

**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)  
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**M.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018**Subject: Theory of PlatesBranch/Specialization: **CE/Structural Engg.**

Time: 3 hours

Max. Marks: 60

**PART – A**

Answer ALL questions of the following

5x4Mark=20 Marks

- 1 Distinguish between thin plates and thick plates. (4)
- 2 What are the assumptions made in the small deflections of laterally loaded plates? (4)
- 3 Write down the expressions for  $M_r$  and  $M_t$  for a uniformly loaded circular plate with simply supported edges. (4)
- 4 Give any two practical examples of plates resting on an elastic foundation. (4)
- 5 Briefly explain FDM. (4)

**PART-B**

Answer ALL questions of the following

5x 8 Marks= 40 Marks

- 1 Derive an expression for the deflection of a uniformly loaded long rectangular plate with fixed edges under cylindrical bending. (8)  
(OR)
- 2 Define Pure bending and Obtain the relation between curvature and bending moment in pure bending of plates. (8)
- 3 Derive an expression for bending moments in a simply supported rectangular plate under hydrostatic pressure using Levy's solution. (8)  
(OR)
- 4 Discuss the Navier's solution for simply supported rectangular plates when the loading function is expressed in the form of a double sine series. (8)
- 5 Derive an expression for deflection of a simply supported circular plate of radius "a" with a circular hole of radius "b" subjected to shear force Q uniformly distributed along the inner edge of the hole. (8)  
(OR)
- 6 What are Orthotropic plates? Derive the governing differential equation for the Orthotropic plates. (8)
- 7 Discuss the Levy type solution for the deflection of a uniformly loaded simply supported rectangular plate on elastic foundation. (8)  
(OR)
- 8 Derive an expression for deflection of a large simply supported rectangular plate resting on elastic foundation. The plate is loaded at equidistant points along the X-axis by concentrated forces "P". (8)
- 9 Obtain an expression for buckling of rectangular plates axially loaded in two directions. (8)  
(OR)
- 10 A square plate of side "a" fixed at the edges is subjected to a u.d.l. of intensity "q". Obtain the central deflection using Finite Difference Method. Divide the plate into 16 equal squares. (8)