

Total No. of Questions : 6]

SEAT No. :

PB88

[6269]-302

[Total No. of Pages :2

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 30 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 $3.2\text{m} \times 7.5\text{m}$ 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 $3.6\text{m} \times 5.6\text{m}$ 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 $3.23\text{m} \times 4.73\text{m}$ with two adjacent edges discontinuous. The slab is supported on beams of 230mm width around all edges. Provide L.L. of 2.5 kN/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]

