F 3343 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Seventh Semester

Branch : Civil Engineering

CE 010 703—DESIGN OF CONCRETE STRUCTURES—II (CE)

(New Scheme—2010 Admission onwards—Regular/Supplementary)

Time : Three Hours Maximum : 100 Marks

Relevant IS Codes are permitted.

Part A

Answer **all** *questions.*
Each question carries 3 *marks.*

1. Explain basic principle of prestressed concrete.
2. List notes on counterfort retaining walls.
3. Write notes on development length requirements at supports for beams.
4. List notes on nature of stresses in spherical domes.
5. Explain in general about stagings and bracings in water tanks.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Explain about pretensioning and post-tensioning systems in prestressing.
7. Explain active earth pressure and passive earth pressure.
8. Find the ultimate moment of resistance of a 120 mm. thick slab, reinforced with 8 mm. ϕ bars at 180 mm. spacing located at an effective depth of 80 mm. Assume M20 concrete and Fe 415 steel.
9. Explain about analysis of stresses in a spherical dome of uniform thickness under a concentrated load at crown.
10. Explain about flexible and rigid joints in water tanks.

(5 × 5 = 25 marks)

Turn over

Part C

Answer **all** *questions.*
Each question carries 12 *marks.*

11. (a) Explain in detail about various losses in prestress.

Or

(b) A RC beam, 120 mm. wide by 250 mm. deep spanning over 9 m. is prestressed by a straight cable carrying an effective prestressing force of 250 kN located at an eccentricity of 45 mm. The beam supports a live load of 1.5 kN/m. Calculate the resultant stress distribution for central cross-section of beam. The density of concrete is 25 kN/m.^{3}

12. (a) Design a cantilever retaining wall for following data :

(i) Height of earth to be retained is 7 m. above bottom base with level top and surcharge of 1850 kg./m.^{2}

(ii) Angle of repose of soil $\phi = 28°$.

(iii) Bearing pressure of soil = 160 kN/m.^{2}

(iv) Coefficient of friction between soil and base slab = 0.50.

Or

(b) Design a counterfort retaining wall to retain earth 6.0 above basement level. The density of earth is 17,000 N/m^3 and $\phi = 27°$. The bearing capacity of soil is 130 kN/m^2.

13. (a) Design a simply supported slab for a room of dimensions 3 × 4 m. and 240 mm. thick brick wall around. Assume slab corners are free to lift up. Take live-load of 3.5 kN/m^2 and finish load of 1 kN/m.^{2}

Or

(b) Explain in detail about circular beams with u.d.l. on symmetrically placed columns.

14. (a) Design a short square column, with effective length 3.5 m. of resisting a P_u = 1500 kN and M_u = 80 kNm under uniaxial eccentricity. Assume M25 concrete and Fe 415 steel.

Or

(b) Design a short circular column with spiral reinforcement having effective length, 2.5 m. capable of resisting P_u = 1000 kN and M_u = 50 kNm under uniaxial eccentricity.

15. (a) Explain in detail about design of ground supported and overhead water tank in detail.

Or

(b) Explain in detail about design of circular water tanks with flat bottom.

(5 × 12 = 60 marks)