



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

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QUESTION BANK (DESCRIPTIVE)

Subject with Code: CONCRETE TECHNOLOGY (23CE0112)

Course & Branch: B.Tech & CE

Year & Sem: II Year & II Sem

Regulation: R23

UNIT –I CEMENTS & AGGREGATES

1	a	List Bogue's compound?	[L1][CO1]	[2M]
	b	What are the advantages of Portland pozzolana cement over Portland cement?	[L1][CO1]	[2M]
	c	Mention any four chemical admixtures used in concrete?	[L1][CO1]	[2M]
	d	What are the different tests conducted on aggregates?	[L1][CO1]	[2M]
	e	Classify aggregates according to their shape.	[L2][CO1]	[2M]
2	a	Describe the process of manufacture of cement by wet process.	[L2][CO1]	[5M]
	b	List and explain different grades of cement.	[L1][CO1]	[5M]
3		Identify suitable admixtures for a concrete mix needed in hot weather conditions and explain your choice.	[L3][CO1]	[10M]
4	a	Discuss about the chemical composition of Ordinary Portland cement.	[L2][CO1]	[5M]
	b	Describe the process of hydration in Portland cement.	[L2][CO1]	[5M]
5	a	Explain setting time of cement and factors effecting setting time of cement.	[L2][CO1]	[5M]
	b	How would you determine the fineness of cement in a laboratory setting?	[L3][CO1]	[5M]
6		Analyze the role of Bogue's compounds in the hydration process of cement. How do variations in the proportions of these compounds influence the strength development and setting time of cement in different environmental conditions?	[L4][CO1]	[10M]
7	a	Explain what alkali-aggregate reaction is and how it affects the properties of concrete.	[L2][CO1]	[6M]
	b	How does the quality of mixing water affect the properties and durability of concrete?	[L2][CO1]	[4M]
8		Briefly write the significance of following properties: Specific gravity, Bulk Density, Porosity and Absorption & Moisture Content of Aggregate.	[L2][CO1]	[10M]
9	a	What are the different types of aggregates based on size, source, and quality?	[L1][CO1]	[6M]
	b	Explain what gap-graded aggregates. How do they affect the properties of concrete?	[L2][CO1]	[4M]
10		What are all the mechanical properties of aggregates? Explain Aggregate impact test with experimental procedure.	[L2][CO1]	[10M]
11		How would you interpret the particle size distribution? Provide the procedure for sieve analysis along with an appropriate table to illustrate your analysis.	[L4][CO1]	[10M]

UNIT –II
FRESH CONCRETE

1	a	What is meant by batching in concrete production?	[L1][CO2]	[2M]
	b	Describe how mixing time affects the consistency of concrete.	[L1][CO2]	[2M]
	c	Define workability of concrete.	[L1][CO2]	[2M]
	d	Write the advantages of using ready mix concrete.	[L1][CO2]	[2M]
	e	Discuss the shot crete and types of shotcreting.	[L1][CO2]	[2M]
2	a	Explain briefly the importance of the Proportion stage in concrete manufacturing.	[L2][CO2]	[5M]
	b	How do the setting times of concrete influence its properties?	[L1][CO2]	[5M]
3		Define the term workability. What are the various tests conducted to determine the Workability of concrete and explain them.	[L3][CO2]	[10M]
4		Discuss the significance of the mixing and placing stage in concrete manufacturing. How do these stages affect the workability and strength of concrete?	[L2][CO2]	[10M]
5	a	State and explain the five important factors which affect the workability of concrete mix.	[L2][CO2]	[5M]
	b	Explain how time and temperature affect the workability of fresh concrete.	[L2][CO2]	[5M]
6		Explain different types of compaction that can be used in Production of concrete.	[L2][CO2]	[10M]
7		What are the different types of curing methods used in concrete manufacturing? Explain how each method affects the concrete's strength and durability.	[L1][CO2]	[10M]
8		Make a comparative study on the slump test and the compacting factor test and explain briefly the procedure and their limitations.	[L3][CO2]	[10M]
9		Explain the properties of fresh concrete and factors affecting properties of fresh concrete.	[L2][CO2]	[10M]
10	a	Explain the phenomena of segregation and bleeding in concrete. How do they affect the quality and strength of the final structure?	[L2][CO2]	[6M]
	b	Explain what shot crete is and how it differs from conventional concrete placing.	[L2][CO2]	[4M]
11		Explain what ready-mix concrete is and how it differs from traditional concrete mixing methods. What are the benefits of using ready-mix concrete?	[L2][CO2]	[10M]

UNIT –III
HARDENED CONCRETE

1	a	Write different mechanical properties of concrete.	[L1][CO3]	[2M]
	b	List the different factors affecting workability.	[L1][CO3]	[2M]
	c	Define water –cement ratio	[L1][CO3]	[2M]
	d	Define Abram's Law.	[L1][CO4]	[2M]
	e	List out different tests in NDT.	[L1][CO4]	[2M]
2	a	Shortly explain about Gel Space Ratio.	[L2][CO3]	[4M]
	b	Calculate the gel /space ratio and the theoretical strength of a sample of concrete made with 450 gm. of cement with 0.45 water/cement ratio, on full hydration and 70 percent hydration	[L3][CO3]	[6M]
3		What are the various factors affecting the strength of concrete?	[L1][CO3]	[10M]
4	a	Explain the Maturity concept for strength development of concrete.	[L2][CO3]	[4M]
	b	The strength of a sample of fully matured concrete is found to be 55 MPa. Find the strength of identical concrete at the age of 7 days when cured at an average temperature during day time at 22° C and night time at 12° C	[L3][CO3]	[6M]
5		Explain how a compression test is conducted and discuss its importance in material testing.	[L2][CO3]	[10M]
6		Write the procedure involved in conducting pullout test. Write its significance.	[L2][CO3]	[10M]
7		With neat diagram, write the procedure involved in determining the split tensile strength of concrete.	[L2][CO4]	[10M]
8	a	Define flexural strength and explain its significance in the design of structural components.	[L1][CO4]	[3M]
	b	Explain the procedure for determination of flexural strength of hardened concrete	[L2][CO4]	[7M]
9		How does a profometer work and how will you find the reinforcement's location and dimension using profometer. Explain briefly.	[L2][CO4]	[10M]
10	a	Explain about Non-Destructive Testing (NDT).	[L2][CO4]	[3M]
	b	Explain Ultra Sonic Pulse velocity method and the techniques measuring the pulse velocity through concrete.	[L1][CO4]	[7M]
11		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]	[10M]

UNIT –IV

ELASTICITY, CREEP & SHRINKAGE

1	a	What is Modulus of Elasticity?	[L1][CO5]	[2M]
	b	Define Dynamic modulus of Elasticity.	[L1][CO5]	[2M]
	c	Define Poisson's ratio.	[L1][CO5]	[2M]
	d	Define Creep.	[L1][CO5]	[2M]
	e	Define Shrinkage.	[L1][CO5]	[2M]
2	a	Draw the typical stress-strain curve of concrete and explain the various modulus of elasticity.	[L3][CO5]	[5M]
	b	How do the type of aggregate, high water-cement ratio and time affect the modulus of elasticity?	[L2][CO5]	[5M]
3		Explain the procedure to conduct Modulus of elasticity test in the laboratory and explain the various factors affecting the modulus of elasticity.	[L2][CO5]	[10M]
4		Describe the relationship between time and creep, explaining the three stages of creep and how the creep rate changes over time.	[L2][CO5]	[10M]
5		Analyze the effects of concrete creep on structural performance, and how do these effects influence the design and long-term behavior of concrete structures?	[L3][CO5]	[10M]
6		Explain Creep of concrete and relation between creep and time.	[L2][CO5]	[10M]
7	a	Briefly explain the factors that influence the creep of concrete.	[L1][CO5]	[5M]
	b	How to prevent creep of concrete in structures to maintain strength.	[L2][CO5]	[5M]
8	a	What are the factors that affect the shrinkage of concrete?	[L1][CO5]	[5M]
	b	How does strength of concrete influence the modulus of elasticity and Poisson's ratio of concrete?	[L2][CO5]	[5M]
9		Discuss briefly about Nature of creep and explain different stages of creep.	[L2][CO5]	[10M]
10		How the shrinkage of concrete is classified? And explain each one of them briefly.	[L2][CO5]	[10M]
11	a	Define shrinkage of concrete?	[L1][CO5]	[4M]
	b	Explain the various factors affecting shrinkage of concrete.	[L2][CO5]	[6M]

UNIT –V
MIX DESIGN AND SPECIAL CONCRETES

1	a	What is meant by Special concrete?	[L1][CO6]	[2M]
	b	List different materials used for self-healing concrete.	[L1][CO6]	[2M]
	c	Define high performance concrete.	[L1][CO6]	[2M]
	d	Explain the standard mix of concrete.	[L2][CO6]	[2M]
	e	Explain the quality control of concrete.	[L2][CO6]	[2M]
2	a	Write applications of Fibre Reinforced concrete?	[L1][CO6]	[5M]
	b	Discuss various factors that affect the properties of Fibre Reinforced concrete?	[L2][CO6]	[5M]
3		Describe the different types of fibers used in Fiber Reinforced Concrete (FRC), explaining their advantages in improving concrete properties.	[L2][CO6]	[10M]
4		Explain briefly about High performance concrete and also the advantages of high performance concrete over conventional concrete?	[L2][CO6]	[10M]
5	a	Explain self-healing concrete and bacterial concrete?	[L2][CO6]	[5M]
	b	Define self-consolidating concrete? What are the materials used for SCC?	[L2][CO6]	[5M]
6		Discuss various factors which affect the choice of mix proportions?	[L2][CO6]	[10M]
7		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]
8		Design a M40 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 - 3.15 B. Sand - 2.68 C. Coarse aggregate - 2.71 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]
9		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]	[10M]
10	a	Explain the mix design procedure of concrete as per ACI code Method.	[L2][CO6]	[5M]
	b	Explain quality control of concrete and durability of concrete.	[L2][CO6]	[5M]
11	a	Define the term “Mix Design of Concrete” and explain its significance	[L2][CO6]	[5M]
	b	Explain the mix design procedure of concrete as per IS code Method.	[L2][CO6]	[5M]