

Total No. of Questions : 4]

SEAT No. :

P8915

[Total No. of Pages : 2

Oct-22/BE/Insem-30

B.E. (Civil)

ADVANCED DESIGN OF CONCRETE STRUCTURES
(2019 Pattern) (Semester - VII) (401 003b) (Elective-III)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates :

- 1) *Answer Q.1 or Q.2, Q.3 or Q.4.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of non programmable electronic calculator is allowed.*
- 5) *Assume suitable data, if necessary.*
- 6) *Assessment will be based on complete solution and not on final answer.*
- 7) *Is 456: 2000 is allowed in the examination.*

- Q1)** a) Explain with neat sketches the direct design method for fiat slabs. [5]
- b) A flat slab system consists of 5 m x 6 m panels without drop and column head. It has to carry a live load of 3.5 kN/ m² and a finishing load of 1 kN/m². It is to be designed using M20 grade concrete and Fe 500 steel. The size of the columns supporting the system is 500 x 500 mm and floor to floor height is 4.5 m. Calculate design moments in interior and exterior panels at column and middle strips in both directions. Design for flexure and draw the typical detailing of slab. [10]

OR

- Q2)** a) What are flat slabs and what are their advantages? [3]
- b) Design the interior panel of a flat slab of size 5m x 5m with a suitable drop. The size of the columns are 500 x 500 mm and the live load on the panel is 4 kN/m² and floor finish is 1kN/m². Use M20 grade of concrete and Fe 500 steel. Draw the reinforcement details. [12]

P.T.O.

- Q3)** a) Explain the philosophy of yield line theory for the analysis of slabs. [5]
- b) Draw yield lines for the following cases : [5]
- i) Right angled triangular slab fixed along two adjacent sides making right angle and unsupported along the third side.
 - ii) Rectangular slab with fixed supports on two adjacent sides with remaining longer side simply supported and shorter side unsupported.
- c) Explain virtual work method for obtaining the ultimate load for a simply supported square slab subjected to a uniformly distributed load. [5]

OR

- Q4)** a) Using the yield line theory, derive the expression for ultimate load for an equilateral triangular isotropic slab simply supported on all three edges.[7]
- b) Using the yield line theory, derive the expression for ultimate load and design a simply supported circular slab of 2.75 m diameter subjected to uniformly distributed load of 3 kN/m^2 . [8]

