JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Make-up Examination-Nov-2025

COURSE CODE (CREDITS): 25M11CE111(3) MAX. MARKS: 25

COURSE NAME: DESIGN OF REINFORCED CONCRETE STRUCTURES

COURSE INSTRUCTORS: Dr. KAUSHAL KUMAR MAX. TIME: 1 Hour 30 Minutes

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

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

(C) IS 456:2000 AND Scientific Calculators are allowed.

Q.No	Question	CO	Marks
Q1	Determine Ast,lim and Mu,lim of the flanged beam. b_f = 1000 mm, D_f = 100 mm, b_w = 300 mm, cover = 50 mm and d = 450 mm. Use M 20 and Fe 415	2	6
Q2	A beam with b = 350 mm and d = 550 mm is subjected to a factored shear force of 400 kN. The beam is reinforced with 4-#32 as tension steel. Two bars are symmetrically bent at ends at 45 deg. Concrete Grade M25 and steel Grade = Fe415. Design the shear reinforcement.	3	7
Q3	Describe the importance of compatibility between steel and concrete in RCC. How do their similar thermal expansion properties and the bond between them contribute to the durability and strength of RCC structures?	1	4
Q4	Explain the stages of hydration, the chemical reactions involved, and the formation of hydration products such as C-S-H, calcium hydroxide, and ettringite. Discuss the impact of these products on the mechanical properties of concrete, including strength and durability.	1	4
Q5	Provide a detailed overview of different chemical and mineral admixtures used to modify concrete properties, such as superplasticizers, air-entraining agents, and fly ash. Discuss how these admixtures improve workability, strength, durability, and resistance to environmental conditions.	1	4

(100)