Reg No. :

B.E/ B.Tech (Part Time) DEGREE EXAMINATION, NOV/DEC 2013
CIVIL ENGINEERING BRANCH (R2002/2005/2009)
V Semester

PTCE 383/PTCE 337/PTCE 9353 DESIGN OF REINFORCED CEMENT CONCRETE AND MASONRY STRUCTURES

Time: Three Hours Max Mark: 100 marks

Answer ALL questions
Relevant IS/NBC codes are permitted.
Missing data may suitably be assumed.

PART A -- (10 X 2 =20 marks)

1. Write the advantages of limit state method.
2. What is characteristic load?
3. What are balanced reinforced beams?
4. Define modular ratio.
5. Explain the advantages of two way slab.
6. List the types of staircase.
7. Distinguish between long and short columns.
8. Write the advantages of combined footing.
9. Write the advantages of masonry wall.
10. What are masonry pillars?

PART B-- (5X 16= 80 marks)

11. Explain the design philosophy of limit state design. Write the procedure to design a rectangular beam by elastic method.

12 a). A T-beam slab floor of reinforced concrete has a slab 150 mm thick spanning between the T beams which are spaced 3m apart. The beams have a clear span of 10 m and the end bearings are 450 mm thick walls. The live load on the floor is 4 kN/m^2. Using M20 grade concrete and Fe-415 HYSD bars, design one of the intermediate T-beams (Using IS 456 code).

(OR)

12 b). A rectangular beam section of 300 mm width and 500 mm effective depth is reinforced with 4 bars of 20 mm diameter. Determine the shear reinforcement required to resist shear forces (i) 50 kN, (ii) 200 kN at service

state. Consider concrete of grade M20 and steel of grade Fe 415.

13 a). Design a slab for a shop floor given c/c of span 3.2m ; width of support = 300mm ; live load on the slab = 4kN/m^2 ; finishes = 0.6kN/m^2 in addition to this the slab supports an additional strip load due to thin light weight partition wall along the span weighing 6kN/m. The width of the partition is 100mm and the width of the slab is 3m. Use M15 concrete and mild steel bars.

(OR)

13 b). Design an isolated slab panel simply supported on all four edges which carries a superimposed load of 4kN/m^2, finishes = 0.6kN/m^2 for clear spans 5m x 3m. The supporting brick walls are 300mm thick. The corners are not held down. Use M15 concrete and mild steel bars.

14 a). Design a short axially loaded square column 500x500mm for a service load of 2000kN. Use M20 concrete and Fe 415 grade steel.

(OR)

14 b). Design a reinforced square footing for a column of section 400x 400mm which is subjected to a load of 1200 kN at service state. Consider Weight of soil- 20 kN/m^3. Angle of repose=30°;
Allowable bearing capacity of soil=150 kN/m^3;
Concrete grade:M20 and steel of grade: Fe 415.

15 a). A masonry column of 250x250 mm is constructed with bricks of 10 MPa and the joints are finished by the cement mortar of 1:5 mix. Calculate the allowable load on the column. Take the overall height of the column is 2.5m.

(OR)

15 b). Design an interior wall of three storeyed residential building carry 120mm thick RCC slabs with 3m ceiling height. The wall is stiffened and it supports 2.5m wide slab on both sides.

Live load on roof = 1.5 kN/m^2

Live load on floor = 2.0kN/m^2
Weight of 100mm thick terrace =1.98 kN/m^2
Weight of floor finish = 0.30 kN/m^2.