C14-C -**501**

4618

BOARD DIPLOMA EXAMINATION, (C-14)

JUNE-2019

DCE - FIFTH SEMESTER EXAMINATION

DESIGN & DETAILING OF R.C. ELEMENTS

Time:3 Hours Max.Marks:80

PART-A

10x3=30M

Instructions: 1) Answer all questions.
2) Answer should be brief and stright to the point and shall not exceed five simple sentences.
3) IS 456-2000 and SP-16 Codes are permitted.
4) Answer all questions in limit state method, unless mentioned as working stress method

1) Distinguish between "Nominal Mix" and "Design mix" Concretes.

2) State the significance of Partial Safety Factors in the Limit State Design.

3) Sketch the strain deaigram and stress block for a singly reinforced rectangular beam indicating salient values in compression zone and tension zone.

4) State different forms of shear reinforcement provided in beams.

5) State the minimum percentage of reinforcement to be provided in slabs for mild steel bars and HYSD bars.

6) State the IS code provisions for torsion reinforcement for restrained slabs.

7) Determine the effective flange width of the simply supported isolated Tee beam, if effective span = 4.0m, web width =300 mm thickness of slab = 100 mm, width of support =300mm. The actual width of flange is 900 mm.

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8) Give the coefficients for obtaining bending moments for fixed and imposed laod conditions at salient points of a continuous beam as per IS456-2000

9) Calculate the maximum factored bending moment at middle of interior Span of a three span continuous floor slab carrying 7.8 kN/m of factored dead load and 4.25 kN/m of factored live load. Take effective span as 3.5m.

10) State any four requirements for the longitudinal reinforcement in a column as per IS 456-2000.

PART-B

10x5=50M

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.
4) Answer all questions in limit state method, unless specified as working stress method.

11) (a) Write the expressions for design constants in working stress method, explaining the terms involved. (4m)

(b) A singly reinforced rectangular cement concrete section 300 mm wide and 500 mm effective depth is reinforced with 4 bars of 16 mm diameter HYSD steel of grade fe 415. M 20 mm concrete is used. Find the type of beam section . Use working stress method. (6m)

12) A singly reinforced concrete beam 230 mm X 450 mm effective depth is reinforced with 4 bars of 20 mm diameter. The beam is simply supported over a span of 4.8 m. Find the safe uniformly distributed load the beam can carry exclusive of its self weight. The materials used are M 20 grade concrete and Fe 415 grade steel.

13) Design the shear reinforcement required for a singly reinforced beam of size 275 mm X 575 mm effective depth. The beam carries a working load of 100 kN/m (including self weight) over a span of 5.5 m and it is reinforced with 4 no. of 20 mm dia. HYSD steel bars of grade Fe 415. M20 grade concrete is used.

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14) Design the floor slab for a hall of clear dimensions 3.6 m X 5.4 m. The floor carries a weathering course of 1 kN/m^2 and a live load of 2.5 kN/m^2. The slab is continuous over two adjecent walls of the hall. The width of walls is 300 mm .M 20 Grade concrete and Fe 415 steel are used.

15) The dimensions of a T-beam section are as follows;

Width of flange	=	900 mm
Thickness of flange	=	100 mm
Rib width	=	300 mm
Overall depth	=	600 mm
Effective cover	=	50 mm
Area of steel	=	2500 mm^2
Materials used	=	M20 Concrete & Fe 415 steel.

calculate the moment of resistance of the beam.

16) A Continuous RCC rectangular beam of size 250 X 400 mm overall is supported by 250mm x 250 mm size masonary columns at clear intervals of 4.5 m. The beam carries a dead load of 24 kN/m including its self weight and an imposed load of 15 kN/m. The concrete used is of grade M20 . Design the reinforcement for the support next to end support section using 20 mm and 16 mm diameter fe 415 grade HYSD steel bars.

17. Design a short column square in section to carry an axial load of 1000 kN. Use concrete of grade M20 and reinforcement bars of grade Fe 415. Take the load factor equal to 1.5

18. An RC Column of size 400 mm X 400 mm carries an axial load of 1600 kN.The safe bearing capacity of soil is 210 kN/m^2 Design an isolated square column footing of uniform thickness. Use M25 grade concrete and fe 415 steel. Check for development length and Bearing pressure need not be done.

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