

Code No: 5220AB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**M.Tech I Semester Examinations, February - 2017****THEORY OF PLATES****(Structural Engineering)****Time: 3hrs****Max.Marks:75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**5 × 5 Marks = 25**

1. a) Classify different types of plates. [5]
- b) Differentiate between Navier and Levi's solutions to plate problems. [5]
- c) How are orthotropic plates different from isotropic plates? [5]
- d) How do boundary conditions help in determining solution of plates on elastic foundations? Illustrate with an example. [5]
- e) Enumerate finite difference approach to plate problems. [5]

PART - B**5 × 10 Marks = 50**

2. A simply supported rectangular plate is subjected to a uniformly distributed load q . Calculate maximum stress. [10]

OR

3. How does the Galarkin method is applied to obtain plate deflection for simple loading. Discuss in detail with an example. [10]

4. A simply supported rectangular plate of size $a \times b$ is under hydrostatic pressure. Obtain maximum deflection of the plate. [10]

OR

5. What is the significance of Lagrange's equation? Derive Lagrange's differential equation for rectangular plates. [10]

6. A circular plate with a hole is subjected to uniform bending force distributed along its inner edge. Determine general deflection equation for the plate. [10]

OR

7. Derive the governing differential equation for an orthotropic plate. [10]

8. Using Navier solution, obtain deflection of a rectangular plate resting on elastic foundation. [10]

OR

9. A long plate is carrying rows of equidistant columns. Obtain deflection of the plate. [10]

10. Obtain differential equation for a plate subjected to in plane bending and simultaneous stretching of plate. [10]

OR

11. Determine buckling of a simply supported rectangular plate when the compressive forces acting in one direction in the middle plane of the plate. [10]