PVP 14

Code: CE6T1

III B.Tech - II Semester – Regular Examinations – May 2017

DESIGN AND DRAWING OF CONCRETE STRUCTURES – II
(CIVIL ENGINEERING)

Note: Use of IS 456-2000 & IS: 1343 - 1980 and IS 1893 (Part-1) - 2002 are allowed

Duration: 3 hours Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

1.

a) How is the design of combined slab and beam footing different from combined slab footing?
b) Briefly describe the behaviour of various elements of a cantilever retaining wall?
c) Express Rankine's formula in retaining wall design?
d) Explain how the unbalanced moment is transferred from slab to column in flat slabs.
e) Describe the various steps involved in the design of grid slabs.
f) What is ductility factor?
g) Explain advantages of Pre-stressed concrete compared Reinforced concrete.
h) Explain about Freyssinet prestressing system.

i) Write the time dependent losses in prestress system.
j) What is elastic deformation?
k) What is load balancing concept?

PART – B

Answer any *THREE* questions. All questions carry equal marks.
3 x 16 = 48 M

2. A Prestressed concrete beam of rectangular section 400 X 600 mm has a span of 6 m. The beam is prestressed by a parabolic cable providing a prestressing force of 1000 kN. The cables has an eccentricity of 100 mm at the centre and no eccentricity at the ends. If the total external load on the beam is 35 kN/m on the whole span, calculate the extreme stresses for the mid span section using following methods:
   a) Stress concept method 8 M
   b) Load balancing method 8 M

3. A prestressed concrete pile is 300 mm X 300 mm in section and is provided with 40 wires of 3mm diameter distributed uniformly over the section. Initially the wires are tensioned in the prestressing beds with a pull of 450 kN. Determine the final stress in concrete and the percentage loss of stress in the wires. M40 concrete

$E_S = 2 \times 10^5$ MPa,

Shrinkage strain = 200×10^{-6}

Relaxation loss of stress in steel = 4.5 % of the initial stress

16 M

4. a) Explain different measures of ductility. 8 M

b) Explain Pre Tensioning and Post Tensioning. Explain any four advantages and disadvantages in pre and post tensioning. 8 M

5. Design an interior panel of a large single storey warehouse flat slab roof with a panel size of size 6 m X 6 m (with drop panels) supported by columns of size 500 mm X 500 mm. The height of columns is 5m. Take live load on panel is 4 kN/m^2 and weight of floor finishes including waterproof treatment as 2.5 kN/m^2. Use M25 grade concrete and Fe 415 grade steel. Assume mild environment. 16 M

6. Design an isolated footing for a column, 300 mm X 500 mm, reinforced with 6-25 mm bars with Fe 415 grade steel and M25 grade concrete, Subject to factored axial load of P_u= 1000 kN and factored moment of 120 kNm (with respect to major axis) at the column base. Assume that the moment is reversible. The safe soil bearing capacity may be taken as 200 kN/m^2 at a depth of 1.25 m. Assume M 20 concrete and Fe 415 steel for footing. 16 M