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35030

Printed Pages : 3

BT-5 / D-19

DESIGN OF CONCRETE STRUCTURES-I

Paper–CE-303 E Opt. (02)

Time allowed : 4 hours] *[Maximum marks : 100*

Note : (1) Assume any missing data appropriately. Use M20 grade concrete and Fe415 grade steel, wherever required. Use of IS : 456 is permitted. Sketch reinforcement details wherever required.

(2) Attempt any five questions selecting at least one question from each unit.

Unit–I

1. (a) What is meant by shrinkage and creep of concrete ? Enumerate various factors influencing strength and durability of concrete. 10

   (b) Enumerate various types of cement commonly used in RC works. Discuss any three in detail in respect of their specific use. 10

2. (a) Difference between working stress and limit state method of design, factor of safety and partial safety factor and working load and factored load. 10

   (b) Discuss design curves for materials and actual stress strain behaviour of high strength steel. 10

Unit–II

3. Design a RC beam 230×450 mm to carry a bending moment of 25 kN/m in addition to its self weight. Also design shear reinforcement if it is simply supported over a span of 4.75m. Use Limit State Method. 20

4. Design a L-beam section for the hall of a building 12×5 m in size and carrying a live load of 2.5 kN/m² over the slab in addition to self weight of the slab, which is 150 mm thick. The beams are spaced at 4 mc/c. Use Working Stress Method of design. 20

Unit–III

5. A RC square column is subjected to an axial load of 1500 kN and moment of 50 kN-m. Design the column section and its reinforcement. 20

6. (a) List various types of columns and footings commonly used in buildings. Also differentiate between short and slender columns. 10

   (b) A square column 450 mm dia. is subjected to an axial load of 2500 kN. Design a suitable footing for the column if safe bearing capacity of soil is 80 kN/m². 10

Unit–IV

7. (a) Design a a slab panel with shorter span 3.5m and 7.5 m as longer span c/c, subjected to a live load of 3.0 kN/m². The floor finish is 2.0 kN/m². Also check slab for shear and deflection, and sketch reinforcement details. 15

   (b) How will you design two way slabs subjected to concentrated loads. 5

8. A cantilever type of retaining wall is to retail level earth of 3m above N.G.L. whose horizontal surface is subjected to a surcharge of 10 kN/m². SBC of soil is 100kN/m² and angle of repose is 30 degrees. Unit weight of soil may be taken as 15kN/m³. Coefficient of friction at base is 0.50. 20