

3423
BOARD DIPLOMA EXAMINATION, (C-09)
JUNE - 2019
*** DIPLOMA IN CIVIL ENGINEERING**
R.C.STRUCTURES
FOURTH SEMESTER EXAMINATION

Time: 3 Hours

Total Marks: 80

PART - A (10 x 3 = 30 Marks)

Note 1: Answer all questions and each question carries 3 marks

2: Answers should be brief and straight to the point and shall not exceed 5 simple sentences

3. Use of Is: 456-2000 & Is: 875-1987 code Books are permitted.

1. Find modulus of elasticity of concrete as per IS 456-2000 for M30 concrete.
2. State the limiting values of depth of neutral axis for different grades of steel from assumptions made in limit state method.
3. Calculate the development length in compression for Fe250 bar of 12 mm diameter and M20 concrete.
4. Draw the sketch of a standard hook. What is its anchorage value?
5. A one way slab of 150 mm overall depth is provided with 12 mm dia. bars at an effective cover of 30 mm as main reinforcement. Calculate the area of steel required for distribution reinforcement. Use mild steel.
6. Write the code provisions for maximum spacing of bars in slabs .
7. Find the effective flange width of the following simply supported T beam.
 Effective span = 6 m
 c/c distance of adjacent panels = 4.0 m
 Breadth of the web = 300 mm
 Thickness of slab = 120 mm
8. Draw the line diagram of a continuous beam and indicate salient points with Shear force equations at inner and outer side of support next to end support.
9. Calculate the maximum bending moment at other interior support for a continuous beam as per IS 456-2000. Size of beam is 300 X 500mm overall, effective span = 4 m, imposed load (not fixed) = 10 KN/m, imposed load (fixed) = 15 KN/m excluding self weight, effective cover = 40mm.
- * 10. Calculate the load carrying capacity of a short axially loaded column of size 300 X 300 mm reinforced with 6 bars of 16mm diameter Fe 415 grade steel .Concrete is M20 grade.

PART - B (5 x 10 = 50 Marks)

Note 1: Answer any five questions and each question carries 10 marks

2: The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer

11. a) A reinforced concrete beam 250 mm wide and 400 mm overall depth is reinforced with 3 bars of 16 mm diameter at an effective cover of 50 mm. Using M20 grade concrete and Fe 415 steel, find the depth of neutral axis. Use working stress method.
- b) Determine the moment of resistance for the above beam.

12. A singly reinforced concrete beam section 300 X 550 mm overall is reinforced with 5 bars of 12 mm diameter with an effective cover of 50 mm. The beam is simply supported over a span of 5.5m. Find the uniformly distributed load the beam can carry. Use M25 grade concrete and Fe 415 steel. Use limit state method .
13. Design a simply supported singly reinforced rectangular RC beam for flexure over a clear span of 6 m. The superimposed load is 30 KN/m and width of supports is 230 mm each. Use M20 grade concrete and Fe 415 steel. Check for deflection .
14. Design a simply supported RCC slab for a verandah of clear dimensions 3 X 9 m. width of supports is 230mm. Superimposed load is 3 KN/Sq.m and weight of finishes is 0.7 KN/Sq.m. Use M 20 concrete and HYSD bars of Fe 415 grade. Check for deflection.
15. A T beam of effective flange width 750 mm, thickness of slab 120mm, width of rib 250mm, and effective depth 450mm is reinforced with 3500Sq.mm of tension steel. Calculate the moment of resistance of the section. M20 grade concrete and Fe415 bars are used.
16. A continuous RCC rectangular beam is supported on 230 X 230 mm RCC columns at clear intervals of 3 m. The beam carries a dead load of 12 kN/m including its self weight and an imposed load of 8 kN/m. Design the beam at the support next to end support. Use M 20 grade concrete and Fe 415 grade steel.
17. Design a short Reinforced Concrete rectangular column with one side as 300mm to carry an axial load of 2000 KN. Use M25 concrete and Fe 415 steel.
18. Design a square reinforced concrete footing of uniform thickness for a RC Column of 400 X 400mm carrying an axial load of 1200 KN using M20 grade concrete and Fe 415 steel. The safe bearing capacity of soil is 220 KN/ m². Check for development length and check for bearing pressure are not required.

- xxx -

*

*