APR - 15/ENGG.-104
T.E. (Civil) (In Sem - Semester - II)
STRUCTURAL DESIGN - II
(2012 Pattern)

Time : 1½ 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 of IS - 456-2000 and non-programmable calculator is allowed.
4) Neat diagram must be drawn wherever necessary.
5) Assume suitable data, if necessary.

Q1) a) Explain in short Various Design Philosophies for Design of R.C.C Structures. **[5]**

b) Compare L.S.M with W.S.M from consideration of material behavior. **[5]**

OR

Q2) a) What is Purpose of Partial safety factors used in LSM? Why they are called Partial? Give partial safety factors for stresses in steel and concrete? **[5]**

b) Derive the design constants used in LSM for M25 and Fe 500. **[5]**

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

OR

P.T.O.

Q4) a) What do you mean by doubly reinforced section? Under what circumstances they are used? **[4]**

b) Find the factored M.R of R.C.C beam 300 × 450 mm effective if it is reinforced with 4 no's of 25 mm Φ in tension zone and 2 no's of 20 mm Φ in compression zone placed at effective cover of 50 mm from top., use M20 and Fe415. **[6]**

Q5) A simply supported one way slab is to be designed for an effective span of 3.5 m, the superimposed load including finishing is 5 kN/Sq.m, assuming M F = 1.3 Design the Slab and draw the sectional elevation showing details of reinforcement. **[10]**

OR

Q6) Design the first flight of a dog legged staircase of residential building with following data **[10]**

i) Floor to floor height -3.3 m

ii) Rise = 150 mm, Tread = 300 mm

iii) Width of landing = 1.25 m

iv) Material M20 and Fe415

v) Assume suitable data if required

vi) Draw details of reinforcement

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