9/12/25
09:30AM

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2025

B.Tech-V Semester (CE)

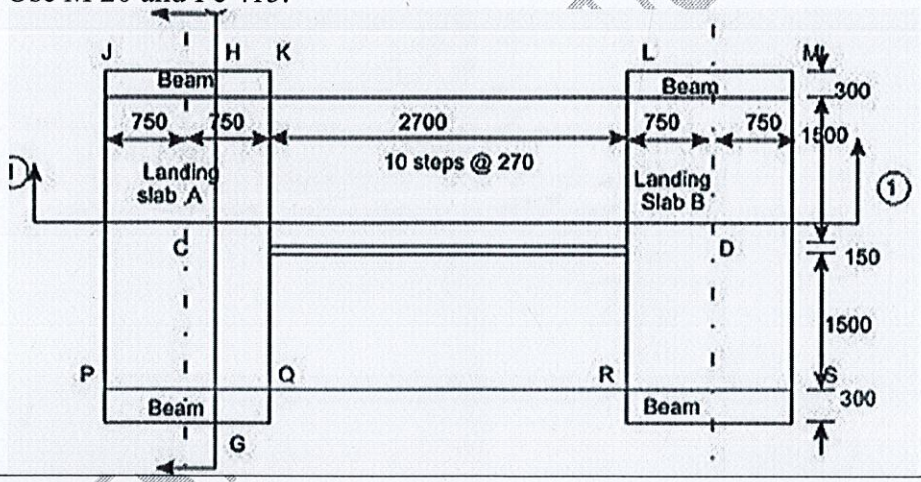
COURSE CODE (CREDITS): 18B11CE515 (4) MAX. MARKS: 35

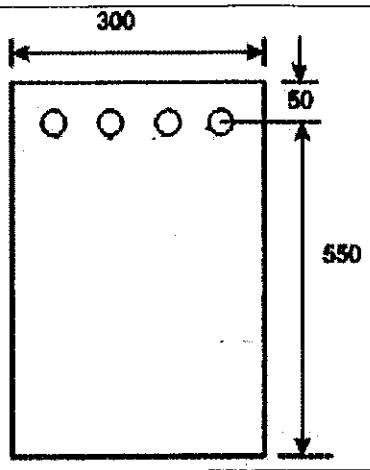
COURSE NAME: DESIGN OF CONCRETE STRUCTURES

COURSE INSTRUCTORS: Dr. Tanmay Gupta MAX. TIME: 2 Hours

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems. Use of scientific calculator and IS 456 is allowed.

Q.No	Question	CO	Marks
Q1	Design a trade-riser staircase shown below spanning longitudinally. Landing slabs are supported on beams spanning transversely. The dimensions of riser and trade are 160 mm and 270 mm, respectively. The finish loads and live loads are 1 kN/m^2 and 5 kN/m^2, respectively. Use M 20 and Fe 415. 	4	9
Q2	Explain the assumptions (do necessary derivation with neat figure) of determining the strain distribution lines in a column subjected to axial force and biaxial bending.	2	5
Q3	Explain the provisions of torsional reinforcing bars in restrained type of two-way slabs with neat diagram.	2	4
Q4	(a) Check the preliminary dimensions of a singly reinforced rectangular cantilever beam of span 4 m using M 20 and Fe 415. (b) Determine the tensile steel of the cantilever beam of subjected to service-imposed load of 11.5 kN/m using M 20 and Fe 415. (c) Calculate short- and long-term deflections and check the requirements of IS 456 regarding the deflection.	2,3	10

			
Q5	Illustrate the steps of designing transverse reinforcement in beams subjected to bending moment, shear and torsional moment.	5	4
Q6	State specific guidelines to select the initial dimensions/amount/grade of the following parameters before designing the reinforced concrete beams: (i) b, (ii) d, (iii) D, (iv) A_{st}, (v) diameter of reinforcing bars, (vi) grade of concrete and grade of steel.	1	3