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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/m<sup>3</sup> (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 stafe 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 Writes 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/m<sup>2</sup> the finishing load is 1 KN/m<sup>2</sup> using M20 grade concrete and Fe 415 steel, design the slab. (Co10)  
 Q.31 Give IS specification for the following  
     a) reinforcement in slab  
     b) 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.