

B.TECH 6TH SEM.

DCS -II

PAPER: CE -302 –F

MAY - 2013

1. Write notes on :

- (a) Calculation of bending moment and shear force in continuous beams.
- (b) Pile foundations.
- (c) Losses in pre stress concrete.
- (d) Stiffness of members in frame.

5×4 =20

SECTION - A

Q.NO. 2. Design a continuous beam of 3 spans supported on stone masonry piers 300mm by 300mm .Clear span between the supports = 8 m.

Spacing of continuous beams = 2.75 c/c

Self weight of floor finish = 0.6 kN/m²

Live load or office floor = 4 kN/m²

Concrete of M-20 grade and Fe- 415 steel are available for use.

Design the reinforcements for the critical sections.

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Q.NO. 3 Design an interior panel of a flat slab for a live load of 5000N/m² .

Drops shall be provided. All panels are 6m × 6m. Use M-20 grade concrete and mild steel reinforcement.

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SECTION –B

Q.NO. 4. Design a rectangular slab footing to support two columns transmitting 515kN and 990 kN load . The columns are each 450 mm square and are spaced at 2.5 centres. The lighter column is at a clear distance 300 m from an existing building. Design the footing using M-15 concrete HYSD bars if the safe bearing capacity of the soil is 175 kN/m² .

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Q.NO. 5 Design a circular tank 12 meter diameter and 4 meter high. The tank rests on firm ground. The walls of the tank are restrained at the base. Use M20 concrete and mild steel reinforcement. Adopt safe stresses.

$C = 70 \text{ kg/cm}^2$, $t = 1000 \text{ kg/cm}^2$.

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SECTION-C

Q.NO. 6 A pre stress concrete beam 500 mm × 750 mm in section has a span of 8m and is subjected to u.d.l. of 17.50 kN/m including the weight of the beam. The prestressing tendons are located at the lower third point of the section and provide an effective prestressing force of 1500 kN . Determine the extreme stresses in concrete for the mid span section.

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Q.NO. 7 The roof of a 8m wide hall is supported on an portal frame spaced at the 4m intervals. The height of the portal frame is 4m. The continuous slab is 120mm thick. Live load on roof is 1.5 kN/m^2 . The columns are connected with a plinth beam and the base of the column may be assumed as fixed. Design the column of the portal frame. Use M-20 grade concrete and Fe-415 HYSD bars.

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SECTION -D

Q.NO. 8 A rectangular slab measuring $6\text{m} \times 10\text{m}$ is subjected an u.d.l. of 10kN/m^2 . If the maximum moment resisting capacity of slab in sagging and hogging is 25kNm/m run and 31.25kNm/m run.

Find the load factor which will cause failure of the slab by yield line theory.

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Q.NO. 9 A singly supported two way slab having dimension $3\text{m} \times 4\text{m}$ is subjected to a uniformed distributed load (u.d.l.) of 10 kN/m^2 . Find the collapse load factor using yield line theory.

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