Total No. of Questions : 6] **SEAT No. :**

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TE/Insem/APR - 4
T.E. (Civil)
Structural Design - II
(2012 Pattern) (Semester - II)

Time : 1.30 Hours] ***[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 I.S.456-2000 and non programmable calculator is allowed***
4) ***Neat diagrams must be drawn wherever necessary***
5) ***Assume suitable data, if necessary***

Q1) a) Compare LSM with WSM from material behavior point of view **[5]**

b) Explain balanced, under reinforced and over reinforced section w.r.t. LSM **[5]**

OR

Q2) a) Derive the design constants used in LSM for M25and Fe 415 **[4]**

b) Design a cantilever beam for span of 2.5 m if it is subjected to UDL of 30 KN/m including self weight; assume width of beam as 230 mm Use M20 and Fe 415 WSM is recommended **[6]**

Q3) A RCC beam of size 230 mm x 450 mm is reinforced with 4 no's of 16 mm dia. Beam having effective span of 4.5 m and clear cover to reinforcement is 30 mm. calculate safe working UDL excluding the self weight the beam can carry using WSM and LSM , Use M20 and Fe 415 **[10]**

OR

P.T.O.

Q4) For an assembly hall 16 m × 7.5 m floor beams are spaced at 4 m and have a simply supported span of 7.5 m , these beams support a floor slab of 110 mm thick the size of beam is 230mm × 650 mm overall , Design the intermediate flanged section for flexure only using LSM Refer data given below **[10]**

a) Live load on slab = 3.5 KN/m^2

b) Floor finish = 1.5 KN/m^2

c) Wall on beam = 230 mm thick and 3.0 m height

d) Effective cover = 50 mm

e) Material- M25 and Fe500

Q5) Design a corridor slab over a passage 3 m × 7 m at the entrance of a public building, the slab is supported by 230 mm wide beams and carries a live load of 3KN/m^2 and F.F of 1.5 KN/m^2 use M20 and Fe 500 design for flexure, shear and development length and show details of reinforcement **[10]**

OR

Q6) Design the first flight of a dog-legged staircase for the following data **[10]**

a) Centre line dimension of staircase room - 2.0 m × 4.75 m

b) Floor to floor height = 3.0 m

c) Rise = 150 mm Tread =300 mm

d) Width of landing = 1 m

e) Type of building – Residential with F.F.1.5 KN/m^2

f) Material – M25 and Fe415

g) Draw details of reinforcement

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