Total number of printed pages: 2 **UG/4th Semester/UCE404**

2024

Concrete Technology

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	Define flakiness index.	3
	b)	What is reduction ratio of aggregates?	3
	c)	Give any two points on the basis of which it can be said that angular aggregates are superior to rounded aggregates.	4
	d)	What are the conditions under which the use of maximum size of aggregates are limited?	5
	e)	For heavily reinforced concrete, what are the conditions under which the nominal maximum size of aggregates are restricted?	5
2.	a)	Define chemical durability and physical durability with examples.	4
	b)	What is alkali silica reaction and what happens when this reaction occurs?	4
	c)	Enlist the various factors which contribute to volume change of concrete.	4
	d)	How chloride attack is different from sulphate attack in concrete.	4
	e)	How compaction and curing affects durability of concrete.	4
3.	a)	Discuss the types of concrete testing, give examples.	5
	b)	Define shrinkage and creep of concrete. How creep and shrinkage effects dimensional stability of concrete.	5
	c)	What is plastic shrinkage? How it occurs? What preventive measures can be adopted to minimize plastic shrinkage?	2+2+1
	d)	What do you understand by hardened concrete and enlist the properties which determine the quality of hardened concrete. Also define bond strength.	2+2+1
4.	a)	What is M25 concrete?	3
	b)	Give any three benefits to the concrete due to proper curing.	3

	c)	What will be the target strength of M25 concrete if standard deviation is 4.0	4
	d)	Write the curing method for the following, i. For laboratory test specimen ii. When small rectangular or square artificial ponds are built iii. When jute bags, plastic sheets are used as coverings iv. For prestressed concrete members	4
	e)	Calculate volume of cement, volume of water for 4 nos of cube assuming 25% wastage. If volume of concrete=1m^3 Mass of cement=383.2 kg/m^3 Mass of water=191.6 kg/m^3	6
5		Write the full form of OPC and PPC.	2
		Write some conditions where the risk of segregation is found to be greater.	6
		What do you understand by rheology of fresh concrete also describe how cohesive, viscous and frictional forces plays their role in mobility parameter.	6
		Draw the flow chart of manufacturing of Portland cement.	6
6	a)	What is heat of hydration?	2
	b)	What is the use of low heat Portland cement? To obtain this cement which compound is increased, which is reduced and which one is restricted.	2+3
	c)	define hydration of cement also discuss the basic mechanism occurring during strength acceleration phase.	2+5
	d)	Write the chemical composition of Portland cement. Also write the functions of every composition.	6
7.	a)	What is slump loss?	2
	b)	Why plasticizers are added to the concrete? Also discuss the mechanism of plasticizers.	6
	c)	How grading of concrete and use of admixture affect workability?	6
	d)	How design mix is different from nominal mix. Give some examples with their respective ratios.	6

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