JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATION- JUNE -2016

B.Tech8th Sem/ M.Tech 2nd Semester

COURSE CODE: 12M1WCE214   MAX. MARKS: **35**

COURSE NAME: THEORY OF PLATES AND SHELLS

COURSE CREDITS: 03   MAX. TIME: **2 HRS**

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q1. Deduce the differential equation to find deflection, bending moments and shear force for a simply supported rectangular plate under sinusoidal loading. **(5)**

Q2. For a thin cylindrical vessel compute volumetric strain in terms of P, D, t, and μ **(5)**

Q3. A thin cylindrical pressure vessel of diameter 2.5m and thickness 18mm is subjected to an internal pressure 1.2N/mm^2. In addition the vessel is also subjected to an axial tensile load of 2800kN. Determine the normal and shear stresses on a plane at an angle of 60^0 to the axis of the vessel. Find also the maximum shear stress. **(5)**

Q4. Deduce the equation of a circular plate with a hole at the centre **(5)**

Q5. With the help of Mohr's circle find the equations of principal curvature and principal planes in case of pure bending of plates. **(5)**

Q6. A steel tube having outside and inside diameters of 45mm and 40mm is firmly plugged at both ends, leaving an internal length of 250mm between the flat ends of the plugs. The plugs are designed so that water can be admitted to the inner space and also so that an axial pull can be applied to the tube. If the tube is subjected to an axial pull of 40kN and in addition is filled with water at a gauge pressure of 1.75N/mm^2, find the volume of water which will escape from the tube if the axial pull is removed and inner space is opened to the atmosphere. E=2×10^5 N/mm^2 μ= 0.286 K for water =2000N/mm^2 **(5)**

Q7. Find the relation between bending moments and curvature in case of pure bending of plates

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