

Roll No .....

**MVSE-205**

**M.E./M.Tech. II Semester**

Examination, December 2016

**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) Derive the moment curvature relationship in case of pure bending of plates. 7  
 b) Derive the equations of equilibrium for small deflections of laterally loaded plates. 7
2. a) State various boundary conditions and solutions. 7  
 b) Derive expressions for stress acting on a plate inclined to x and y-axis. 7
3. A simply supported rectangular plate of dimension  $a \times b \times h$  is subjected to load "p" acting over an area uv. Derive the expression for deflection. Adopt Navier's approach. 14
4. Find Levy's solution for simply supported and uniformly loaded rectangular plates. 14
5. a) Discuss the general theory of cylindrical shell loaded symmetrically with respect to its axis. 7

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- b) Compare membrane theory and bending theory of cylindrical shell in details. 7
6. Derive equations for shear stress distribution and deflection of circular plates clamped at its circumference, state the assumptions. 14
7. a) Explain the classification and applications of folded plates. 7  
 b) Enlist special and approximate methods of theory of plates and explain any one in detail. 7
8. Write short notes on any four of the following:  $4 \times 3\frac{1}{2} = 14$ 
  - a) Gaussian curvature
  - b) Classification of shells
  - c) Fourier loadings
  - d) Use of infinite integrals and transforms
  - e) Continuous rectangular plates
  - f) Shells forming surface of revolution

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