

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2025

B.Tech-4th Semester (CE)

COURSE CODE (CREDITS): 23B11CE411(3)

MAX. MARKS: 25

COURSE NAME: Concrete Technology

COURSE INSTRUCTORS: Prof. Ashok Kumar Gupta

MAX. TIME: 1.5 Hour

Note: (a) All questions are compulsory.

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

Q.No	Question	CO	Marks
Q1	<p>Calculate the quantities of ingredients required to produce one cubic meter of structural concrete. The mix is to be used in proportions of one part of cement to 1.37 parts of sand to 2.77 parts of 20 mm nominal size crushed coarse aggregate by dry-volumes with a water-cement ratio of 0.49 (by mass). Assume the bulk densities of cement, sand and coarse aggregate to be 1500, 1700 and 1600 kg/m³, respectively. The percentage of entrained air is 2.</p> <p style="text-align: center;">OR</p> <p>If a trailer mounted pump kept 40 m away from the building and if it is required to pump concrete 100 m vertically, calculate pressure in the pipeline.</p>	CO-4	5
Q2	Which are the different stages of manufacturing of concrete? Describe in detail the compaction of concrete.	CO-2	5
Q3	Define workability of concrete; enlist the different methods for measuring it in the laboratory? Explain any one of them.	CO-2	5
Q4	<p>What does strength in concrete mean?</p> <p>List the different types of concrete strengths. How are the compressive and flexural strengths determined? What is the relationship between compressive and flexural strength?</p>	CO-4	5
Q5	Determine the mix proportions for pumpable concrete with a slump of 75 to 100 mm, i.e., slump class S2 for application in structures for 50 year service life under exposure classes XC1, XC2, XC3 and XC4 using CEM-I class normal Portland cement with a specific gravity of 3.1. The materials available are crushed fine and coarse aggregates of specific gravity of 2.65 and 2.55, respectively.	CO-4	5

The sieve analysis results for the coarse and fine aggregates are given in Table . The standard deviation as obtained from past records is 5.0 MPa and the probability factor is 1.65.

Free water contents (l/m ³)	Fines content (kg/m ³)	
	Minimum	Maximum
150	260	365
160	280	390
170	295	415
180	315	440
190	330	465
200	350	490
210	365	515
220	385	540
230	400	565
240	420	590