Total No. of Questions : 8]

SEAT No. :

P4417

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[4860]-1034

M.E. (Civil) (Structures)

ADVANCED DESIGN OF CONCRETE STRUCTURES

(2013 Credit Pattern) (Semester -II)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***Answer any five questions.***
2) ***Answers should be written in same book.***
3) ***Figures to the right indicate full marks.***
4) ***Use of IS 456, IS 1343, IS 1893, IS 3370 & non programmable calculator is allowed.***
5) ***Neat diagrams must be drawn wherever necessary.***
6) ***Assume any other data if necessary.***

Q1) a) Write short note with sketches on Characteristics of yield lines. **[4]**

b) Draw yield line patterns for the following **[6]**

i) Rectangular slab with fixed at supports on three sides with shorter side simply supported.

ii) Equilateral triangular slab fixed at two sides , unsupported at third side.

Q2) Design a RCC slab for a square hall of clear dimensions 5× 5m using Yield Line Theory. Assume the peripheral support thickness 300mm, the slab is simply supported. Use M25 Fe 500 take Live load = 4.5 kN/m^2 & floor finish load = 1.5 kN/m^2 . Draw details of reinforcement. **[10]**

Q3) Design a grid slab for a floor of hall 10.5 × 13.5 m c/c having square grid of 1.5m . Use M 20 Fe500 take Live load = 5 kN/m^2 & floor finish load = 1.5 kN/m^2. Apply the required check & draw reinforcement details. **[10]**

Q4) Design a flat slab for a hall with column spacing 6m ×6m c/c the size of the column diameter is 500mm each. Use M20 Fe500 take Live load = 4.5 kN/m^2 & floor finish load = 0.9 kN/m^2 . Draw details of reinforcement. **[10]**

P.T.O.

Q5) Design a staging for circular type ESR for 2.0 lakh liters with staging height 9m using M25, Fe500 in earthquake zone lll. Safe bearing capacity is 200kN/m^2.Design of Container is not required. Assume approx dimension of container, wall, top, bottom slab thickness, beams sizes & number of columns. Design must include calculations of vertical loads and horizontal force calculations. Design the bracings and columns . Draw the reinforcement details.

[10]

Q6) Design a circular bunker to store 50 tonnes of coal for the following. Density of cement = 16 kN/m^2, Angle of repose = 29°. Use M25 & TMT steel. Draw the details of reinforcement in side wall and hopper. **[10]**

Q7) Design Raft foundation for the following **[10]**

Centre to centre distance of column in both directions = 2.4m, Column size = 300 × 300mm, working axial load on each column = 600kN. The depth of the strata = 1.8m. Use M25 & Fe500. The safe bearing capacity of the strata = 90 kN/m^2. Show all Analysis and Design calculations & draw the reinforcement details.

Q8) a) Write detailed note on flanged shear wall. **[5]**

b) Write detailed note on design of formwork for box girder. **[5]**

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