JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-2 EXAMINATIONS-2022

M.Tech.–II Semester (Structural Engineering)

COURSE CODE (CREDITS): 12M1WCE214 (3)   MAX. MARKS: 25
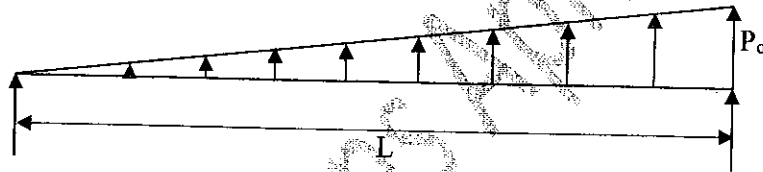
COURSE NAME: Theory of Plates and Shells

COURSE INSTRUCTORS: Sugandha Singh   MAX. TIME: 1 Hour 30 Min

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

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1. Derive the Fourier series function for the following load on a thin plate undergoing cylindrical bending. [10]

2. Assuming Po = 100 KN/m and L = 15m, find the following for the thin plate subjected to loading in question 1 (take first five terms from the Fourier series): [10]
   a. Equation for deflection of middle surface. Point and value of maximum deflection of the middle surface. (3)
   b. Maximum displacement in x direction. (2)
   c. Maximum strain in x direction. (2)
   d. Maximum moment in x direction about x axis. (2)
   e. Maximum stress on yz–plane in x direction. (1)
3. Following the displacement-based method, list the assumptions for development of thin plate theory. Also list the contradictions arising due to the assumptions. [5]