

No. of Printed Pages : 4
Roll No.

180751/030751/753

**5th Sem / Civil, Brick Tech., Constr. Mgmt., Civil Engg
(Spl Highway Engg)**

**Subject:- Reinforced Cement Concrete Design and
Drawings**

Time : 6Hrs.

M.M. : 150

SECTION-A

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

- Q.1 Unit weight of P.C.C is _____ KN/m³ (CO1)
a) 20 b) 22
c) 24 d) 26
- Q.2 Which method is referred as deterministic (CO1)
a) Wsm b) Lsm
c) both of these d) none of these
- Q.3 The reinforcement in RCC takes (CO2)
a) Tensile stresses b) Compressive stresses
c) shear stress d) torsional stress
- Q.4 The failure of concrete can occur due to (CO3)
a) Diagonal tension b) diagonal compression
c) tensile stress d) none of these
- Q.5 The maximum strain in concrete at the outermost compression fibre is taken as (CO4)
a) 0.002 b) 0.0035
c) 0.003 d) 0.0037
- Q.6 For mild exposure condition the nominal concrete cover shall not be less than (CO5)
a) 15 mm b) 20 mm
c) 25 mm d) 30 mm
- Q.7 In a slab floor system the end beams are called (CO6)
a) T beam b) L beam
c) P beam d) flat beam

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- Q.8 Distribution Steel in one way slab is provided (CO7)
a) To distribute the load
b) To take temperature stress
c) to take shrinkage stress
d) all of the above
- Q.9 Short column fail by (CO9)
a) Buckling b) Crushing
c) twisting d) bending
- Q.10 The minimum percentage of longitudinal steel in a column is (CO9)
a) 0.4 b) 0.8
c) 1.0 d) 1.2

SECTION-B

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

- Q.11 The unit weight of RCC is _____. (CO1)
- Q.12 Factor of safety For steel is _____. (CO2)
- Q.13 Higher the grade of concrete _____ will be the shear resistance. (CO3)
- Q.14 LSM is more economical (T/F) (CO4)
- Q.15 At neutral axes in a beam section stress is _____. (CO5)
- Q.16 Doubly reinforced beam are provided when the dimension of the beam are restricted _____. (CO6)
- Q.17 The portion of T-beam below the slab is called _____. (Co7)
- Q.18 The main reinforcement is providing along the span _____ one way slab. (CO8)
- Q.19 _____ column fail by buckling. (CO9)
- Q.20 Loss of pre-stress is more in _____. (CO10)

SECTION-C

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

- Q.21 What are the advantages of R.C.C over other construction material (any five) (CO1)

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- Q.22 What are the drawbacks of working stress method (any five) (CO2)
- Q.23 An R.C.C beam 300x600mm (effective) is reinforced with 6-25 mm dia. Longitudinal bars. It is subjected to a shear force 150KN. Find whether shear reinforcement is required for this beam using M20 grade concrete and Fe 415 steel. (CO3)
- Q.24 Write the assumption in limit state of collapse in flexure. (CO4)
- Q.25 Write the design steps for singly reinforced beam (CO5)
- Q.26 Explain the conditions in which we design a doubly reinforced beam. (CO6)
- Q.27 Draw a labeled figure to explain the various components of a T-beam. (CO7)
- Q.28 Enlist any five difference between one way slab and two way slab. (CO8)
- Q.29 Explain the classification of column according to slenderness ratio and according to line of action of load (CO9)
- Q.30 A hall has clear dimension of 4 x10m with wall thickness 230mm the live load on slab is 3.5kn/m² the finishing load is 1 KN/m² using M20 grade concrete and Fe 415 steel, design the slab. (Co10)
- Q.31 Give IS specification for the following
- reinforcement in slab
 - Spacing of reinforcement in slab (CO8)
- Q.32 Why main reinforcement is providing along shorter span in one way slab. (CO8)
- Q.33 What is the necessity to provide shear reinforcement. (CO4)
- Q.34 State the name of losses of prestresses. (CO11)
- Q.35 Enlist any five advantages of pre-stressed concrete over R.C.C. (CO11)

SECTION-D

- Note:** Long answer type questions. Attempt any two questions out of three questions. (2x10=20)
- Q.36 Briefly discuss the procedure of designing simply supported one way slab with I.S code Method. (CO8)
- Q.37 Design a short R.C.C column to carry an axial load of 1600 kN. It is 4 m long, effectively held in position and restrained

against rotation at both sides. Use M 20 concrete and Fe 415 steel. (CO10)

- Q.38 A double reinforced beam 230 mm x 500 mm effective is subjected to a factored moment of 200 Knm. Find the reinforced required. Use M 20 concrete Fe 415 Steel. (CO6)

SECTION-E

- Note:** Long answer questions. Attempt any two questions out of three questions. (2x25=50)
- Q.39 Draw sectional plan and sectional elevation of a simply supported one way slab with the following data (CO1)
- Size of room = 3.5mx7.5 m Thickness of wall= 500mm
Bearing of wall=300 mm
Thickness of slab= 150 mm
Reinforcement details of HYSD bars
Main bar=12 mm dia. @ 150 mm c/c Distribution steel = 10 mm dia @ 200 mm c/c
- Q.40 Draw the L-section and two cross section near support and mid span of a doubly reinforced beam from following data
- Size of beam=300mm x500 mm clear span = 4.5 mm
Bearing on wall=400 mm
Main tensile reinforcement = 3bar of 20 mm dia.(one bar bent up at 1/7)
Compression reinforcement = 2-16mm dia.
Shear stirrups =8mm dia. 2 legged @ 200 mm c/c
- Q.41 Draw sectional plan and sectional elevation of a square column with isolated footing of uniform thickness from the following data:
- Size of column =450mm x450 mm
depth below G.L = 12 m
plinth level = 300mm above G.L.
Height of ceiling above plinth level = 3.5m
Reinforcement details:
Column :
Main bar = 4-25mm dia. Lateral ties =8mm dia @ 300 mm c/c
Footing:
Size of footing = 2.2 m x 2.2 m Thickness of footing =300 mm
Reinforcement ; 12 mm dia bars @ 150 mm c/c both ways
Assume any other missing data and prepare BBS.