FACULTY OF ENGINEERING

B.E. 3/4 (Civil) I-Semester (Supplementary) Examination, June/July 2011
REINFORCED CEMENT CONCRETE

Time : Three Hours]

[Maximum Marks : 75

Answer **ALL** questions from Part-A.

Answer any **FIVE** questions from Part-B.

IS-456—2000 is allowed.

PART—A (Marks : 25)

1. How workability of concrete is evaluated ? 2

2. What are the grades of concrete recommended by the IS codes ? 2

3. What is min. and max. percentage of steel in column ? 2

4. How the development length of the bar calculated in the compression zone ? 2

5. What are the uses of stirrups in the column ? 2

6. Explain the merits and demerits of WSM and LSD. 3

7. Draw the yield line pattern for a simply supported slab on all edges. 3

8. Write at least two situations in which a doubly reinforced beams are necessary. 3

9. What are the fundamental assumptions in LSD ? 3

10. What is the difference between short and long column ? 3

PART—B (Marks : 50)

11. A R.C.C. beam 250 mm × 600 mm deep has 4–20 mm ϕ as tension reinforcement, the center of bars are located at 50 mm from the bottom. Determine the uniformly distributed load, that the beam can carry over a simply supported span of 6 m. The grade of concrete is M_{15} and steel Fe_{250}. m = 19 (working stress method). 10

12. Design a rectangular beam using limit state design for an effective span of 6 m if the load on the beam is 80 kN/m. The size of the beam is limited to 300 mm × 700 mm. Use M_{20} concrete and Fe_{415} steel. 10

13. Design a two-way slab 4 m × 6 m is to carry a service load of 10 kN/sq.m. Use M_{20} grade and Fe_{415} steel. The slab is simply supported on all four sides. 10

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14. Design an axially loaded circular column of diameter 400 mm to carry a factored load of 2500 kN. Use Fe_{415} steel and M_{20} grade of concrete. Use fied column and sketch the reinforcement. 10

15. A column carries an axial load of 2000 kN and is of section 300 mm × 500 mm. S.B.C. of soil is 140 kN/sq.m. Using M_{20} grade of concrete and Fe_{415} steel, design the footing of the column. 10

16. Design an interior RC slab panel of dimension as 6 m × 5 m to support a line load 3 kN/m^2 and floor finish 1 kN/m^2. 10

17. Design a rectangular section of size 300 mm × 550 mm has to resist BM = 100 kW-m, shear force = 60 kW and twisting moment = 30 kW-m. Use M_{30} grade and Fe_{415} steel. 10