

B. E. CONSTRUCTION ENGINEERING 2ND YEAR 2ND SEMESTER - 2023**SUBJECT: CONCRETE TECHNOLOGY**

Time : Three Hours

(50 Marks for each Part)

Full Marks :100

Use separate answer script for each Part

	Question No.	PART I (50 Marks)	Marks																
CO1		Answer any two from question (1), question (2), question (3) and question (4) in this block																	
	Q1.	<p>Calculate the Fineness Modulus of a fine aggregate sample from the following data</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Sieve size (mm)</th> <th>Weight retained (gm)</th> </tr> </thead> <tbody> <tr> <td>4.75</td> <td>20.0</td> </tr> <tr> <td>2.36</td> <td>60.0</td> </tr> <tr> <td>1.18</td> <td>60.0</td> </tr> <tr> <td>0.600</td> <td>30.0</td> </tr> <tr> <td>0.300</td> <td>20.0</td> </tr> <tr> <td>0.150</td> <td>10.0</td> </tr> <tr> <td>>0.150</td> <td>Nil</td> </tr> </tbody> </table> <p>Total weight of sample taken for sieve analysis = 200gms. Briefly mention the information obtained from the value of Fineness Modulus</p>	Sieve size (mm)	Weight retained (gm)	4.75	20.0	2.36	60.0	1.18	60.0	0.600	30.0	0.300	20.0	0.150	10.0	>0.150	Nil	10
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	Q2.	Write a short note on porosity and water absorption of aggregates.	10																
	Q3.	<p>i) Write a short note on bulking of sand.</p> <p>ii) Whether it is to be considered in volume batching or weigh batching of concrete?</p> <p>iii) How bulking is taken care of in mix proportioning of concrete?</p>	10																
	Q4.	Write a short note on water reducing and high range water reducing admixtures.	10																
CO3		Answer any two from question (5), question (6) and question (7) in this block																	
	Q5.	<p>i) What do you understand by batching of materials during concreting?</p> <p>ii) What are the different methods of batching?</p> <p>iii) What are the different types of mixers used in mixing of concrete?</p> <p>iv) Briefly mention the different modes of transportation and placing of concrete?</p>	01 01 01 02																

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	Question No.		Marks
	Q6.	Write a short note on the use of curing compound.	05
	Q7.	Prepare a check list for the supervisors for transportation and placement of concrete.	05
CO4 [08]		Answer any one from question (8a) and question (8b) in this block	
	Q8a.	<p>The following data are related to mix design of M 30 grade concrete.</p> <p>Specific Gravity of Coarse Aggregate, Fine Aggregate, Cement and Chemical Admixture are 2.88, 2.66, 2.93 & 1.18 respectively.</p> <p>Water absorption of Coarse and Fine Aggregates are 0.90% and 1.1% respectively. Moisture content of Coarse and Fine Aggregates are 0.5% and 2.6% respectively.</p> <p>Entrapped air as percentage of volume of concrete is 1%.</p> <p>From mix design, the following data are obtained.</p> <p>Cement = 400 kg/m³</p> <p>Water cement ratio = 0.40</p> <p>Coarse Aggregate = 1274 kg/m³</p> <p>Chemical Admixture = 2.40kg/m³</p> <p>i) Find out the quantity of Fine Aggregate in saturated and surface dry condition</p> <p>ii) Find out the quantity of Coarse Aggregate, Fine Aggregate and Water per m³ after adjustment due to Moisture Absorption and Moisture Content</p>	08
	Q8b.	<p>Write short notes on</p> <p>i) Target Mean strength</p> <p>ii) Standard deviation</p> <p>in case of concrete mix design.</p>	08
CO5 [12]	Q9a.	Briefly discuss the different factors that affect durability of concrete.	07

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Question No.		Marks
Q9b.	<p>State whether the following statements are TRUE or FALSE</p> <p>i) Minimum period before striking of formwork for columns is 7 days.</p> <p>ii) For tremie concrete, the minimum slump is 150mm</p> <p>Select the correct answer</p> <p>iii) Dimension of concrete cube moulds normally used in India a) 50mm x 50mm x 50mm b) 70.6mm x 70.6mm x 70.6mm c) 150mm x 150mm x 150mm d) 100mm x 100mm x 100mm</p> <p>iv) Minimum grade of concrete for reinforced concrete work a) M-15 b) M-20 c) M-25 d) M-30</p> <p>v) The pH value of construction water should be a) < 3 b) < 5 c) < 6 d) > 6</p>	05

Total Time : Three hours

Full Marks: 100

PART II (50 marks)

Use separate Answer Sheet for Each Part

Answer any ten questions [10x5=50]

[1]) Explain briefly the formation of Portland cement?

[2] Name the oxide composition of Portland cement?

[3] What are the different products of hydration of various components of cement?

[4] Write a short note on initial and final setting time of cement? Why Gypsum is added to cement clinker.?

[5] What is heat of hydration? How can heat of hydration be reduced?

[6] What do you mean by soundness of cement and how can it be measured?

[7] Discuss the different types of cement to be used in different conditions?

[8] Write down the functions of different concrete making materials?

[9] Define the water cement ratio and binder ratio. why and how does water cement ratio affect compressive strength of concrete?

[10] what do you mean by transition zone? write about the strength of transition zone.

[11] discuss the factors affecting the compressive strength of concrete.

[12] What do you mean by curing of concrete? How does curing affect strength of concrete?

[13] write a short note on creep and shrinkage of concrete.

[14] what do you mean by workability of concrete? what are the factors which influencing the concrete.

[15] write a short note on blended cement.