

VALLIAMMAI ENGINEERING COLLEGE
SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF CIVIL ENGINEERING
QUESTION BANK



VI SEMESTER

CE 6002 CONCRETE TECHNOLOGY
Regulation – 2013

Academic Year 2018 – 19

Prepared by

Mrs.S.Mohanasundari, Assistant Professor(S.G) / CIVIL

Mr.S.Suresh babu, Assistant Professor/ CIVIL

Ms.Mr.R.Karthick, Assistant Professor/ CIVIL



VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203.



DEPARTMENT OF CIVIL ENGINEERING
QUESTION BANK

SUBJECT : CE 6002 CONCRETE TECHNOLOGY

SEM / YEAR: VI/III

UNIT 1 CONSTITUENT MATERIALS

Cement-Different types-Chemical composition and Properties -Tests on cement-IS Specifications-Aggregates-Classification-Mechanical properties and tests as per BIS grading requirements-Water- Quality of water for use in concrete.

PART – A

Q.No	Questions	BT Level	Competence
1	List the types of cement.	BT-1	Remember
2	Identify methods of proportioning of concrete mixes?	BT-1	Remember
3	Tell about the steps adopted to control bleeding.	BT-1	Remember
4	What is meant by 53 grade cement	BT-1	Remember
5	Define hydration of cement?	BT-1	Remember
6	Define Segregation.	BT-1	Remember
7	Describe bulking of sand?	BT-2	Understand
8	Summarize the methods adopted to avoid segregations of concrete.	BT-2	Understand
9	Classify factors affecting workability?	BT-2	Understand
10	Summarize the methods of consolidation or compaction of concrete	BT-2	Understand
11	Write the qualities of water to be used in concrete making?	BT-3	Application
12	Name the types of joints in concrete	BT-3	Application
13	Illustrate the factors affecting proportioning of concrete mixes.	BT-3	Application
14	What is meant by grading of aggregates?	BT-4	Analyze
15	Point out the compounds of ordinary Portland cement and mention the approximate percentage of each	BT-4	Analyze
16	Explain what workability is.	BT-4	Analyze
17	Comment on mixing of concrete.	BT-5	Evaluate
18	Conclude the need for Curing in concrete.	BT-5	Evaluate
19	Mention the different types of tests conducted on coarse aggregate	BT-6	Create
20	Formulate the advantages of sulphate resistance cement	BT-6	Create

PART –B			
1	(i) Describe the importance of the quality of water used for concreting? (7) (ii) List the various types of cement indicating their use for different applications. (6)	BT-1	Remember
2	(i) Explain in details the different tests employed for cement to ascertain its quality as per IS specification. (8) (ii) What is soundness of cement and how is it tested? (5)	BT-1	Remember
3	What is the effect of the maximum size of aggregate on concrete strength?	BT-1	Remember
4	List the various tests conducted on coarse aggregate indicating the property being tested.	BT-1	Remember
5	Summarize the dry process of manufacture of ordinary cement.	BT-2	Understand
6	Briefly explain various types of cements, grades and their characteristics.	BT-2	Understand
7	Discuss in in details various stages of manufacturing of cement concrete.	BT-2	Understand
8	(i) Illustrate and explain the raw materials for the manufacture of cement? Mention their functions in the properties of cement (8) (ii) Explain the role of various major compounds of cement and its hydrated products in the properties of cement (5)	BT-3	Application
9	Explain with the help of a neat sketch, the wet process of manufacture of ordinary cement.	BT-3	Application
10	Criticize about the following (i) Uniform grading (4) (ii) Gap grading (3) (iii) Continuous grading. (3)	BT-4	Analyze
11	(i) Classify any two methods of finding the abrasion value of a coarse aggregate (10) (ii) Explain the requirements of physical and mechanical properties of good coarse aggregate for concreting (3)	BT-4	Analyze
12	Explain in detail about the tests conducted to determine, and (i) Crushing value (5) (ii) Impact value (4) (iii) Abrasion value of aggregates. (4)	BT-4	Analyze
13	(i) Justify the characteristics of good aggregates (3) (ii) Evaluate the tests on coarse aggregate (10)	BT-5	Evaluate
14	What are the effects of the shape and texture of aggregates on the strength and workability of concrete	BT-6	Create
PART-C			
1	Explain briefly the role played by gypsum in the hydration reaction of cement	BT-1	Remember
2	What are the important chemical tests conducted on cement to determine its quality	BT-2	Understand
3	Explain the test involved in aggregates as per IS	BT-3	Application
4	Discuss about alkali aggregate reaction in detail	BT-4	Analyze

UNIT – 2 CHEMICAL AND MINERAL ADMIXTURES

Accelerators-Retarders- Plasticisers- Super plasticizers- Water proofers - Mineral Admixtures like Fly Ash, Silica Fume, Ground Granulated Blast Furnace Slag and Metakaoline -Their effects on concrete properties.

PART – A

Q.No	Questions	BT Level	Competence
1	Define admixtures.	BT-1	Remember
2	What is meant by pozzolanic action?	BT-1	Remember
3	List types of Admixtures?	BT-1	Remember
4	What is plasticizer?	BT-1	Remember
5	List the four main purposes of chemical admixtures using concrete?	BT-1	Remember
6	State the advantages and disadvantages of using superplasticizer in concrete	BT-1	Remember
7	Describe the term metakaoline.	BT-2	Understand
8	Discuss the purpose of adding admixture in concrete?	BT-2	Understand
9	Explain what is a chemical admixture?	BT-2	Understand
10	Summarize about Mineral admixtures.	BT-2	Understand
11	Illustrate the admixtures available in India?	BT-3	Application
12	Write any two chemical admixtures and their significance.	BT-3	Application
13	Illustrate the various admixtures used other than chemical and mineral admixtures?	BT-3	Application
14	Differentiate accelerators and retarders	BT-4	Analyze
15	Explain about Air entraining agents.	BT-4	Analyze
16	Analyze the use of water repelling agents?	BT-4	Analyze
17	Describe the importance of water proofers added in cement concrete	BT-5	Evaluate
18	Evaluate the purpose of retarders?	BT-5	Evaluate
19	Compare plasticizer and super plasticizer.	BT-6	Create
20	Write about artificial pozzolanas?	BT-6	Create

PART – B

1	Define is super plasticizers? What are the classifications of super plasticizers	BT-1	Remember
2	(i) Name the important purposes for which admixtures are used? (3) (ii) List the general classification of concrete chemicals according to their effects? (10)	BT-1	Remember
3	Describe the effects of adding fly ash, silica fume, and ground granulated blast furnace slag in concrete	BT-1	Remember
4	Outline the detail about super plasticizers, its mechanism and benefits.	BT-1	Remember
5	(i) Describe the effect of following admixtures on cement concrete and give three examples of each. Retarders, accelerators and water proofers (8) (ii) Explain about fly and GGBS (5)	BT-2	Understand

6	Explain in details about the types of mineral admixtures	BT-2	Understand
7	Summarize the admixtures in detail.	BT-2	Understand
8	(i) Mention some of the construction chemicals. (10) (ii) Write short notes on retarders. (3)	BT-3	Application
9	(i) Illustrate briefly about the effects of adding mineral admixtures to cement concrete (8) (ii) Write about super plasticizers? How are these helpful in modifying the properties of concrete (5)	BT-3	Application
10	Differentiate between the accelerators and retarders with suitable examples and also how you can determine dosage of admixtures	BT-4	Analyze
11	Describe the mechanism of action of retarders	BT-4	Analyze
12	Illustrate the effect of concrete properties while adding silica fume and GGBS	BT-4	Analyze
13	(i) Summarize the various types of plasticizer used in concrete and discuss the action in detail (7) (ii) Explain the materials used for air entrainment in concrete and describe their effects on the properties of concrete (6)	BT-5	Evaluate
14	(i) Why are chloride based accelerators not used in pre-stressed concrete structures? (8) (ii) How are mineral admixtures classified? (5)	BT-6	Create
PART-C			
1	Compare plasticizer and super plasticizer	BT-1	Remember
2	Summarize any four pozzolanic admixtures.	BT-2	Understand
3	Distinguish between pozzolanic and or cementitious admixtures.	BT-3	Application
4	What are the different chemicals used to obtain the desired colours on a concrete surface?	BT-4	Analyze

UNIT – 3

Principles of Mix Proportioning-Properties of concrete related to Mix Design-Physical properties of materials required for Mix Design- Design Mix and Nominal Mix-BIS Method of Mix Design – Mix Design Examples

Part A

Q.No	Questions	BT Level	Competence
1	Define Mix design?	BT-1	Remember
2	What is the objectives of concrete mix design	BT-1	Remember
3	Describe about statistical quality control	BT-1	Remember
4	Recall about principle of mix proportioning.	BT-1	Remember
5	What is the Minimum grade of concrete to be used as per IS-456?.How surface sture of aggregates is accounted for in the mix design?	BT-1	Remember
6	Tell about factors to be considered for mix design.	BT-1	Remember
7	Summarize the term nominal mix and design mix.	BT-2	Understand
8	Explain the methods concrete mix design for ordinary concrete?	BT-2	Understand
9	Describe requirements of concrete mix design?	BT-2	Understand
10	Classify various factors affecting proportioning of concrete mixes?	BT-2	Understand
11	Sketch the advantages of Design mix?	BT-3	Application
12	Write any four grades of cement concrete?	BT-3	Application
13	On what circumstances high grade concrete are utilized effectively?	BT-3	Application
14	Differentiate average design strength and specified minimum strength	BT-4	Analyse
15	Point out the disadvantages of nominal mix.	BT-4	Analyse
16	Explain the techniques related to mix design?	BT-4	Analyse
17	Prepare the advantages of a design mix in comparison with normal mix	BT-5	Evaluate
18	Evaluate the physical properties of materials required to mix design.	BT-5	Evaluate
19	Write the essential features of grading of concrete.	BT-6	Create
20	Explain about data used for ACI.	BT-6	Create

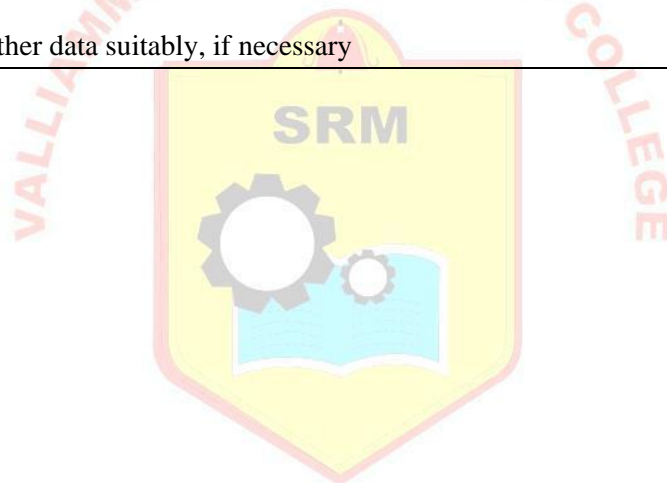
PART –B

1	Describe the procedure step by step procedure of ACI method of mix design	BT-1	Remember
2	What are the factors affecting proportioning of a concrete mix? Discuss each in detail.	BT-1	Remember
3	Explain the procedure of selection of constituent materials of concrete.	BT-1	Remember
4	Tell about parameters to be considered while designing a concrete.	BT-1	Remember
5	(i)Write a note on defects of the currently used method of mix proportioning in India? (ii)How can it be made more scientific?	BT-2	Understand
6	Differentiate between nominal mix and design mix.	BT-2	Understand

7	Discuss the various methods of proportioning.	BT-2	Understand
8	Describe in detail about the procedure for IS method of mix design.	BT-3	Application
9	<p>Design a Concrete Mix of M40 grade of concrete using IS method with the following data</p> <p>(i) Type of Cement : OPC 43 grade (ii) Maximum Size of Aggregate :20mm (iii) Exposure Condition – Severe (RCC) (iv) Workability – 125mm slump (v) Minimum Cement content – 320 kg/m³ (vi) Maximum W/C - 0.45 (vii) Method of Placing concrete : Pumping (viii) Degree of Supervision : Good (ix) Type of Aggregate : Crushed angular aggregate (x) Super plasticizer will be used (xi) Specific gravity of Coarse Aggregate : 2.80 (xii) Specific gravity of Coarse Aggregate : 2.70 (xiii) Specific gravity of Fly ash : 2.2 (xiv) Water absorption ,CA-0.5%,FA-nil Grading of Coarse aggregate is conforming of Table 2 of IS 383 And grading of FA is falling in Zone-1</p>	BT-3	Application
10	Distinguish between the term sampling and acceptance criteria in proportioning of concrete mix	BT-4	Analyse
11	Compare ACI and IS method of concrete mix design.	BT-4	Analyse
12	<p>Design a concrete mix for the following requirements using IS method. Also find The mix proportions by weight and by volume. M40 grade ,OPC cement, sp gravity – 3.15, bulk density – 1440kg/m³, sand –grading zone I ,sp gravity – 2.65,bulkdensity– 1610kg/m³ Coarse aggregate – 10mm angular, sp gravity – 2.66, bulk density– 1580kg/m³ Degree of workability – 0.85 compacting factor, quality control– very good</p>	BT-4	Analyse
13	How will you account for the moisture present in sand while mix proportioning?	BT-5	Evaluate
14	<p>Design a Concrete Mix of M30 grade of concrete using F type Fly ash adopt BIS method with the following data</p> <p>(i) Type of Cement : OPC 43 grade (ii) Maximum Size of Aggregate :20mm (iii) Exposure Condition – Severe (RCC) (iv) Workability – 100 mm slump (v) Minimum Cement content – 320 kg/m³ (vi) Maximum W/C - 0.46 (vii) Method of Placing concrete : Pumping (viii) Degree of Supervision : Good (ix) Type of Aggregate : Crushed angular aggregate (x) Super plasticizer will be used (xi) Specific gravity of Coarse Aggregate : 2.80 (xii) Specific gravity of Coarse Aggregate : 2.70 (xiii) Specific gravity of Fly ash : 2.2 (xiv) Water absorption ,CA-0.5%, FA-nil Grading of Coarse aggregate is conforming of Table 2 of IS 383 and grading of FA is falling in Zone-1</p>	BT-6	Create

PART-C

1	Distinguish between the term sampling and acceptance criteria in proportioning of concrete mix.	BT-5	Evaluate
2	Design a concrete mix by BIS method with the following data Characteristics compressive strength = 35N/mm ² Maximum size of aggregate = 20mm (angular) Fine aggregates conform to grading zone II Degree of workability = 0.80 Degree of quality control = Good, Type of exposure = Mild Specific gravity of cement = 3.14 Specific gravity of fine aggregate = 2.58 Water absorption (i) Coarse aggregate = 1.9% (ii) Fine aggregate NIL (iii) Water cement ratio = 0.48 Assume any other data if necessary. Also calculate the quantity of cement, sand, coarse aggregate and water required per cubic metre of concrete.	BT-4	Analyse
3	Design a concrete mix for construction of an elevated water tank. The specified design strength of concrete is 30mpa at 28 days measured on standard cylinders. Standard deviation can be taken as 4mpa. The specific gravity of FA and CA are 2.65 and 2.7 respectively. The dry rodded bulk density of CA is 1600 kg/m ³ and fineness modulus of FA is 2.8. opc used A slump of 50mm is necessary. CA is found to be absorptive to the extent of 1% and free surface moisture in sand is found to be 2%. Assume any other data	BT-6	Create
4	Design a concrete mix for M20 concrete for the following data by ACI method. Specific gravity of ordinary Portland cement = 3.15 Specific gravity of fine aggregate = 2.65 Specific gravity of coarse aggregate = 2.70 Standard deviation = 4 N/mm ² Dry rodded bulk density of CA=1600kg/m ³ Fineness modulus = 2.80 Slump=50mm Assume any other data suitably, if necessary	BT-3	Application



UNIT – 4 FRESH AND HARDENED PROPERTIES OF CONCRETE

Workability-Tests for workability of concrete-Slump Test and Compacting factor Test-Segregation and Bleeding-
 ermination of Compressive and Flexural strength as per BIS - Properties of Hardened concrete-Determination of
 ompressive and Flexural strength-Stress-strain curve for concrete-Determination of Young's Modulus.

PART -A

Q.No	Questions	BT Level	Competence
1	What is concrete?	BT-1	Remember
2	Define workability.	BT-1	Remember
3	Tell about quality of concrete?	BT-1	Remember
4	What are the important parameters of workability?	BT-1	Remember
5	Define the term compacting factor.	BT-1	Remember
6	What are the advantages of Ring tension test ?	BT-1	Remember
7	Summarize the factors affecting workability?	BT-2	Understand
8	Explain segregation.	BT-2	Understand
9	Describe about bleeding water percentage?	BT-2	Understand
10	Report the various stages of manufacturing of concrete?	BT-2	Understand
11	Classify the methods for transportation of concrete?	BT-3	Application
12	Classify the methods are adopted for compacting the Concrete?	BT-3	Application
13	Illustrate the methods used for curing?	BT-3	Application
14	List out the NDT test?	BT-4	Analyse
15	Point out the factors influencing workability & Strength of concrete?	BT-4	Analyse
16	Criticize the term Bleeding?	BT-4	Analyse
17	Comment on the term creeping concrete?	BT-5	Evaluate
18	Evaluate the reasons for shrinkage of concrete.	BT-5	Evaluate
19	Explain about dynamic modulus.	BT-6	Create
20	Write the different tests for workability of concrete.	BT-6	Create

PART -B

1	What are the various factors which affecting the workability of concrete? Explain.	BT-1	Remember
2	(i) What is re-vibration? (3) (ii) Is it detrimental to concrete? (7) (iii) Where is it practiced? (3)	BT-1	Remember

--

3	Discuss the following tests for concrete: (i) Flow test (6) (ii) slump test (7)	BT-1	Remember
4	Tell in detail about the practical significance of stress-strain curve for concrete?	BT-1	Remember
5	Explain the factors influencing the strength of concrete.?	BT-2	Understand
6	(i) Explain Durability of concrete? (6) (ii) Factor affecting durability of concrete? (7)	BT-2	Understand
7	Describe the relationship between the strength and density of Concrete?	BT-2	Understand
8	Explain the procedure of compressive, tensile & flexure strength tests conducted on cement concrete elements with neat sketch.	BT-3	Application
9	(i) Describe the methods used to test the hardened concrete (7) (ii) Explain how will you determine the modulus of elasticity of concrete .experimentally (8)	BT-3	Application
10	Explain in detail about (i) maturity of concrete (4) (ii) How is it measured? (5) (iii) What are its practical uses in the concrete industry?(4)	BT-4	Analyse
11	Compare the relative merits and demerits of various workability tests.	BT-4	Analyse
12	Explain Under what circumstances is concrete subjected to fatigue stresses?	BT-4	Analyse
13	Define the term workability. What are the various tests conducted to determine the Workability of concrete and explain them.	BT-5	Evaluate
14	Write short notes on (i)Elasticity of concrete (4) (ii)Shrinkage (4) (iii) Creep (5)	BT-6	Create
PART –C			
1.	What are the two non-destructive tests commonly used to assess the compressive strength? Explain any one method.	BT-4	Analyse
2.	(i) Describe the importance of curing? (5) (ii) When should it be commenced? (5) (iii) For how long should it be continued? (5)	BT-1	Remember
3.	Explain the methods of finding the flexural and split tensile strength for concrete.	BT-5	Analyse
4.	Discuss the beneficial and harmful effects of creep of concrete?	BT-6	Create

UNIT – 5 SPECIAL CONCRETES

Light weight concretes - High strength concrete - Fibre reinforced concrete – Ferrocement – Ready mix concrete
- SIFCON-Shotcrete – Polymer concrete - High performance concrete- Geopolymer Concrete

Part A

Q.No	Questions	BT Level	Competence
1	List out any two advantages of geopolymer concrete.	BT-1	Remember
2	Define High performance concrete.	BT-1	Remember
3	What is Polymer Concrete? State its advantages	BT-1	Remember
4	Tabulate the factors affecting the properties of fibre reinforced concrete?	BT-1	Remember
5	List out current development of fibre reinforced concrete.	BT-1	Remember
6	What are the special methods of making high strength concrete?	BT-1	Remember
7	Summarize the factors to be depending upon the depth of monomer penetration?	BT-2	Understand
8	Explain about ferrocement?	BT-2	Understand
9	Describe the various types concrete used?	BT-2	Understand
10	Summarize the advantages of fibre reinforced concrete.	BT-2	Understand
11	Classify the types of artificial light weight aggregate?	BT-3	Application
12	Illustrate the properties of polymer impregnated concrete.	BT-3	Application
13	Classify the different methods producing light weight concrete.	BT-3	Application
14	Differentiate between high performance concrete and geopolymer concrete.	BT-4	Analyse
15	What is meant by light weight concrete?	BT-4	Analyse
16	Explain the high strength concrete is used for concrete repairs?	BT-4	Analyse
17	Comment on high density concrete.	BT-5	Evaluate
18	Comment on Different types of fibres used in concrete	BT-5	Evaluate
19	Write about SIFCON.	BT-6	Create
20	Write about hot weather concreting	BT-6	Create

PART – B

1	Examine High Performance concrete. Explain the properties and application	BT-1	Remember
2	What meant by Ready Mix Concrete? Explain their advantages and disadvantages?	BT-1	Remember
3	Explain the following. (i) Light Weight concrete (ii) Fibre Reinforced Concrete (iii) Polymer Concrete (iv) High Strength Concrete	BT-1	Remember
4	List out the problems encountered in hot weather concreting? What are the	BT-1	Remember

	Precautions included in hot weather concreting?		
5	Explain the problems encountered in cold weather concreting? What are the Precaution included in cold weather concreting	BT-2	Understand
6	Explain detailed about Light weight concrete and its types	BT-2	Understand
7	Explain the Sulphur infiltrated concrete in detail	BT-2	Understand
8	Illustrate the various properties of SIFCON concrete and explain them in detail	BT-3	Application
9	Illustrate the fresh state properties of high-strength concrete	BT-3	Application
10	Analyse lightweight concrete preferred for construction particulars in multi-storey building? Explain with respect to their physical characteristics of lightweight aggregate concrete.	BT-4	Analyse
11	Compare light weight concrete and high strength concrete.	BT-4	Analyse
12	(i) What is Shotcrete? Explain the procedure of Shotcreting a surface. (ii) What is Fibre reinforced concrete? What are its advantages? .Explain in detail.	BT-4	Analyse
13	Evaluate long term properties of high strength concrete? Compare them with those of conventional concrete.	BT-5	Evaluate
14	Give a list of laboratory equipment required to ensure the quality of ready mixed concrete supplied to the contractor.	BT-6	Create
PART –C			
1	Explain the following. (i) Ferrocement Concrete (ii) High Performance Concrete (iii) Geopolymer Concrete (iv) Shotcrete	BT-1	Remember
2	Write notes on Ready mix concrete.	BT-4	Analyse
3	What are basic properties of fibre-reinforced concrete which can be advantageously made use of in the design of structural elements?	BT-6	Create
4	Illustrate about High strength of concrete and Fibre reinforced concrete	BT-2	Understand

