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C09-C-402

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**BOARD DIPLOMA EXAMINATION, (C-09)
OCTOBER/NOVEMBER-2018
DCE - FOURTH SEMESTER EXAMINATION**

RC STRUCTURES

Time : 3 Hours]

[Total Marks: 80

PART-A

3X10=30

Instructions :

1. Answer **All** questions.
2. Each question carries **three** marks.
3. Answer should be brief and straight to the point and shall not exceed five simple sentences.

1. Differentiate between nominal mix and design mix of concrete.
2. List various limit states to be considered in limit state method.
3. List and sketch various forms of shear reinforcement of beams
4. The dimensions of a singly reinforced, simply supported rectangular beam are 230mm wide and 400mm. deep effective, provided with Fe 415 grade steel and M20 grade concrete. Determine the limiting moment of resistance of the beam.
5. State the IS code provisions for limiting vertical deflections for different types of beams/slabs.
6. State the IS code provisions for design of torsion reinforcement in two way slabs.
7. Find the effective flange width of the following isolated T-beam.

Effective span	=	5.4m
Breadth of the web	=	230mm
Thickness of slab	=	150mm
Width of the support	=	230mm
Actual width of the flange	=	750mm
8. A continuous RCC rectangular beam of size 250 x 500mm overall is supported on 300 x 300mm masonry columns at clear intervals of 3m. Calculate the effective spans.

9. 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.
10. Calculate the load carrying capacity of an axially loaded short column of diameter 230mm, reinforced with 6 bars of 12mm diameter. Use M20 grade concrete and Fe415 grade steel.

PART-B

10X5=50

Instructions :

1. Answer any **Five** questions.
2. Each question carries **ten** marks.
3. Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer

11. Design a singly reinforced simply supported RCC beam using M20 concrete and Fe415 steel to carry a superimposed load of 20 KN/m excluding self weight. Clear span is 6m and width of supports is 300mm. Use working stress method.
12. Design a RC lintel for flexure over a opening of 2.5m wide. The height of brick work above the opening is 3.5m. Masonry weights 19 KN/Cum. The brick walls are 230mm wide and lintel has a bearing of 200mm on wall on either side. Use M 20 grade concrete and Fe 415 steel.
13. An RCC beam 250mm wide and 450mm deep effective is reinforced with 6 bars of 16mm diameter on tension side of which two bars are cranked up near the support. If the design shear force is 120 KN, design the shear reinforcement considering bent-up bars. Concrete is M20 grade and steel Fe415.
14. Design a simply supported RC slab for a room of clear size 4 x 5m, live load is 2 KN/Sq.m. and weight of finishes is 0.60 KN/Sq.m. The corners of slab are unrestrained. Width of supports is 250mm. Use M20 grade concrete and 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 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 250 x 500mm overall is supported on 300 x 300mm masonry columns at clear intervals of 4m. The beam carries a dead load of 20 KN/mm including its self weight and imposed load of 12 KN/m. Concrete is M20 grade and steel is Fe415 grade. Design the reinforcement at
 - (a) Middle of end span
 - (b) Middle of interior span.

17. Design a circular column of diameter 400mm with lateral ties. Unsupported length of column 3m and is subjected to a working load of 1200 KN. The column is effectively held in position at both ends but not restrained against rotation. Use M25 concrete Fe415 steel.

18. List and explain the steps for design of isolated square footing of uniform thickness.

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