Total No. of Questions : 8]

SEAT No. :

P4018

[Total No. of Pages : 2

[5255] - 515
M.E. (Civil) (Structure Engg.)
THEORY OF PLATES AND SHELLS
(2013 Credit Course) (Semester - II)

Time : 3 Hours] *[Max. Marks :50*

Instructions to the candidates:

1) ***Attempt any five questions from the following.***
2) ***Neat diagram must be drawn wherever necessary.***
3) ***Figure to the right indicates full marks.***
4) ***Assume suitable data, if necessary and clearly state.***
5) ***Use of cell phone is prohibited in the examination hall.***
6) ***Use of electronic pocket calculator is allowed.***

Q1) a) Differentiate between thin plate theories for small and large def1ections. **[4]**

b) For isotropic plates, under the action of lateral loading determine the stress-strain relations and hence the moment curvature relations in Cartesian coordinate system. **[6]**

Q2) a) Derive an expression of flexural rigidity for thin plate. **[2]**

b) A rectangular plate of size a x b with four edges simply supported carries a concentrated load at any point on the plate. Derive the expression for the deflection of the plate. **[8]**

Q3) a) Describe the stepwise procedure in the Levy's method for thin plate bending analysis. Apply these steps to obtain the maximum deflection in a square plate subjected to uniformly distributed load of intensity q per unit area. **[8]**

b) Explain in brief Reissener-Mindlin Theory **[2]**

Q4) a) A simply supported circular plate of radius a carries uniform loading of intensity q. Find the maximum values of deflection and expression for radial moment. **[8]**

b) State the boundary condition for the analysis of circular plate. **[2]**

P.T.O.

Q5) a) Explain in detail the classification of thin shells and explain the assumptions made in the theory of thin elastic shell. **[4]**

b) Derive the equations of equilibrium of shell of revolutions with axisymmetric loading. **[6]**

Q6) a) Explain membrane theory and derive equilibrium equation for circular cylindrical shell. **[6]**

b) State and explain boundary conditions for circular cylindrical shells. **[4]**

Q7) A horizontal cylindrical shell closed at both ends is filled with water and is simply supported at ends. Derive the stress resultants along any meridian in the shell. **[10]**

Q8) Explain the beam method of analysis of cylindrical shells. Discuss the advantages and limitations of the Lundgren's beam theory for cylindrical shells. **[10]**