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Department of Civil Engineering

Sample Question Paper for Theory of Reinforced Concrete Structure

Q1. Solve all questions mandatory **2marks each**

1 The stress strain curve for concrete is considered parabolic by I.S. code upto a strain of

(a) 0.0015

(b) 0.0020

(c) 0.0030

(d) 0.0035

2 For M20 grade of concrete, the maximum shear stress shall not exceed

a) 1.6 N/mm2

b) 1.9 N/mm2

c) 2.8 N/mm2

d) 2.2 N/mm2

3 What is the minimum number of longitudinal bars provided in a reinforced concrete column of circular circular cross-section ?

a) 4

b) 5

c) 6

d) 8

4 The maximum area of tension reinforcement in beams shall not exceed _____

a) 2%
b) 4%
c) 0.15%
d) 1.5%

5 In case of pre tensioned member, the computations of transmission length are influenced by?

a) Bond
b) Flexure
c) Torsion

d) Tension

6 An unrestrained reinforced concrete slab of effective dimension4.5m × 6.0m is simply supported on all four walls. 12mmdiameter bars are used in the direction of shorter span and 10mm diameter bars are used in the direction of longer span. Given the cover provided as 20mm, what is the effectivedepth along the longer span?

(a)174mm
(b) 163mm
(c)131mm
(d) 125mm

7 The acceptable limit for the safety and serviciability requirements before failure occurs is called _____

(A) Working stress method
(B) Ultimate Strength method
(C) Limit state method
(D) None of the above

8 The maximum distance between main steel in slab is limited to

(A) 3d , 300 mm
(B) 3d , 450 mm
(C) 5d , 300 mm
(D) 5d , 450 mm

9 If the permissible compressive stress for a concrete in bending is C N/mm 2 , the modular ratio is

a) 280/C

b) 280/3C

c) 230/2C

d) 280/C

10 The diameter of longitudinal bars of a column should never be less than _____

a) 6 mm

b) 8 mm

c) 10 mm

d) 12 mm

11 What is Load Factor?

a) ratio of working load to ultimate load

b) product of working load and ultimate load

c) product of working load and factor of safety

d) ratio of ultimate load to working load

12 What is the modular ratio to be used in the analysis of RC beams using working stress method if the grade of concrete is M20?

a) 12.67

b) 13.33

c) 6.764

d) 23.88

13 The minimum reinforcement using mild steel in slab should not be less than___.

a) 0.12

b) 0.45

c) 0.19

d) 0.15

14 In rectangular column minimum pitch for lateral ties is calculated by

a) 18 time diameter of longitudinal bar

b) 14 time diameter of longitudinal bar

c) 16 time diameter of longitudinal bar

d) 20 time diameter of longitudinal bar

15 12.Overall depth of beam is 500 mm ,with effective cover 50 mm then find effective depth of beam

(A) 550 mm

(B) 450 mm

(C) 460 mm

(D) 100 mm

16 Equation width of flange in T-beam

(A) bf=lo6+bw+6Df

(B) bf=lo12+bw+3Df

(C) bf=lo6+bw+3Df

(D) bf=lo12+bw+6Df

17 A common footing provided for two or more columns is known as _____

a) Continues footing

b) Combined footing

c) Cantilever footing

d) Eccentric footing

18 R.C.C. slab is designed as a two way slab when

(A) Slab is Cantilever
(B) Ratio of longer to shorter span is ≥ 2.0
(C) Ratio of longer to shorter span is < 2.0
(D) Slab is continuous over two opposite edges

19 The amount of reinforcement for main bars in a slab , is designed for

(A) Minimum bending moment
(B) Maximum bending moment
(C) Maximum shear force
(D) Minimum shear force

20 Maximum diameter of bar for RC slab having thickness D is restricted to

(A) D / 4
(B) D / 6
(C) D / 8
(D) D / 10

Q2. Solve any TWO questions mandatory **10 marks Each**

1 A T beam Floor system has 130mm thick slab supported on beams width of rib 295mm, effective depth 590 mm and tension 6-20mm diameter. The beam are spaced at 3m c/c. The beam has an effective span of 3.4m. Usng M20 & fe 41. Find MOR adopt LSM.

2 A rectangular beam of size 250x400mm deep effective is r/f with 3-16mm dia of grade fe 415.The shear force at the support is 60 kN. Design the shear reinforcement if the grade of concrete used is M20. Use 6mm or 8mm dia of vertical stirrups.

3 A simply supported beam of size (235mm width x 600mm overall depth)is reinforced with 4-12mm diameter find the safe UDL on beam in addition to itself weight, on a span of 4 m. Take clear Cover to the tension steel as 30mm(mild exposure) Adopt M20 concrete and Fe 415 steel USING WSM.

Q2. Solve any TWO questions mandatory **10 marks Each**

1 A simply supported one way slab of a public building has a clear span of 2.5m and is supported on beam 230mm wide. Design the slab LL 5 KN/m^2. Use M20 and Fe 415. Show reinforcement details. Carry out check for shear only.

2 Design a square footing for a short axially loaded column size (300x300mm) carrying 650KN working load. Use M20 concrete & Fe 415 steel. Safe bearing capacityof soil is 185 KN/m2. Sketch the reinforcement detail.

3 Design the reinforcement in a column of size 400 mm x 600 mm subjected to an axial load of 2000 kN under service dead load and live load. The column has an unsupported length of 4.0 m and effectively held in position and restrained against rotation in bothends. Use M 25 concrete and Fe 415 steel.