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Total No. of Questions : 08

M.Tech. (Civil Engineering) (2016 Onwards) (Sem.–1)

THEORY AND DESIGN OF PLATES AND GRIDS

Subject Code : CE-503

M.Code : 35204

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWENTY marks.

1. a) Describe the classifications of plates and assumptions made in the analysis of thin plates with small deflections. (10)

   b) Derive the 4th order differential equation for the defected surface of laterally loaded rectangular plates. (10)

2. a) Explain the general theories of plates with neat sketches of bending shapes of plates. (12)

   b) What are the different types of boundary conditions? Explain in detail. (8)

3. a) For thin rectangular plate in pure bending, establish the relationship between the bending moment acting on the edges parallel to x and y axes and curvature. Also obtain the relationship between the bending moment, curvature and twisting moment. Twist of the surface on a plane parallel to z-axis and inclined to x and y axis. (12)

   b) Write short note on “Structural behaviors of folded plates”. (8)

4. Write a note on “Application of the Navier’s solution” and “Analysis of Grids”. (20)

5. a) Use Levy’s method to find central defection of a simply supported 25mm thick steel plate 4m × 5m. If it is loaded by a uniformly distributed load of 3kN/m2. (10)

   b) Derive the differential equation for the defected surface of a circular plate with circular hole at the centre part. (10)

6. Explain the various methods of analyzing grids for roofs and steel bridges. (20)

7. Discuss the procedure to “Distribution of concentrated loads to various beams of grid floors and bridge decks”. (20)

8. a) A thin circular plate of radius “R” is simply supported along r = R. It is subjected to uniformly distributed radial moment M around the rim. Find the defection of the plate at r = – 0. (10)

b) For a square plate of side 2.5m, under uniformly distributed load of 12kN/m2. Find the maximum deflection taking □□□ 0.4, E = 200kN/mm2, thickness of plate = 85mm. Take only the first term of the series. Adopt Navier’s solution also obtain the maximum deflection by Levy’s solution, taking only the first term of the series. (10)

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.