

Reg.No. _____



Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : 14CE3002
Sub. Name : ADVANCED CONCRETE TECHNOLOGY

Semester : 2016-17 ODD
Duration : 3hrs
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks																	
1.	a.	Cement after setting shall not undergo any appreciable change in volume. Explain how this property of cement is evaluated using Le .Chatelier apparatus with neat sketch	CO1	5																	
	b.	‘Manufacturing processes of Portland cement determines its quality’ – discuss the manufacturing processes with neat sketches.	CO1	10																	
	c.	Differentiate workability agent and retarders	CO1	5																	
(OR)																					
2.	a.	Heavy weight aggregates are used for shielding and to produce high density concrete List the names of any two heavy weight aggregates.	CO1	4																	
	b.	Explain the lab test and field test on cement with the aid of diagrams wherever applicable	CO1	12																	
	c.	Nowadays PPC is widely used for construction. Briefly explain PPC and its advantages over OPC.	CO1	4																	
3.	a.	Discuss the factors helping concrete to have more lubricating effect to reduce internal friction for helping easy compaction in detail	CO1	7																	
	b.	Apart from the report of ACI committee 212, M.R.Rixom also classified the admixture. Explain them in detail with respect to their application.	CO1	7																	
	c.	How does the shape and size of aggregates help in modifying the property of concrete	CO1	6																	
(OR)																					
4.	a.	As a quality engineer in Park construction,, you are assigned to check the quality in the concrete manufactured in site. Elaborate on the step by step process of manufacturing with its significance.	CO1	10																	
	b.	State the precise and sensitive workability test done by measuring density ratio. Define the same. Explain the method with the aid of sketches,	CO1	10																	
5.	a.	Explain the term modulus of elasticity of concrete. Mention how it is experimentally determined as per IS code?.	CO1	10																	
	b.	The strength of a fully matured concrete is found to be 30 MPa. Find the strength of an identical concrete at the age of 14 days when cured at an average temperature during day time at 22 ° C and night time at 8 ° C	CO1	4																	
Plowman's Coefficients																					
<table><tr><td rowspan="2">Strength after 28 days at 18°C (Maturity of 19,800°C.h): MPa</td><td colspan="2">Coefficient</td></tr><tr><td>A</td><td>B</td></tr><tr><td>Less than 17.5</td><td>10</td><td>68</td></tr><tr><td>17.5 – 35.0</td><td>21</td><td>61</td></tr><tr><td>35.0 – 52.5</td><td>32</td><td>54</td></tr><tr><td>52.5 – 70.0</td><td>42</td><td>46.5</td></tr></table>					Strength after 28 days at 18°C (Maturity of 19,800°C.h): MPa	Coefficient		A	B	Less than 17.5	10	68	17.5 – 35.0	21	61	35.0 – 52.5	32	54	52.5 – 70.0	42	46.5
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	c.	Explain the methods of curing of concrete	CO1	6
(OR)				
6.	a.	Design a concrete mix as per IS with the following data: Characteristic compressive strength..... 30 N/mm ² Maximum size of coarse aggregate..... 20mm Degree of workability.....100 mm(slump value) Degree of control..... Good Type of exposure..... Severe Specific gravity of cement..... 3.15 Specific gravity of coarse aggregate..... 2.60 Specific gravity of fine aggregate..... 2.60 Water absorption – Coarse aggregate..... 0.5% Water absorption – Fine aggregate..... 1.0% Free surface moisture – fine aggregate..... 0% Entrapped air..... 0% Fine aggregate grading..... Zone III Assuming suitable datas wherever necessary calculate the quantity of materials required to cast slab of area 10,000sft and 4 ½” thick	CO1	12
	b.	Explain the concept of mix design	CO2	2
	c.	What are the variables and various methods of proportioning	CO2	3
	d.	Give the relationship between average design strength and specified minimum strength	CO2	3
7.	a.	Formulate the relationship between compressive strength and tensile strength	CO1	4
	b.	Explain the rheological approach of creep	CO1	4
	c.	Discuss plastic shrinkage and drying shrinkage.	CO1	4
	d.	Define durability of concrete and its significance	CO1	4
	e.	Write a note on the impact of water cement ratio on durability of concrete	CO1	4
(OR)				
8.	a.	Write a note on i) shotcrete ii) vacuum concrete iii) ferrocement iv) No fines concrete	CO1	20
<u>Compulsory:</u>				
9.	a.	How to evaluate an old monument or structure for their durability without disturbing a part or whole. Give the experimental procedure for any five tests with relevant sketches.	CO1	20

Course Outcome:

CO1: Understand the behaviour of the concrete	CO2: Carry out the mix design by various methods and for special concrete
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ALL THE BEST