

Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2021

Course: Concrete Technology	Semester: III
Programme: B Tech (Civil + ID)	Time: 03 hrs.
Max. Marks: 100	Course Code: CIVL 2011

Instructions: Write your assumptions carefully and attempt all the questions

SECTION A

S. No.		Marks	CO
Q1.	Define (i) slump and segregation for fresh concrete; (ii) carbonation and spalling in hardened concrete and outline how slump is associated with strength and durability of concrete.	4	CO1
Q2.	Describe the process of chloride ingress in concrete, and how it impacts the durability of a reinforced concrete structure.	4	CO2
Q3.	Differentiate between quality testing of fresh concrete and non-destructive testing of concrete.	4	CO2
Q4.	Explain each of the parameters for the equation; $F_t = F_c + k * s$ which is used to compute the target mean strength of concrete.	4	CO3
Q5.	Define Concrete Mix Design and also explain the three types of concrete mix design.	4	CO3

SECTION B

Q6.	Discuss how Heat of Hydration impacts the strength and durability of a structure (eg. Dam) which requires mass concreting. Also provide possible solutions adopted at site to tackle the issue.	10	CO2
Q7.	Differentiate between (i) initial setting time and final setting time for concrete; (ii) False setting and Flash Setting. Discuss how these impact workability and transportation of concrete at site.	10	CO1
Q8.	Elaborate on using admixtures to create self-compacting concrete and state if you believe the durability of concrete is compromised or not. Justify your perspective with technical facts and details.	10	CO2

OR

Q8.	How do water aggregate ratio, water content and water cement ratio relate to durability of a reinforced concrete structure? Use codal provisions to corroborate your statements from IS 456-2000 and justify your answer.	10	CO2
Q9.	How does concrete mix design ensure standardization and durability of a reinforced concrete structure?	10	CO3

SECTION C

Q10.	Explain the procedure for Rebound Hammer Test and describe the concept of the test and the test results and how to interpret the results to ascertain the compressive test of	20	CO2
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	the structure. Enumerate other NDT tests that are required in conjunction to validate and substantiate the results of the rebound hammer test.		
	OR		
Q10.	Discuss the various methods of transportation of concrete at site and how each method impacts the compressive strength of concrete.	20	CO2
Q11.	What is the significance of concrete mix design and what data is required to proceed with the IS 10262-2009 method?	20	CO3