

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

B.Tech-V Semester (CSE/IT/BT/ECE/CE)

COURSE CODE (CREDITS): 25B11CE513 (4)

MAX. MARKS: 15

COURSE NAME: DESIGN OF CONCRETE STRUCTURE

COURSE INSTRUCTOR: Dr. KAUSHAL KUMAR

MAX. TIME: 1 Hour

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of calculator is allowed, IS456:2000 is allowed, sharing of code isn't permitted.

Q.No	Question	CO	Marks
Q1	Explain the Limit State Method of Design. Define characteristic load, characteristic strength and partial safety factor. Why is this method preferred over the Working Stress Method?	1	3
Q2	State the assumptions used in the Limit State of Collapse in Flexure. Differentiate between under-reinforced, balanced and over-reinforced sections with a neat strain diagram.	1	2
Q3	What is development length? Write its expression for a bar in tension and explain the role of bond stress in providing adequate anchorage.	2	1.5
Q4	A singly reinforced RCC beam is 250 mm wide and has an effective depth of 400 mm. It is reinforced with 4 bars of 16 mm diameter. Using M20 concrete and Fe415 steel, determine: (i) Depth of neutral axis (ii) Limiting depth of neutral axis (iii) Nature of the section (iv) Ultimate moment of resistance.	1	2.5
Q5	A rectangular RCC beam of width 300 mm and effective depth 500 mm is subjected to a factored bending moment of 180 kN·m. Design the tension reinforcement using M20 concrete and Fe415 steel. Provide the required area of steel and suggest suitable reinforcement bars.	1	3
Q6	An RCC beam of width 250 mm and effective depth 500 mm carries a factored shear force of 180 kN. The beam contains 4 bars of 20 mm diameter as tension reinforcement. Using M20 concrete and Fe415 steel, calculate the nominal shear stress and comment whether shear reinforcement is required.	2	3