Seat No: _____ **Enrollment No: _____**

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

M.Tech. Summer 2017 - 18 Examination

Semester: 2 **Date: 25/05/2018**
Subject Code: 03209155 **Time: 02:00 pm to 04:30 pm**
Subject Name: Theory of Plates and Shells **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 A) Define plate. Write the assumptions made in thin plate with small deflection theory. **(05)**

B) Briefly explain classification of shells based on properties of curvatures. **(05)**

C) Define shells and explain the difference between plates and shells in terms of structural superiority. **(05)**

Q.2 **Answer the following questions**. (Attempt any three) **(15)**

A) Derive the expression for strains in plate in terms of displacement 'w'.

B) Write a short note on structural behavior of folded plates.

C) List out the advantages and disadvantages of shells and briefly comment on shell structures.

D) Write short notes on following:

i. Shells of revolution and Shells of translation
ii. Thick shell and thin shell
iii. Synclastic shell and anticlastic shell

Q.3 A) Derive the Lagrange equation of equilibrium for plates under lateral loading having small deformations. **(07)**

B) Using membrane theory derive the equilibrium equations for shells of revolutions. **(08)**

OR

B) State the difference between

i. Navier's solution and Levy's solution
ii. Beam and plate

(08)

Q.4 A) Analyse rectangular plate subjected to uniformly distributed load using Levy's method. **(07)**

OR

A) Derive the force displacement equations for cylindrical shells. **(07)**

B) Obtain stress-strain relations for pure bending of plate in terms of displacement 'w'. **(08)**