E. (Civil Engineering) Model Curriculum Semester-VII
PCC3-CE703 - Design of RCC Structures-II

P. Pages : 2

Time : Four Hours



GUG/W/24/14288

Max. Marks : 80

- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answers wherever necessary with the help of neat sketches.
 5. I.S.456 (Revised), I.S. 875 may be consulted.
 6. I.S. Hand Book for structural steel sections. I.S. Code 8000/1962 or 1964, I.S. 456 (Revised), I.S. 875 May be consulted.

- 1.** Find the moment of resistance of 'T' beam having following data. **13**
- i) Effective width of flange = 830 mm
 - ii) Effective depth of beam = 430 mm
 - iii) Width of beam = 230 mm
 - iv) Depth of flange = 100 mm
 - v) Compression reinforcement 3 nos. 25mm dia and cover to compression steel is 25mm.
 - vi) Tension reinforcement 6 nos. 25 mm dia.
 - vii) Use M20 grade of concrete and Fe415 steel.

STRAIN RELATIONSHIP STRESS FOR Fe 415		
Stress Lvl.	Total Strain	Stress N/sq. mm
0.80 fyd	0.00144	288.7
0.8 fyd	0.00163	306.7
0.90 fyd	0.00192	324.8
0.95 fyd	0.00241	342.8
0.97 fyd	0.00276	351.8
1.00 fyd	0.00380	360.9

OR

- 2.** Design a beam of the size 300 mm x 600 mm deep subjected to ultimate twisting moment of 100 kN-m, combined with bending moment of 260 kN-m and ultimate shear force of 60 kN. Assume M20 grade of concrete and Fe500 steel. **13**
- 3.** Design a pad footing for 230 mm x 450 mm column carries an axial load of 600 kN. SBC = 100 KN/M² use M20 Concrete & Fe 500 steel. **13**

OR

- 4.** A column is of the size 230 mm x 500 mm and bends in single curvature. The unsupported length of column is 6m and effective length along major axis is 4.5 m and along minor Axis is 6m. It is subjected to axial factored load of 1100 kN. It is subjected to factored Moments as below, At top M_{xx} = 120 kN-m At top M_{yy} = 180 kN-m At bottom M_{xx} = 200 kN-m At bottom M_{yy} = 150 kN-m Design the column using M20 concrete and Fe500 steel sketch details. **13**

5. a) Write notes on plastic hinge and redistribution of moments. 6
- b) A reinforced concrete fixed beam has a span of 6 m and carries two concentrated loads of 60 kN each from left and right support. Draw maximum bending moment envelope after 25% redistribution of moments. 8

OR

6. A reinforced concrete fixed beam of span 7.0 m is carrying an U.D.L. of 13.0 kN/m (Excluding self-weight) over entire span. Analyse & design the beam using 30% Redistribution of moments. Draw the reinforcement detail. Use M25 grade of concrete & Fe500 steel. 14
7. Design a combined footing for two column A & B spaced 5.6 m center to center column A is 230 mm x 300 mm in size & transmit a load of 700 kN column B is (230 mm x 400 mm) size & carries a load of 900 kN. The width of the footing is restricted to 2m only. The SBC of soil may be taken as 200 kN/m². Use M20 concrete & Fe 415 grade of steel. 20

OR

8. Design a single bay frame having 4m height and 3m width. For a single storey building, Take live load 2 kN/m² use M20 Concrete and Fe 500 steel. 20
9. Design a R.C. slab for a room measuring 4.5 m x 6.5 m size. The slab has two adjacent edges discontinuous & carries a superimposed load of 2 kN/m² & F.F. of 1.0 kN/m². Use M20 & Fe500 grade of concrete & steel provide all the check as per I.S. Code sketch the reinforcement details. 20

OR

10. Design a cantilever retaining wall for a road for the following data- 20
- Height of wall from the bottom of base to the top of stem = 5.5 m
 - Superimposed load due to traffic load = 19 kN/m².
 - Unit weight of fill = 18.5 kN/m³.
 - Angle of internal friction for fill material = 30°.
 - Allowable bearing pressure on ground = 170 kN/m².
 - Coefficient of friction between concrete & ground = 0.5 Use M20 mix concrete & Fe500 grade steel.
