

and Fe-415 grade steel, if the size of the column is 300mm x 300 mm.

Assume $e_{min} < 0.05D$ (CO10)

Q.32 Explain pre-tensioning method of pre-stressing. (CO11)

Q.33 Write a short note on loss in pre-stress explain any 3 causes briefly (CO11)

Q.34 Why tensile steel is provided at bottom of simply supported beam & top in cantilever beams? (CO5)

- Q.35 a) How will you classify slabs?
b) Why two way slabs are considered economical (CO9)

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 a) Explain types of beam section with help of strain diagrams (CO5, CO9)

b) Explain the theory & design of two way slab when the corners not held down.

Q.37 Design a simply supported rectangular beam with the following data clear span = 4.2 m & superimposed load = 6kN/m. Use M20 concrete & Fe-415 steel (CO6)

Q.38 Design a simply supported slab to cover a room with the following details (CO8)

Size of room = 4m x 8m

Bearing on walls = 230 mm

Live load = 4000 N/m²

Load surface finishing = 1000N/m²

Clear cover & end cover = 20 mm

Grade of concrete = M20

Grade of steel = Fe-415

(Note: Course outcome/CO is for office use only)

No. of Printed Pages : 4

170745/120745

Roll No.

4th Sem / Civil, Constr. Mgmt., Highway Engg. Subject:- Reinforced Concrete Design

Time : 3Hrs.

M.M. : 100

SECTION-A

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

Q.1 Minimum grade of concrete to be used in R.C.C works should not be less than (CO1)

- a) M10 b) M20
c) M15 d) M25

Q.2 In W.S.M factor of safety for concrete is (CO2)

- a) 1.0 b) 3.0
c) 2.0 d) 4.0

Q.3 Design values for material f_d are expressed as (CO3)

- a) $f_d = f \times g_m$ b) $f_d = g_m/f$
c) $f = f_d \times g_m$ d) $f_d = f/g_m$

Q.4 Shear reinforcement in beams may be provided as (CO4)

- a) vertical stirrups
b) bent up bar
c) combination of vertical stirrups & bent up bar
d) all of these

Q.5 Design compressive stress is taken as (CO5)

- a) $0.25 f_{ck}$ b) $0.45 f_{ck}$
c) $0.35 f_{ck}$ d) $0.55 f_{ck}$

Q.6 Maximum value for I/D ratio for cantilever beam is (CO6)

- a) 5 b) 10

- Q.7 c) 7 d) 20
In a slab floor system, the end beams are called (CO7)

a) T-beams b) L-beams
c) Flat-beams d) None of these

Q8 Shape of slab is (Co8)
a) square b) circular
c) rectangular d) all of these

Q.9 In two way slabs with corners held down, the torsion steel is provided at (CO9)
a) top b) middle
c) Bottom d) both a & b

Q.10 Minimum number of longitudinal bars required for circular column are (CO10)
a) 4 b) 8
c) 6 d) 12

SECTION-B

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

- Q.11 What are the different types of limit states? (CO2)

Q.12 On which factor the location of neutral axis (N.A.) depends? (CO3)

Q.13 Stirrups and bent up bars are provided in beams as shear reinforcement (True/False) (CO4)

Q.14 What is the formula to calculate depth of neutral axis? (CO5)

Q.15 In singly reinforced beam, main steel reinforcement is provided in _____ zone (CO6)

Q.16 Neutral axis always passes through flange of a T-beam (True/False) (CO7)

Q.17 Why slabs are generally safe in shear? (CO8)

Q.18 When the length of slab is _____ than twice its width it is known as two way slab. (CO9)

- Q.19 What is the purpose of designing column? (CO10)
Q.20 The major loss of pre- stress is caused due to _____ (CO11)

SECTION-C

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

- Q.21 Give advantages & disadvantages of R.C.C (CO1)

Q.22 Explain stress-strain curve for concrete (CO2)

Q.23 Explain (CO3)

 - a) lever arm
 - b) neutral axis how are they calculated?

Q.24 An RCC beam has an effective depth of 700 mm & a width of 300 mm. It contains 6 bars of 25mm dia. Use M25 concrete & Fe-415 steel. Check whether shear reinforcement is required for a shear force of 250 KN. (CO4)

Q.25 A singly reinforced beam of 250mm x 450mm (overall) is reinforced with steel bars of area 1300 mm^2 . Use M20 grade of concrete & Fe-415 steel. Calculate the ultimate moment of resistance of the beam section. (CO5)

Q.26 What are doubly reinforced beams? Why they are required? (CO6)

Q.27 What are T-beams? Explain its effective width of the flange and draw its detailed section. (CO7)

Q.28 Why distribution steel is provided in one way slab but not in two way slabs? (CO8)

Q.29 What are two way slabs? Draw its plan and section explaining types of reinforcement used in it (CO9)

Q.30 Explain the types of reinforcement used in columns (CO10)

Q.31 A short concrete column is reinforced with 4 bars of 20 mm diameter. Determine the ultimate load carrying capacity of the column. Using M20 grade of concrete