A

06CE6017/06CE6011 **Reg. No _____**

Name _____

A P J ABDUL KALAM TECHNOLOGICAL UNIVERSITY

M.TECH DEGREEEXAMINATION, DECEMBER 2016

FIRST SEMESTER

Branch: Structural Engineering and Construction Management/Computer Aided Structural Engineering

ADVANCED STRUCTURAL DESIGN

Any data, if required may be suitably assumed and clearly indicated. Use of relevant codes are permitted

Time: 3 Hours **Max. Marks: 60**

PART A

Answer ALL questions

1. State the assumptions of yield line theory.
2. What is the function of (i) Drop panel and (ii) Column capital in the flat slab?
3. Explain with figure the flow of inertia forces in structures.
4. Explain the behavior of beam – column joints during earthquakes

(4 x 5 marks =20 marks)

PART B

5. Derive the expression for ultimate moment of an isosceles right triangular slab isotropically reinforced carrying a uniform area load using virtual work method. The slab is free at the longer edge and simply supported at the other 2 equal edges.

OR

6. Design a reinforced rectangular grid floor of a conference room 12m x 16m. with the centre to centre spacing of ribs at 2m. Both ways. Assume the slab thickness is 100 mm, total load including self weight is 6.5 kN/m^2. Use M 20 grade of concrete and Fe 415 steel. Assume the grid floor is simply supported on all the four sides. Also sketch the reinforcement details.

7. Design and detail the interior panel of a single storey flat slab system. Typical panel size is 7.5 m. x 6m. column size 300 x 500 mm. Live load is 4 kN/m^2. Provide suitable drops. Use M25 concrete and Fe 415.

OR

8. Design a continuous beam with 3 equal clear spans of 8m. The characteristic dead load is 10kN/m and characteristic live load is 15kN/m. Design the critical sections of the beam & sketch the reinforcement details using limit state method and allowing 15% redistribution. Adopt M20 grade concrete & Fe 415 steel.
9. How the building configurations affect the effects of earthquakes?

OR

10. a. Explain strong column – weak beam approach in earthquake resistant design of RCC framed building and its implications. **(5 marks)**

    b. A building having non- uniform distribution of mass as shown in fig.1. Locate its centre of mass. **(5 marks)**

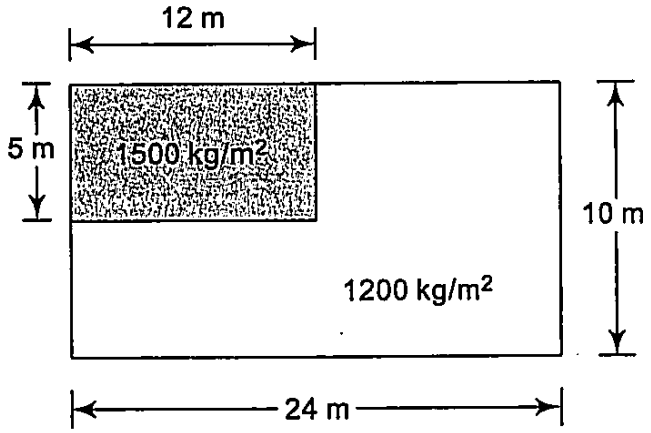

Fig.1

11. Briefly describe the retrofitting techniques for RC buildings.

OR

12. Write Short notes on :
    a. Mechanical dampers for buildings
    b. Base isolation techniques.

(4 x 10 marks =40 marks)