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BOARD DIPLOMA EXAMINATION
JUNE - 2019
*** DIPLOMA IN CIVIL ENGINEERING**
REINFORCED CONCRETE STRUCTURES
FOURTH SEMESTER EXAMINATION

Time: 3 Hours

Total Marks: 80

PART - A (3m x 10 = 30m)

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 code books Is: 456-2000 & IS: 875-1987 are permitted.

1. Differentiate between Nominal mix concrete and Design mix of concrete
2. What is limit state? State limit states of serviceability
3. Write the formula for calculating spacing of vertical stirrups for minimum shear reinforcement. State IS code provisions for maximum allowable spacing of vertical stirrups
4. Define doubly reinforced beam and mention two situations where it is used
5. State the functions of distribution bars in slabs
6. Explain the provision of torsion reinforcement in two way slabs with corners held down as per IS 456-2000
7. State 3 cases of T beams with respect to neutral axis position in T beam
8. A continuous RCC rectangular beam of size 250 X 500 mm effective is supported on 300 X 300 mm masonry columns at clear intervals of 5 m. Calculate the effective span
9. Draw the line diagram of a continuous beam and indicate salient points with bending moment equations at the middle of end span and interior span
10. Calculate the load carrying of an axially loaded short column of diameter 300mm reinforced with 6 bars of 16 mm diameter. Use M20 concrete and Fe 415 steel

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PART - B **(10m x 5 = 50m)**

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

2: The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer
 3. Assume missing data, if any suitably.

11. Design a singly reinforced simply supported RCC rectangular beam of width 300 mm using M20 concrete and Fe 415 steel to carry a superimposed load of 20kN/m excluding self weight. Clear span is 6m and width of support is 300 mm . Use working stress method
12. A singly reinforced concrete beam section 300X550 mm overall is reinforced with 5 bars of 12mm diameter with an effective cover of 50 mm. Find the moment of resistance of the beam. Use M25 grade concrete and Fe 415 steel. Use limit state method
13. Design a RC lintel for flexure over an opening of 2.5 m wide. The height of brick work above the opening is 3.5 m. Masonry weighs 19 kN/Cum. The brick walls are 230 mm wide and lintel has a bearing of 230 mm on walls on either side. Use M25 grade concrete and Fe 415 steel
14. Design the floor slab for a hall 4m X 6m to carry a live load of 3 kN/Sq.m and floor finish of 1 kN/Sq. m. The slab is restrained and is discontinuous over two long edges. Walls are 300 mm wide. Use M20 grade concrete on Fe 415 steel
15. A T beam of effective flange width 800mm, thickness of slab 90mm, width of rib 230mm, and effective depth 400mm is reinforced with 5 number of 20mm diameter bars. Calculate the moment of resistance of the section. M20 grade concrete and Fe415 bars are used
16. A continuous RCC rectangular beam of size 250 X 500 mm overall is supported on 300 X 300 mm masonry columns at clear intervals of 4 m. The beam carries a dead load of 20 kN/m including its self weight and imposed load of 12 kN/m. Concrete is M20 grade and steel is Fe 415 grade. Design the reinforcement at support next to end support and interior support section
17. Design a short Reinforced Concrete column of square section to carry an axial load of 800 KN. Use M20 concrete and Fe 415 steel
18. A reinforced concrete column of size 230 mm X 230 mm carries a load of 750 kN. The safe bearing capacity of soil is 150 kN/m². Design an isolated square column footing of uniform thickness. Use M25 grade concrete and Fe 415 grade steel. Check for development length and check for bearing pressure are not required

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