Roll No ....

MVSE-205

M.E/M.Tech II Semester

Examination, December 2015

Theory of Plates and Shells

Time : Three Hours

Maximum Marks: 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.
iii) Assume missing data suitably.

1. a) Write the various assumptions made in thin plates with small deflections?

   b) Derive the moment curvature relationship in the case of pure bending of plates.

2. A circular plate of radius 'a' with simply supported edges carries a load of intensity 'q' uniformly distributed over the entire surface of the plate. Derivation the expression for the maximum deflection of plate.

3. A simply supported rectangular plate of dimension a×b×h is subjected to load 'P' acting over an area uv. Derive the expression for deflection. Adopt Navier's approach.

4. a) Discuss the general theory of cylindrical shell loaded symmetrically with respect to its axis.

   b) Compare membrane theory and bending theory of cylindrical shell in details.

5. If a simply supported rectangular plate of size (a×b) is subjected to sinusoidal load distributed over the surface of the plate is given by expression.

$$q = q_0 \sin\frac{\pi x}{a} \sin\frac{\pi y}{b}$$

Where q_0 represents the intensity of the load at the centre of the plate. Then formulate expression for maximum deflection and maximum bending moment.

6. Discuss the membrane theory of density curved shells and thus obtain the expression for membrane force along meridional and circumferential directions.

7. If a square plate of size (a×a) with two opposite edges simply supported and the other two edges clamped is subjected to a u.d.l of intensity q. Find the expression for deflection at the centre.

8. Write short notes on any four of the following:

   a) Gaussian curvature

   b) Fourier loadings

   c) Hyperbolic - parabolic shells

   d) Boundary conditions

   e) Use of infinite integrals and transforms.

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