6E 3033

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B.Tech.VI Semester (Back) Examination, May 2015

Civil Engineering

6CE2(O) Concrete Structures-II

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Use of followinf supporting material is permitted during examination.

1.IS 456

Unit - I

1. A rectangular beam 100mm wide and 150mm deep is prestressed with two 12mm high tensile steel placed all through the simply supported span of 2.2m at 25m from bottom.The prestress in steel is 400 N/mm2 and shrinkage upto the time of loading is 0.000060. Calculate the maximum stress in steel and concrete at the time of loading with 9KN concentrated load at each of the third points, assuming m=7. Consider losses due to elastic shortening and shrinkage, Assume $E=2.1x10^5 N/mm^2$ **(16)**

OR

1. A post tensioned prestress concrete beam of 28m simply supported span is subjected to a prestress of 3700KN at transfer . Profile of the cable is parabolic with maximum eccentricity of 185mm at the center. Determine the loss of prestress and the jacking force required if jacking is done from both ends of the beam. The beam is 400 mm wide and 750 mm deep and is prestressed with 9 cables each consisting of 12 wires of 6mm diameter. Assume Es and Ec as $2x10^5 N/mm^2$ and $3x10^4 N/mm^2$ respectively. Each cable is tensioned at a time . **(16)**

Unit - II

2. Determine the reinforcement required for a rectangular beam section with the following data width of section. 300mm, Depth of section 550mm factored B.M:80KN-m, Factored torsional moment 50KNm, factored shear force=60KN. Use M-20 grade concrete and Fe 415 grade steep **(16)**

OR

2. Design a continuous reinforced concrete beam of rectangular section to support a dead load of 10KN/m and live load of 13KN/m over three spans of 6.2 m each. The ends are simply supported. Take M-20 grade concrete and Fe 415 Grade steel. Sketch the details of reinforcement in the beam **(16)**

Unit - III

3. A spherical dome, span 10m and rise 2m, has a shell which is 120mm thick. It carries a lantern load of 5000 N at its apex. The wind load on the dome is estimated to be equivalent to 1200 N/m^2. Examine the stresses in dome and design suitable reinforcement. **(16)**

OR

3. A rectangular slab 6m by 4.5m is simply supported at the edges. The coefficient of orthotrophy is 0.7(μ) If the ultimate design load is 16 KN/m^2 estimate the ultimate moment capacity of the slab in the short span direction using yield line theory **(16)**

Unit - IV

4. Design the top dome, cylindrical wall and ring beams at top and bottom of the cylindrical well for an into tank of 8 lac litres. The height of staging is 15m upto the bottom of tank. The bearing capacity of soil may be assumed to be 150KN/m^2. Assume the intensity of wind pressure as 1500 N/m^2 Use M20 concrete and Fe 415 grade steel. **(16)**

OR

4. An open rectangular tank 4.5m×7m×3m deep rests on firm ground. Design the tank Use M20 concrete **(16)**

Unit - V

5. Design a slab culvert for class A loading for a clear Span=4.0m clear roadway =7.0m. Average thickness of wearing coat=80 mm. Use M25 concrete **(16)**

OR

5. Design a cantilever retaining wall to retain an earth embankment 4.5m high above ground level the density of earth is 18 KN/$m^3$and its angle of repose is 30°. The embankement is horizontal at top. The safe bearing capacity of soil may be taken as 200KN/m^2 and the coefficient of friction between soil and concrete is 0.5 Take M25 concrete and Fe415 steel. **(16)**
