

VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF CIVIL ENGINEERING QUESTION BANK



VI SEMESTER
CE 6002 CONCRETE TECHNOLOGY
Regulation – 2013
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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 the function of gypsum in the manufacture of 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 about admixtures.	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	Analyse
15	Point out the types of mortars.	BT-4	Analyse
16	Explain what workability is.	BT-4	Analyse
17	Comment on mixing of concrete.	BT-5	Evaluate
18	Conclude the need for Curing in concrete.	BT-5	Evaluate
19	Mention the test adopted to test the properties of cement in laboratories	BT-6	Create
20	Formulate the test adopted to test the properties of cement in field?	BT-6	Create

PART -B

1	(i) Describe the importance of the quality of water used for concreting? (3) (ii) List the various types of cement indicating their use for different Applications. (10)	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 details various stages of manufacturing of cement concrete.	BT-2	Understand
8	Illustrate and explain various types of cement indicating their use for different applications.	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	Analyse
11	What are the different moisture states in which aggregates exist?	BT-4	Analyse
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	Analyse
13	How does increasing the quality of water influence the properties of fresh and hardened concrete?	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	Analyse

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 the necessity of use admixture?	BT-1	Remember
3	List types of Admixtures?	BT-1	Remember
4	What are plasticizers?	BT-1	Remember
5	List the four main purposes of chemical admixtures using concrete?	BT-1	Remember
6	Recall what are Super plasticizers?	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 are chemical admixtures?	BT-2	Understand
10	Summarize about Mineral admixtures.	BT-2	Understand
11	Illustrate the admixtures available in India?	BT-3	Application
12	Write a list of few mineral admixtures.	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	Analyse
15	Explain about Air entraining agents.	BT-4	Analyse
16	Analyse the use of water repelling agents?	BT-4	Analyse
17	Support the purpose of providing DPC in buildings	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	Describe the mechanism of action of retarders	BT-4	Analyse
3	(i) What are the important purposes for which admixtures are used? (ii) List the general classification of concrete chemicals according to Their effects?	BT-3	Application
4	Explain in details about the types of mineral admixtures.	BT-2	Understand
5	Explain in detail about plasticizers, its mechanism and benefits.	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. (ii)Write short notes on retarders.	BT-3	Application
9	How does a surface –active agent increase workability?	BT-3	Application
10	List the corrosion inhibiting agents and briefly explain any one of them	BT-4	Analyse

11	How does a surface –active agent increase workability?	BT-4	Analyse
12	Why do superplasticizers perform better than surface-active agents?	BT-4	Analyse
13	What method will you adopt to cure concrete in areas of water shortage?	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 supper plasticizer	BT-1	Remember
2.	Distinguish between pozzolanic and or cementitious admixtures.	BT-3	Application
3.	What are the different chemicals used to obtained the desired colours on a concrete surface?	BT-4	Analyse
4.	Summarize any four pozzolanic admixtures.	BT-2	Understand



UNIT – 3

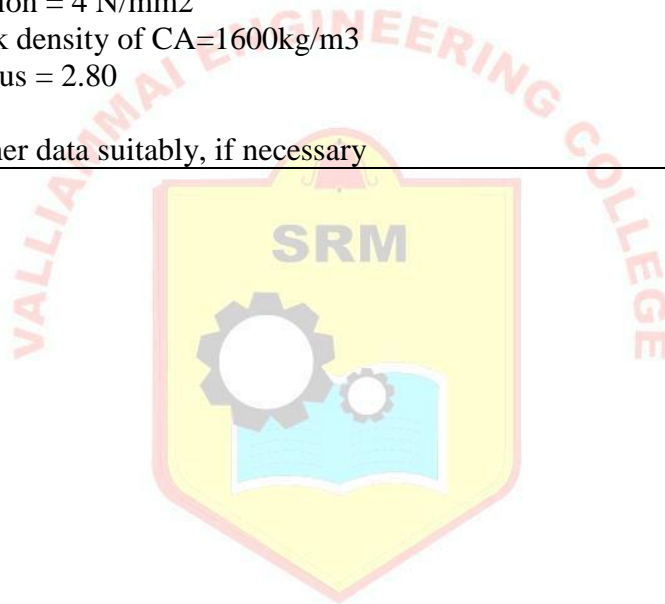
Principles of Mix Proportioning-Properties of concrete related to Mix Design-Physical properties of materials required for Mix Design - Design Mix and Nominal Mix-BIS Method of Mix Design – Mix Design Examples

Part A

Q.No	Questions	BT Level	Competence
1	What is the objectives of concrete mix design	BT-1	Remember
2	Define 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 are various methods of proportioning?	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	Classify different types concrete mixes.	BT-3	Application
13	Illustrate the operations involved statistical quality control?	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 is the factors affecting proportioning of a concrete mix? Discuss each in detail.	BT-1	Remember
3	Explain with flow chart the procedure involved in tunneling techniques.	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	Design a concrete mix which is required to have a specified mean strength of 30 Mpa at 28 days. The presence of reinforcement requires a slump of 75mm and a maximum size of aggregate of 10mm. The aggregate are of normal weight and their grading conform to the approximate standard with a fineness modulus of 2.8. Assume negligible absorption and moisture content, bulk density of coarse aggregate 1600 Kg/m ³ and extreme exposure conditions. Use ACI method.	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	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/m ³ , sand – grading zone I , sp gravity – 2.65, bulk density – 1610kg/m ³ Coarse aggregate – 10mm angular, sp gravity – 2.66, bulk density – 1580kg/m ³ Degree of workability – 0.85 compacting factor, quality control – very good	BT-4	Analyse
13	How will you account for the moisture present in sand while mix proportioning.	BT-5	Evaluate
14	Design a concrete mix for construction of an elevated water tank. The specified design strength of concrete is 30 MPa at 28 days measured on standard cylinders. Standard deviation can be taken as 4 MPa. The specific gravity of FA and CA are 2.65 and 2.7. The dry rodded bulk density of CA is 1600 kg/m ³ and fineness Modulus of FA IS 2.80. A slump of 50mm is necessary moisture content of sand is 2% and water absorption of CA is 1%.	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 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	<p>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/m³ 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</p>	BT-6	Create
4	<p>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/mm² Dry rodded bulk density of CA=1600kg/m³ Fineness modulus = 2.80 Slump=50mm Assume any other data suitably, if necessary</p>	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-Determination of Compressive and Flexural strength as per BIS - Properties of Hardened concrete- Determination of Compressive 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 tests are used the measurement of workability?	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 cracks in concrete?	BT-4	Analyse
16	Criticize the term Bleeding?	BT-4	Analyse
17	Comment on the term creep in 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	Summarize and explain the methods used for testing Hardened 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	Illustrate various types of bridges? Explain with neat sketch.	BT-3	Application
9	Demonstrate the age factor not taken advantage of in IS 456-2000? Comment	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 shortnotes 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 phenomenon of shrinkage of 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

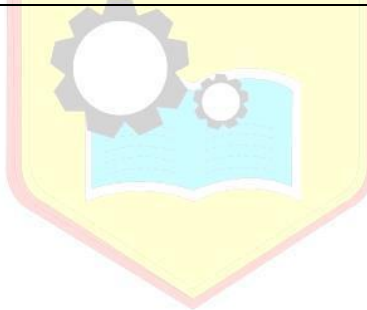
Part A

Q.No	Questions	BT Level	Competence
1	List the 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 pumice?	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	Point out types of natural light weight aggregates?	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 vacuum concrete.	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	Describe ready mixed concrete, high density concrete, fibre reinforced Concrete, light weight concrete and polymer concrete.	BT-1	Remember
4	List out the problems encountered in hot weather concreting? What are the Precautions included in hot weather concreting?	BT-1	Remember
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	Analyse aspects of HPC that are related to strength and durability separately	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	Illustrate Polymer, High performance of concrete and Geo polymer concrete	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





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CE 6002 CONCRETE TECHNOLOGY QUESTION BANK

S.no	UNIT NO.		BT1	BT2	BT3	BT4	BT5	BT6	Total Question
1	Unit-1	Part-A	6	4	3	3	2	2	20
		Part-B	4	3	2	3	1	1	14
		Part-C	1	1	1	1			4
2	Unit-2	Part-A	6	4	3	3	2	2	20
		Part-B	4	3	2	3	1	1	14
		Part- C	1	1	1	1			4
3	Unit-3	Part-A	6	4	3	3	2	2	20
		Part-B	4	3	2	3	1	1	14
		Part- C			1	1	1	1	4
4	Unit-4	Part-A	6	4	3	3	2	2	20
		Part-B	4	3	2	3	1	1	14
		Part- C	1			1	1	1	4
5	Unit-5	Part-A	6	4	3	3	2	2	20
		Part-B	4	3	2	3	1	1	14
		Part- C	1	1		1		1	4

TOTAL NO.OF QUESTIONS IN EACH PART	
PART A	100
PART B	70
PART C	20
TOTAL	190