Total No. of Questions : 6]

SEAT No. :

PB88

[Total No. of Pages :2

[6269]-302

T.E. (Civil Engineering) (Insem)

DESIGN OF RC STRUCTURES

(2019 Pattern) (Semester-II) (301013)

Time : 1 ¼ Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6*
2) *Figures to the right indicate full marks.*
3) *Use of IS 456-2000 and non programmable calculator is allowed.*
4) *Neat diagrams must be drawn wherever necessary.*
5) *Mere reproduction from IS Code as answer, will not be given full credit.*
6) *Assume any other data, if necessary.*

Q1) a) Enlist various design philosophies/methods for design of RCC structures. Compare working stress method with limit state method. **[4]**

b) A beam of size 230mm × 412 mm effective depth is simply supported over a span of 5m. The reinforcement consists of 4 bars of 16mm diameter at tension face. Find intensity of uniformly distributed load (including self-weight) that can be carried by beam. Use M25 & Fe415. **[6]**

OR

Q2) a) Draw and explain stress-strain curves for concrete as per LSM. **[4]**

b) Calculate maximum safe superimposed load carried by beam of effective span 7.5m. The beam is detailed as below **[6]**

i) Width of rib = 300mm

ii) Effective flange width = 1200mm

iii) Thickness of flange = 130mm

iv) Effective depth = 565 mm

v) Tension steel = 5nos. of 25mm diameter

vi) M25 grade of concrete and Fe500 grade of steel

vii) Effective cover = 35mm

P.T.O.

Q3) a) Draw stress block diagrams with all parameters for the design of doubly reinforced RCC section of flexural member using LSM. **[2]**

b) Design cantilever slab using LSM approach for an effective span of 1.6m carrying live load of 3.0 kN/m^2 and floor finish of 1.5 kN/m^2. Use M25 & Fe 415. Draw the details of the reinforcement. **[8]**

OR

Q4) a) Enlist essential conditions to design beam section as flanged beam in floor beam system. **[2]**

b) A RC slab is to be provided for a passage measuring 3.2m × 7.5m with 230mm wide beams around all edges. Design the suitable slab assuming LL 3 kN/m^2 and FF 1.5 kN/m^2. Use M25 and Fe500. Assume moderate exposure condition. Show details of the reinforcement. **[8]**

Q5) Design a simply supported two way slab of effective spans 3.6m × 5.6m effective carrying L.L. of 3 kN/m^2 and F.F. of 1 .5 kN/m^2. Use M20 and Fe415 for mild exposure condition. Draw the details of the reinforcement. (Neglect design of distribution steel and check for shear) **[10]**

OR

Q6) Design a two way slab of effective spans 3.23m × 4.73m with two adjacent edges discontinuous. The slab is supported on beams of 230m width around all edges. Provide L.L. of 2.5kN/m^2 and F.F. of 1 kN/m^2. Use M30 and Fe500. Show the details of the reinforcement with neat and clean sketch. (Neglect design of distribution steel, torsion reinforcement and check for shear) **[10]**