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BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL - 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. Draw the stress diagram for a RC beam section in limit state method and indicate salient values.
2. State any three advantages of limit state method over working stress method.
3. A singly reinforced concrete beam of size 230X400 mm effective is reinforced with 4 bars of 20 mm dia. Fe415 grade. Grade of concrete is M20. Calculate the permissible shear stress in concrete.
4. Draw the sketch of a standard hook. What is its anchorage value?
5. What is the minimum percentage of steel to be provided in slabs as per IS456 – 2000.
6. State the functions of distribution bars in slabs.
7. Find the effective flange width of following simply supported T beam.
   Effective span = 5.4 m
   c/c distance of adjacent panels = 3.0 m
   Breadth of the web = 230 mm
   Thickness of slab = 120 mm
8. 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 3 m. Calculate the effective spans.
9. What are the conditions to be satisfied to adopt the moment and shear coefficients given in IS 456-2000 for continuous beams/ slabs?
10. Calculate the load carrying capacity of a axially loaded short column of diameter 300 mm, reinforced with 6 bars of 16mm diameter Fe 415 grade steel. Concrete is M 25 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) Define Under reinforced, Balanced and over reinforced sections in Working Stress method.
    b) Explain i) Neutral axis factor ii) lever arm factor and iii) M.R factor.
12. A doubly reinforced beam of width 250 mm and 550 mm effective depth is reinforced with 2 bars of 16 mm diameter in compression zone and 4 bars of 20 mm diameter in tension zone. Find the ultimate moment of resistance of the section. Effective cover is 50 mm for both the steels. Concrete grade is M 25 and steel is Fe 415.
13. Design a RC lintel for flexure over a door of 1.2m wide. The height of brick work above the opening is 2m. Masonry weighs 19 kN/C.m. The brick walls are 230 mm wide. Use M 20 grade concrete and Fe 250 steel.

14. Design a simply supported RCC slab for a room of clear dimensions 3 X 8m. width of supports is 250mm. Superimposed load is 2 KN/Sq.m and weight of finishes is 1.0 KN/Sq.m. Use M 25 concrete and HYSD bars of Fe 415 grade. Check for deflection.
15. A T beam of effective flange width 800 mm, thickness of slab 90 mm, width of rib 230mm, and effective depth 400mm is reinforced with 5 numbers of 20mm diameter bars. Calculate the moment of resistance of the section. M20 grade concrete are Fe415 bars are used.
16. A continuous RCC rectangular beam of size 300 X 500 mm effective is supported on 300 X 300 RCC columns at 3 m intervals. The beam carries a dead load of 15 kN/m including its self weight and imposed load of 10 kN/m. Design the reinforcement for the beam at the support next to end support.
17. Design a square column 400X400 mm, 3.3m long subjected to a working load of 1000kN. The column is effectively held in position and direction at both ends. Use M20 concrete and Fe 415 steel.
18. A square isolated uniform RC footing 2500 X 2500 mm is 550 mm thick, supports a RC column 300 X 300mm. Net upward soil pressure on footing is 288 KN/$m^{2.}$ 16 mm diameter bars at 220mm c/c is provided in footing in both the directions. Effective cover for bars in footing is 50mm. Using M20 concrete and Fe 415 steel check the footing for one way shear, punching shear, development length and bearing pressure.

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