Total No. of Questions : 8]

SEAT No. :

P5065

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[5060]-543

M.E.(Civil - Structures)

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 thin and thick plates. **[2]**

b) Derive Governing differential equation in cartesian co-ordinates with usual notation. **[8]**

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

b) A rectangular plate of size $a \times b$ with four edges simply supported carries a patch load on (u x v) of intensity q_0/m^2. Derive an expression for the deflection of the plate using Navier's method. **[8]**

Q3) a) Derive an expression for maximum deflection of the rectangular plate with two opposite edges simply supported subjected to uniformly distributed load by Lavy's method. **[8]**

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

Q4) a) Develop from first principle, governing differential equation for a circular plate under axisymmetric loading. **[8]**

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

Q5) a) State and explain in brief assumption of thin plate with small deflection. **[4]**

b) Derive an expression of equilibrium equations for cylindrical shell using bending theory. **[6]**

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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) Explain in brief application bending theory to pipes and pressure vessels. **[5]**

b) Explain the needs of bending theory for the analysis of cylindrical shells and expression for strains. **[5]**

Q8) a) State and explain beam theory of cylindrical shells and principle of Lundgren's beam theory. **[5]**

b) Explain in brief application of beam theory to arch analysis. **[5]**