



**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: : PUTTUR
(AUTONOMOUS)**

Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code: CONCRETE TECHNOLOGY (20CE0139)

Course & Branch: B.Tech - CE

Year & Sem: III-B.Tech & II-Sem

Regulation: R20

UNIT-I

CEMENTS & ADMIXTURES, AGGREGATES

1	What are Bogue's compounds? Explain in detail how each one of these compounds influences the strength and setting properties of cement.	[L1][CO1]	[12M]
2	a Explain heat of hydration and hydration process of cement in detail.	[L2][CO1]	[6M]
	b Explain setting time of cement and factors effecting setting time of cement.	[L2][CO1]	[6M]
3	a Discuss about the chemical composition of Ordinary Portland cement.	[L2][CO1]	[6M]
	b What are the different grades of cement and explain each.	[L1][CO1]	[6M]
4	a Explain the term super plasticizers. How are they useful in concrete production?	[L2][CO1]	[6M]
	b Explain the advantages of using plasticizers and super plasticizers in concrete making.	[L1][CO1]	[6M]
5	Briefly write the significance of following properties: Specific gravity, Bulk Density, Porosity and Absorption & Moisture Content of Aggregate	[L2][CO1]	[12M]
6	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][CO1]	[12M]
7	a What do you mean by soundness of aggregate? Explain.	[L1][CO1]	[6M]
	b What is alkali-aggregate reaction? And how will it affect the concrete properties.	[L1][CO1]	[6M]
8	a How would you grade the aggregates by conducting sieve analysis on aggregates in Laboratory? Explain the procedure with appropriate table.	[L1][CO1]	[8M]
	b Write short notes on gap graded aggregates.	[L1][CO1]	[4M]
9	List the physical properties of aggregates. Explain any two properties.	[L2][CO1]	[12M]
10	What are all the mechanical properties of aggregates? Explain any one with experimental procedure.	[L2][CO1]	[12M]

UNIT-II
HARDENED CONCRETE

1	What are the various factors affecting the compressive strength of concrete?	[L2][CO2]	[12M]
2	With neat diagram, write the procedure involved in determining the split tensile strength of concrete.	[L2][CO2]	[12M]
3	Explain the various factors affecting strength of hardened concrete.	[L2][CO2]	[12M]
4	a Explain the Maturity concept for strength development of concrete.	[L2][CO2]	[6M]
	b The strength of a sample of fully matured concrete is found to be 40 MPa. Find the strength of identical concrete at the age of 7 days when cured at an average temperature during day time at 20°C and night time at 10°C.	[L3][CO2]	[6M]
5	a Shortly explain about Gel space ratio	[L2][CO2]	[6M]
	b Calculate the gel /space ratio and the theoretical strength of a sample of concrete made with 500 gm. of cement with 0.5 water/cement ratio, on full hydration and 60 percent hydration.	[L2][CO2]	[6M]
6	Explain the procedure for compression test of hardened concrete	[L2][CO2]	[12M]
7	Explain the procedure for determination of flexural strength of hardened concrete	[L2][CO2]	[12M]
8	Explain the phenomenon of gain of strength of concrete with age.	[L1][CO2]	[12M]
9	What is curing? What are the different methods of curing?	[L1][CO2]	[12M]
10	Explain the relation between compression strength and tensile strength of concrete.	[L2][CO2]	[12M]

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

1	a	What is shrinkage of concrete?	[L1][CO3]	[6M]
	b	Explain the various factors affecting shrinkage of concrete.	[L2][CO3]	[6M]
2	a	What are the factors that affect the creep and shrinkage of concrete?	[L1][CO3]	[6M]
	b	How will you find the reinforcement's location and dimension using profometer. Explain briefly.	[L1][CO3]	[6M]
3		Explain the procedure to conduct Modulus of elasticity test in the laboratory and explain the various factors affecting the modulus of elasticity.	[L2][CO3]	[12M]
4		How the shrinkage of concrete is classified? And explain each one of them briefly.	[L1][CO3]	[12M]
5		Explain Creep of concrete and relation between creep and time.	[L2][CO3]	[12M]
6		Explain Schmidt's Rebound Hammer test and the limitations and applications of the same.	[L2][CO4]	[12M]
7		Explain the various pulse velocity methods and the techniques measuring the pulse velocity through concrete.	[L2][CO4]	[12M]
8		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]	[12M]
9		Write the procedure involved in conducting pullout test. Write its significance.	[L1][CO4]	[12M]
10		Explain the procedure for UPV and Rebound hammer test.	[L2][CO4]	[12M]

UNIT-IV
PERMEABILITY AND DURABILITY

1	Explain about factors affecting permeability of concrete.	[L2][CO5]	[12M]
2	How the performance of concrete is affected by acid attack. Write briefly.	[L2][CO5]	[12M]
3	Which are all the effects of Sulphate attack on concrete? Explain briefly.	[L2][CO5]	[12M]
4	What are the methods of controlling sulphate attack, Explain Briefly?	[L2][CO5]	[12M]
5	Do you think the sea water affect the strength of concrete? If yes, explain how?	[L2][CO5]	[12M]
6	Explain briefly about chloride attack on concrete	[L2][CO5]	[12M]
7	Explain the phenomenon of corrosion in steel. Suggest the methods for corrosion control.	[L2][CO5]	[12M]
8	How would you improve the quality of concrete by doing surface treatment? Explain with appropriate examples.	[L2][CO5]	[12M]
9	Write briefly about deterioration of concrete by Abrasion, Erosion and Cavitation.	[L1][CO5]	[12M]
10	Write and explain the effects of materials on durability.	[L2][CO5]	[12M]

UNIT-V
MIX DESIGN

1	Design a concrete mix of M20 grade for a roof slab. Take a standard deviation of 4MPa. The specific gravities 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]	[12M]
2	Explain the mix design procedure of concrete as per ACI code Method.	[L2][CO6]	[12M]
3	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 6) 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]	[12M]
4	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]	[12M]

5	a	Define the term “Mix Design of Concrete” and explain its significance.	[L1][CO6]	[6M]
	b	Briefly discuss various methods of the mix design available in literature.	[L2][CO6]	[6M]
6		Brief explain about factors affecting choice of mix design.	[L2][CO6]	[12M]
7		Explain quality control of concrete and durability of concrete.	[L2][CO6]	[12M]
8		Explain the mix design procedure of concrete as per IS code Method.	[L2][CO6]	[12M]
9		What are the factors considered in Mix Proportions? Explain Briefly.	[L1][CO6]	[12M]
10	a	Discuss briefly about durability best practices for concrete mix designs.	[L1][CO6]	[6M]
	b	What are the factors affecting durability of concrete?	[L2][CO6]	[6M]

**PREPARED BY: A.BRAHMINI,
Asst. Professor, CE**