Course Code: 18CE0136 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583
QUESTION BANK (DESCRIPTIVE)

Subject with Code: **Concrete Technology** (18CE0136) **Course & Branch**: B.Tech - CE

Regulation: R18 **Year & Sem:** IV-B.Tech & I-Sem

UNIT –I
CEMENTS & ADMIXTURES, AGGREGATES

1	a	What is the function of gypsum in the cement?	[L1][CO1]	**[2M]**
	b	What do you mean by hydration?	[L1][CO1]	**[2M]**
	c	List the advantages of using plasticizers?	[L1][CO1]	**[2M]**
	d	What is known as admixtures?	[L1][CO1]	**[2M]**
	e	Difference between basic ingredients of concrete and admixtures.	[L1][CO2]	**[2M]**
2		What are Bouge's compounds? Explain in detail how each one of these compounds influences the strength and setting properties of cement.	[L1][CO1]	**[10M]**
3	a	Explain heat of hydration and hydration process of cement in detail.	[L2][CO1]	**[5M]**
	b	Explain setting time of cement and factors effecting setting time of cement.	[L2][CO1]	**[5M]**
4	a	Discuss about the chemical composition of Ordinary Portland cement.	[L2][CO1]	**[5M]**
	b	What are the different grades of cement and explain each.	[L1][CO1]	**[5M]**
5	a	Explain the term super plasticizers. How are they useful in concrete production?	[L2][CO1]	**[5M]**
	b	Explain the advantages of using plasticizers and super plasticizers in concrete making.	[L1][CO1]	**[5M]**
6	a	Briefly write the significance of following properties: i) Specific gravity ii) Bulk Density iii) Porosity iv) Absorption	[L2][CO1]	**[10M]**
7		Define the term "Bulking of aggregates". Explain its significance with reference to concrete making. Explain the simple field test to determine the bulking of aggregates.	[L1][CO2]	**[10M]**
8	a	What do you mean by soundness of aggregate? Explain.	[L1][CO2]	**[5M]**
	b	What is alkali-aggregate reaction? And how will it affect the concrete properties.	[L1][CO2]	**[5M]**
9	a	How would you grade the aggregates by conducting sieve analysis on aggregates in laboratory? Explain the procedure with appropriate table.	[L1][CO2]	**[8M]**
	b	Write short notes on gap graded aggregates.	[L1][CO2]	**[2M]**
10	a	List the physical properties of aggregates. Explain any two properties.	[L2][CO1]	**[5M]**
	b	What are all the mechanical properties of aggregates? Explain any one with experimental procedure.	[L2][CO2]	**[5M]**

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UNIT –II
HARDENED CONCRETE

1	**a**	Define water cement ratio.	[L1][CO3]	**[2M]**
	b	Define Abram's law.	[L1][CO3]	**[2M]**
	c	Define curing.	[L1][CO3]	**[2M]**
	d	List the different factors affecting workability.	[L1][CO3]	**[2M]**
	e	Write different mechanical properties of concrete.	[L1][CO3]	**[2M]**
2		Briefly explain about manufacturing of concrete.	[L2][CO3]	**[10M]**
3		With neat diagram, write the procedure involved in determining the split tensile strength of concrete.	[L2][CO3]	**[10M]**
4		Explain the various factors affecting strength of hardened concrete.	[L2][CO3]	**[10M]**
5	**a**	Explain the Maturity concept for strength development of concrete.	[L2][CO3]	**[5M]**
	b	Explain the relation between compression strength and tensile strength of concrete.	[L2][CO3]	**[5M]**
6	**a**	Shortly explain about Gel space ratio	[L2][CO3]	**[5M]**
	b	Explain different methods of curing procedure.	[L2][CO3]	**[5M]**
7		Explain the procedure for compression test of hardened concrete	[L2][CO3]	**[10M]**
8		Explain the procedure for determination of flexural strength of hardened concrete	[L2][CO3]	**[10M]**
9		Explain the phenomenon of gain of strength of concrete with age.	[L1][CO3]	**[10M]**
10		What is curing? What are the different methods of curing?	[L1][CO3]	**[10M]**

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UNIT –III
ELASTICITY, CREEP & SHRINKAGE, NON-DESTRUCTIVE TESTING METHODS

1	**a**	Differentiate destructive testing and Non destructive testing.	[L1][CO4]	**[2M]**
	b	Define Creep.	[L1][CO4]	**[2M]**
	c	Define Shrinkage.	[L1][CO4]	**[2M]**
	d	List out different tests in NDT.	[L1][CO1]	**[2M]**
	e	Define Dynamic modulus of Elasticity.	[L1][CO4]	**[2M]**
2	Explain Schmidt's Rebound Hammer test and the limitations and applications of the same.		[L2][CO4]	**[10M]**
3	Explain the various pulse velocity methods and the techniques measuring the pulse velocity through concrete.		[L2][CO4]	**[10M]**
4	**a**	What are the various factors affecting the compressive strength of concrete?	[L1][CO4]	**[5M]**
	b	Explain in detail about the rebound hammer test (NDT) that is conducted on existing structure to assess its strength with a neat diagram.	[L2][CO4]	**[5M]**
5	Explain Creep of concrete and relation between creep and time.		[L2][CO4]	**[10M]**
6	**a**	How the shrinkage of concrete is classified? And explain each one of them briefly.	[L1][CO4]	**[5M]**
	b	Explain the procedure to conduct Modulus of elasticity test in the laboratory and explain the various factors affecting the modulus of elasticity.	[L2][CO4]	**[5M]**
7	Write the procedure involved in conducting pullout test. Write its significance.		[L1][CO4]	**[10M]**
8	**a**	What is shrinkage of concrete?	[L1][CO4]	**[5M]**
	b	Explain the various factors affecting shrinkage of concrete.	[L2][CO4]	**[5M]**
9	**a**	What are the factors that affect the creep and shrinkage of concrete?	[L1][CO4]	**[5M]**
	b	How will you find the reinforcement's location and dimension using profometer. Explain briefly.	[L1][CO4]	**[5M]**
10	Explain the procedure for UPV and Rebound hammer test.		[L2][CO4]	**[10M]**

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UNIT –IV
PERMEABILITY AND DURABILITY

1	**a**	Define permeability of concrete.	[L1][CO5]	**[2M]**
	b	How the permeability of concrete affects the strength?	[L1][CO5]	**[2M]**
	c	What are the factors affecting durability of concrete?	[L1][CO5]	**[2M]**
	d	What do you mean by hardened concrete?	[L1][CO5]	**[2M]**
	e	List the factors affecting strength of hardened concrete?	[L1][CO5]	**[2M]**
2		Explain about factors affecting permeability of concrete.	[L2][CO5]	**[10M]**
3		How the performance of concrete is affected by acid attack. Write briefly.	[L2][CO5]	**[10M]**
4		Which are all the effects of Sulphate attack on concrete? Explain briefly.	[L2][CO5]	**[10M]**
5		Do you think the sea water affect the strength of concrete? If yes, explain how?	[L2][CO5]	**[10M]**
6		Explain briefly about chloride attack on concrete	[L2][CO5]	**[10M]**
7		Explain the phenomenon of corrosion in steel. Suggest the methods for corrosion control.	[L1][CO5]	**[10M]**
8		How would you improve the quality of concrete by doing surface treatment. Explain with appropriate examples.	[L1][CO5]	**[10M]**
9		Write briefly about deterioration of concrete by Abrasion, Erosion and Cavitation.	[L1][CO5]	**[10M]**
10		Write and explain the effects of materials on durability.	[L1][CO5]	**[10M]**

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UNIT –V
MIX DESIGN

1	**a**	What are the data used for ACI	[L1][CO6]	**[2M]**
	b	What is the strength of concrete after 7 days?	[L1][CO6]	**[2M]**
	c	How mixing operation is done in concrete.	[L1][CO6]	**[2M]**
	d	What is nominal mix and design mix?	[L1][CO6]	**[2M]**
	e	List out the usage of slump values	[L1][CO6]	**[2M]**
2		Design a concrete mix of M20 grade for a roof slab. Take a standard deviation of 4MPa. The specificgravities of Coarse Aggregate and Fine Aggregate are 2.67 and 2.73 respectively. The bulk density of coarse aggregate is 16020 Kg/m^3 and Fineness Modulus of Fine Aggregate is 2.76. A slump of 50mm is necessary. The water absorption of coarse aggregate is 1% and free moisture in fine aggregate is 3%. Design the concrete mix using ACI method. Assume any missing data suitably.	[L3][CO6]	**[10M]**
3		Explain the mix design procedure of concrete as per ACI code Method.	[L2][CO6]	**[10M]**
4		Design a M35 concrete mix using IS method of Mix Design for the following data: 1) Maximum size of aggregate - 20mm (Angular) 2) Degree of workability - 0.90 compaction factor. 3) Quality control - good 4) Type of exposure - mild 5) Specific Gravity A. Cement - 3.12 (B. Sand - 2.63 (C. Coarse aggregate - 2.666) Water absorption: A. Coarse aggregate - 0.5% (B. Fine aggregate - 1.0% 7) Free surface moisture: (A. Coarse aggregate - Nil (B. Fine aggregate - 2.2%8) Sand confirms to Zone I grading. Assume any other data required suitably.	[L3][CO6]	**[10M]**
5		Design a M30 concrete mix using IS method of Mix Design for the following data: 1) Maximum size of aggregate - 20mm (Angular). 2) Degree of workability - 0.90 compaction factor. 3) Quality control - good 4) Type of exposure - severe 5) Specific Gravity: A. Cement - 3.10 B. Sand - 2.68 C. Coarse aggregate - 2.69 6) Water absorption: A. Coarse aggregate -1.0% B. Fine aggregate - 2.0% 7) Free surface moisture: A. Coarse aggregate- Nil B. Fine aggregate- 2.0% 8) Sand confirms to zone III grading. Assume any other data required suitably	[L3][CO6]	**[10M]**

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6	**a**	Define the term "Mix Design of Concrete" and explain its significance.	[L1][CO6]	**[5M]**
	b	Briefly discuss various methods of the mix design available in literature.	[L2][CO6]	**[5M]**
7		Brief explain about factors affecting choice of mix design.	[L2][CO6]	**[10M]**
8		Explain quality control of concrete and durability of concrete.	[L2][CO6]	**[10M]**
9		Explain the mix design procedure of concrete as per IS code Method.	[L2][CO6]	**[10M]**
10		What are the factors considered in Mix Proportions? Explain Briefly.	[L1][CO6]	**[10M]**

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