

B. E. CONSTRUCTION ENGINEERING 4TH YEAR 1ST SEMESTER - 2024**SUBJECT: ADVANCED CONCRETE TECHNOLOGY**

Time : Three Hours

Full Marks : 100

Part I

	Question No.		Marks
CO2 [15]		Answer any one question from question (Q1) and question (Q2) in this block.	
	Q1a.	Describe the different types of shrinkage that may occur in concrete	09
	Q1b.	Briefly explain the following <ul style="list-style-type: none"> • Transition zone in concrete microstructure • Pozzolan and pozzolanic reaction • Pore refinement • Grain refinement 	06
	Q2.	Write a short note on Fly-ash based concrete.	15
CO3 [10]		Answer any one from question (Q3) and question (Q4) in this block.	
	Q3.	Discuss the improvement in properties when fibres are introduced to concrete	10
	Q4.	a) Write short note on "Passing Ability" of concrete	05
		b) What are the advantage of self compacting concrete over conventional concrete?	05
CO4 [15]		Answer any one from question (Q5) and (Q6) in this block.	
	Q5a.	What are the different factors on which strength test results on concrete depends ?	03
	Q5b.	Describe the procedure of preparation of concrete cylinder test specimens for compression test.	06
	Q5c.	Discuss the different modes of transport of harmful ingredients into concrete.	06
	Q6a.	What do you understand by Durability of concrete ?	02

[Turn over

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	Question No.		Marks
	Q6b.	What are the different factors that affect durability of concrete ?	08
	Q6c.	What are the measures that can be taken to improve the durability performance of concrete ?	05
CO5 [10]	Q7.	<p>The mix design of a M40 grade concrete resulted in the following quantities of ingredients per m³.</p> <p>Cement : 420 kg/m³ Water : 168 kg/m³ Fine aggregate : 773 kg/m³ Coarse aggregate : 1137 kg/m³</p> <p>The weight of coarse and fine aggregate are in saturated and surface dry condition.</p> <p>Chemical admixture : 3.50 liter Specific gravity of chemical admixture : 1.19 Solid content of admixture : 25% Moisture absorption of coarse and fine aggregate are 0.75% and 1.25% respectively. Moisture content of coarse and fine aggregate are 0.50% and 2% respectively.</p> <p>Calculate the quantities of water, coarse and fine aggregate per m³ after necessary moisture correction.</p>	10

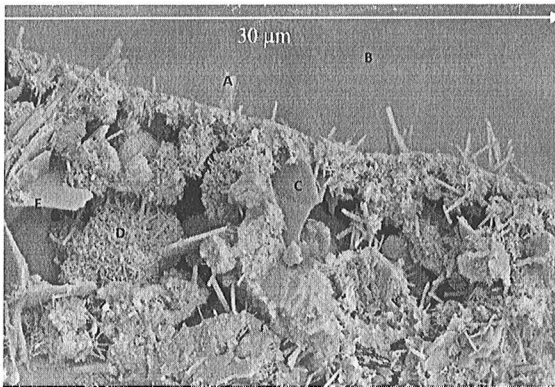
B. Construction Engineering 4th year 1st semester Examination – 2024
 Subject: Advance Concrete Technology

Time : Three hours
Full Marks: 100

Part-II(Full Marks-50)
Use separate Answer Sheet for Each Part

1. Answer any two of the following questions- [15×2=30 Marks]

(a) Identify the different products A,B,C,D & E resulting from the hydration of cement from the following photograph? Describe microstructural features of the various hydration products? [5+10=15]



(b) Write a short note on creep and shrinkage of concrete [15]

(c) Describe the significance of the Interfacial Transition Zone? Describe the relationship between gel/space ratio and strength of concrete? [7+3+5]

2. Write the effect of addition of the following materials on Concrete mix with respect to workability, strength, porosity and shrinkage (Any two)[5×2=10 Marks]

- a. Fly Ash
- b. Slag
- c. Silica Fume

3. Write Short Notes on any two of the following [2 ×5=10 Marks]

- a. Lime Saturation Factor
- b. Sulphuric Anhydride
- c. Heat of Hydration