

Code No: D2003

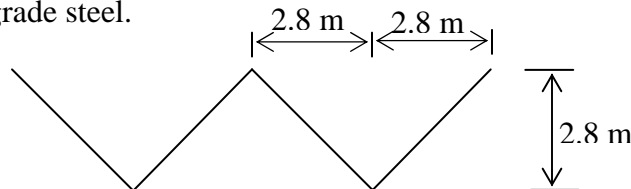
**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH II - SEMESTER EXAMINATIONS, APRIL/MAY 2012
ANALYSIS AND DESIGN OF SHELLS AND FOLDED PLATES
(STRUCTURAL ENGINEERING)**

Time: 3hours**Max. Marks: 60**

**Answer any five questions
All questions carry equal marks**

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- 1.a) What do you mean by 'Shells of Revolution' and 'Shells of Translation'? Explain them with neat sketches.
- b) Proceeding from the equilibrium equations, arrive at the general expressions for the membrane stress resultants in the case of circular cylindrical shell. Hence obtain the stress resultants under dead and snow loads for 'Fourier loading'.
2. Derive DKJ Characteristic equation from first principles.
- 3.a) Mention the various advantages in beam theory of cylindrical shells.
- b) Obtain the equations for finding out stresses in elliptical paraboloids.
4. Design a hyper shell roof of inverted umbrella type to suit the following data:
Area covered in plan = 28 m x 28 m; Use M30 concrete and Fe500 grade steel.
Sketch the details of reinforcement in the shell and edge beam.
5. Analyze a parabolic Conoid of type I for a span of 36 m. Chord width is 50 m. The rise at the tie end is 12 m. Thickness of the shell is 10 mm. Live load may be ignored.
- 6.a) Explain the structural behaviour of folded plates with neat sketches.
- b) What are the assumptions made in the analysis of folded plates?
- c) Write a short note on Continuous folded plates.
7. Find out the stresses and moments for a symmetrical V-shaped folded plate as shown below for the following data using Simpson's method. (Neglect plate rotations).
Span = 27 m; Thickness = 110 mm; Live load = 0.9 kN/m². Adopt M35 concrete and Fe415 grade steel.



8. Write short notes on the following:
 - i) Pre-stressed continuous folded plates.
 - ii) Long and short shells.
 - iii) Different forms of Hyperbolic Paraboloid.
 - iv) A cooling tower shell.
