Total No. of Questions : 6]

SEAT No. :

PA-10032

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T.E. (Civil Engineering) (Insem)

DESIGN OF REINFORCED CONCRETE STRUCTURES

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

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q4, 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 reprodcution from IS Code as answer, will not be given full credit.***
6) ***Assume any other data, if necessary.***

Q1) a) Calculate neutral axis, lever arm and moment of resistance factor for M25 and Fe 550. **[4]**

b) Calculate moment of resistance for a section 300mm × 450mm deep. 3 bars of 20mm diameter provided on tension side only. Effective cover is 40mm, use M30 and FE 415. **[6]**

OR

Q2) a) Explain the terms bond stress and development length. Calculate development length for 20mm diameter bar of grade Fe500 and M30 grade of concrete in tension and compression using LSM. **[4]**

b) Explain with neat sketch Balanced, Under reinforced and Over reinforced section as per LSM. **[6]**

Q3) a) Enlist essential conditions to design beam section as flanged beam in floor beam system. **[2]**

b) Design a cantilever RC slab for an effective span of 1.5 m carrying live load of 3 kN/m^2 and floor finish of 1 kN/m^2. Use M20 grade of concrete and Fe 415 grade of steel. **[8]**

OR

P.T.O.

Q4) a) Explain Characteristic strength and Partial factor of safety. **[2]**

b) Design a simply supported one way slab for a room with clear inner size 3.5m × 7.8m. The slab is supported by beams of width 230mm along all the edges. The slab is subjected to floor finish of 1.5 kN/m^2 and live load 3kN/m^2. Use concrete of grade M20 and Fe500 reinforcement. Draw details of reinforcement. **[8]**

Q5) Design a simply supported two-way slab panel having effective dimensions as 4.23 m × 3.23 m. Take live load of 3.50 kN/m^2 and floor finish of 1kN/m^2. Use M20 grade of concrete and Fe 415 grade of steel. (Neglect design of distribution steel and check for shera) **[10]**

OR

Q6) Design of continuous two way slab of effective size 3.5 m × 5 m of a typing floor for an office building. The live load and floor finish are 3.0 kN/m^2 and 1.5 kN/m^2, respectively. The slab is discontinuous at two adjacent edges. Use M25 grade of concrete and Fe 500. (Neglect design of distribution steel, torsion reinforcement and check for shear). **[10]**