No. of Printed Pages : 4 170745-120745

Roll No.....

4th Sem.

Branch : Civil Engg. / Constr. Mgmt/Highway Engg.

Subject : Reinforced Concrete Design

Time : 3 Hrs. **M.M. : 100**

SECTION-A

Note : Multiple choice questions. All questions are compulsory. (10x1=10)

Q.1 The minimum compressive strength of 43 grade OPC cement is (CO-1)

a) 43 N/m^2 b) 43 kN/m^2

C) 43 N/mm^2 d) 43 kN/m^2

Q.2 The length of straight portion of a bar beyond the end of the hook, should be at least. (CO-3)

a) Five times the diameter

b) Six times the diameter

c) Seven times the diameter

d) Ten times the diameter

Q.3 The diagonal tension in concrete can be resisted by providing. (CO-3)

a) Shear reinforcement

b) Inclined tension reinforcement

c) Diagonal tension reinforcement

d) All of these

Q.4 _____ is that value of load which has a 95% probability of not being exceeded during the life of the structure. (CO-4)

a) Live load b) Dead Load

c) Characteristic Load d) All of these

Q.5 ___ reinforcement are provided parallel to shorter span in one way slab to resist the bending Moment due to transverse loads coming on the slabs. (CO-8)

a) Distribution Reinforcement

b) Ultimate Reinforcement

c) Main Reinforcement

d) None of these

Q.6 The minimum cover to reinforcement of a slab shall not be less than 15 mm. (CO-8)

a) True b) False

Q.7 The torsional steel is provided at_____in a two-way slab with corners held down. (CO-9)

a) Top Bottom b) Bottom

c) Middle d) Both top and bottom

Q.8 The shape of column should be (CO-10)

a) Rectangular b) Square

c) Circular d) Any of these

Q.9 The diameter of longitudinal bars of a column should never be less than. (CO-10)

a) 8mm b) 10mm

c) 12mm d) 16mm

Q.10 In concrete if the reinforcement wires are stretched after the concrete has hardened it is called. (CO-11)

a) Pre-tensioning b) Post-tesioning

c) Initial tensioning d) High tensioning

SECTION-B

Note : Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Coefficient of thermal expansion of concrete is same as that of_____. (CO-1)

Q.12 The water used while mixing should be free from any deleterious materials. (True/False) (CO-1)

Q.13 In M15, the average bond stress is _____ N/mm^2. (CO-3)

Q.14 The ____ factor for strength of materials is the factor by

which the characteristic strength of material is multiplied to get the design values for materials. (CO-4)

Q.15 The strength of the material below which not more than 5% of the test result are expected to fall is known as the _____ strength of material. (CO-4)

Q.16 The main reinforcement is provided in the direction of ____ span is one-way slab. (CO8)

Q.17 if I/b =2, then two-way slabs are provided. (True/False) (CO9)

Q.18 For positive BM main steel is provided at _____ of the slab. (CO9)

Q.19 Transverse reinforcement does not contribute to the strength of a column. (True/False) (CO-10)

Q.20 Pr-stressing _____ the deflection of the structures. (CO11)

SECTION-C

Note : Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Write the differences between WSM and LSM of design of concrete structures. (CO2)

Q.22 An RCC beam has an effective depth of 650 mm and a breadth of 300 mm. It contains 6 bars of 25 mm dia. Find whether the shear reinforcement is required for a factored shear force of 210kN. Use M20 concrete and Fe 415 steel. (CO3)

Q.23 Write the purposes of providing the shear reinforcement in beams. (CO5)

Q.24 Write a short note on lap length of bars. (As per LSM of design) (CO4)

Q.25 Write the assumptions taken into consideration for the design of limit state of collapse in flexure. (CO5)

Q.26 Write the difference between singly reinforced and doubly reinforced beams. (CO6)

Q.27 Find the ultimate moment of resistance of a rectangular beam 280mm x 550 mm. The Tension and compression

reinforcements provided at an effective cover of 50mm are 2450mm^2 and 400 mm^2 respectively. Use M30 concrete and fe500 steel. (CO6)

Q.28 Under which condition the doubly reinforced beams can be used. (CO7)

Q.29 Why sometimes inverted T-beams are provided? (CO7)

Q.30 Draw the cross-section of a T-beam and write the IS specification for the calculation of width of flange of T-beams. (CO7)

Q.31 Why the distribution steel is provided in slabs. (CO8)

Q.32 Calculate the ultimate bending moments for a slab of room size 4m x 5m with live load 4.10 kN/m^2. The comers are held down. Use M20 concrete and Fe 415 steel. (CO9)

Q.33 A reinforced concrete column of diameter 450 mm is reinforced with 6-20 mm f bars and held in position at both ends (but not restrained against rotation) having unsupported length of 3.75 m. Find the safe load the column can carry. Use M20 grade of concrete and Fe 415 steel. (CO10)

Q.34 Write down the different classifications of RCC column along with diagrams. (CO10)

Q.35 Write the advantages of pre-stressed concrete. (CO11)

SECTION-D

Note : Long Answer type question. Attempt any two questions. (2x10=20)

Q.36 Write the design steps for the design of singly reinforcement beams as per LSM of design. (CO5)

Q.37 Design a simply supported one way slab over a classroom of size 4mx8m. The slab is supported on 230mm thick masonry walls. The slab is subjected to a live load of 4kN/m2 and a surface finish of 1.25 kN/m^2. Use M20 concrete and Fe 415 steel. (Co8)

Q.38 Write the steps for the design of two-way slabs as per LSM of slab design. (CO 9)