

B.Arch. Part –III, 5th Semester Examinations, 2012
Sub: Structural Engineering-III
(CE-501A)

Time: 3 hours

Full Marks: 70

Use of IS: 456, 2000 is permitted

Answer **Q.1** and any **THREE** from the rest.

Assume any data reasonably, if required. All the notations used have their usual meanings.

Q.1 Draw bending moment and shear force diagram for the beam shown in Fig. Q.1. use moment distribution method.

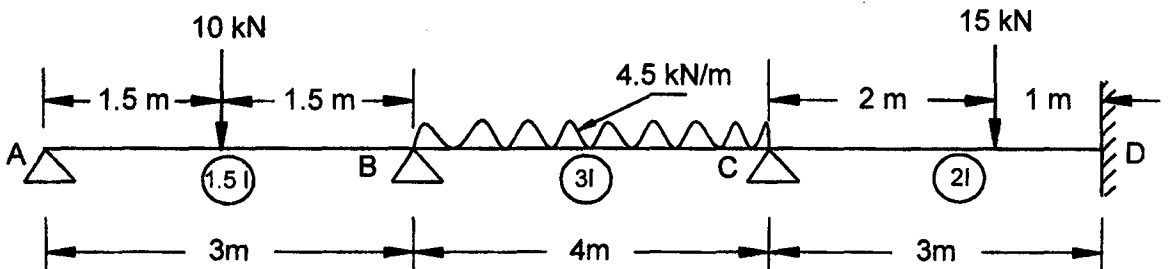


Fig. Q.1

(16)

Q.2 Design a flat slab panel of size 5.5 m × 7.5 m, continuous all the four edges with the live load as 4.5 kN/m² and self weight of floor finish as 1 kN/m². Use M20 and Fe415 as the materials grades.

(18)

Q.3 Design a R.C. slab for a room 3.5 m × 5.5 m size. The slab is simply supported on all the four edges, with corners held down and carries a superimposed load of 4.5 kN/m², inclusive of floor finish etc. Use M20 mix, Fe415 steel and I.S. Code method.

(18)

Q.4 Design a rectangular beam for an effective span 6.5 m. The superimposed load is 80 kN/m and size of the beam is limited to 30 cm × 70 cm overall. Use M20 grade of concrete mix and Fe415 grade of steel. Take, $d'/d = 0.11$, $\sigma_{sc} = 353 \text{ N/mm}^2$

(18)

Q.5 Design the reinforcements of a circular bored pile of diameter 450 mm and length 18 m. the design axial load is 500 kN. Use M20 mix and Fe415 grade of steel.

(18)

Q.6 Design a combined rectangular footing for two columns 'A' and 'B', carrying loads of 600kN and 750kN respectively. Column 'A' is 350 mm × 350 mm in size and column 'B' is 450 mm × 450 mm in size. The centre to centre spacing of the columns is 3.7m. The safe bearing capacity of soil may be taken as 150 kN/m². Use M20 grade of concrete mix and Fe415 grade of steel.

(18)