

Code No: C2003

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.Tech I - Semester Examinations, March/April-2011

THEORY AND ANALYSIS OF PLATES

(STRUCTURAL ENGINEERING)

Time: 3hours

Max. Marks: 60

Answer any five questions
All questions carry equal marks

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1. A thin long narrow rectangle plate of thickness "h", flexural rigidity "D" is subjected to a u.d.l. of intensity "w". If it is a fixed along the longer edge, obtain the general expression for the deflection & B.M. Also find their maximum values. [12]
2. By establishing equilibrium of an elemental area in a circular plate derive the differential equation of equilibrium for bending of thin circular plate hence obtained deflection of a circular plate with a hole at centre bending under moments M1 and M2 uniformly distributed along their inner and outer boundaries. [12]
3. A rectangular plate a, x, b, simply supported at the edges is subjected to a sinusoidal loading. Using the Navier's solution, obtain the general expressions for deflection & B.M. Also find their maximum value. [12]
4. For a simply supported rectangular plate subjected to a hydrostatic pressure on the entire span, obtain deflections and moments in the plate using LEVY's solution. [12]
5. Find out the maximum deflection for a fixed rectangular plate of size a x b subjected to a uniform load of intensity "w" using Ritz method. [12]
6. Write down the governing differential equations for solving the plate bulking problem for a simply supported rectangular plate. Obtain the expressions for critical stress in case of one direction bulking. [12]
7. Obtain Ritz solution based on strain energy formulation for the deflection behavior of thin plates. [12]
8. Formulate the problems of building behavior of plates resting on elastic foundation and hence analyze the behavior of mat four later. [12]
