



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad -500 043

CIVIL ENGINEERING

QUESTION BANK

Course Title	:	CONCRETE TECHNOLOGY			
Course Code	:	A50116			
Regulation	:	R15(JNTUH)			
Class	:	III - B. Tech, I Sem			
Course Structure	:	Lectures	Tutorials	Practical's	Credits
		4	-	-	4
Course Coordinator	:	Mr. Suraj Baraik, Assistant Professor, Civil Engineering Mr. N Venkat Rao, Assistant Professor, Civil Engineering			
Team of Instructors	:	Mr. Suraj Baraik, Assistant Professor, Civil Engineering Mr. N Venkat Rao, Assistant Professor, Civil Engineering			

OBJECTIVES

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

UNIT I

CEMENT AND ADMIXTURES

Part – A (SHORT QUESTION)

S.No.	QUESTION	BLOOM'S TAXONOMY LEVEL	COURSE OUTCOME
1	What is the chemical composition of cement?	Remember	1
2	List various types of cement.	Remember	1
3	What is grade of cement? List any three grades of cement with their strengths.	Understand	1
4	Give step by step method of manufacture of cement by wet process.	Understand	1
5	What is the common classification of aggregates?	Understand	2
6	What are the properties of Aggregate?	Remember	2
7	What are the Physical Quality requirements of aggregates?	Remember	1
8	Distinguish between plasticizers and super plasticizers.	Understand	2
9	Distinguish between natural and chemical admixtures.	Understand	3
10	What is meant by hydration of cement?	Understand	4

11	What is the percentage of water required, if 1500 g of water is required to have a cement paste of 1875 g of normal consistency?	Understand	1
12	Which cement is preferred for construction in sea water?	Understand	3
13	How does alkali aggregate reaction affect the concrete mix?	Understand	2
14	Why does hydration of cement occur?	Understand	4
15	At what temperature is slurry burnt in a rotary kiln?	Understand	3
16	What is the maximum amount of dust which may be permitted in aggregates?	Understand	2
17	On which factors the bulk density of aggregates does not depend upon?	Understand	1
18	How does alkali aggregate reaction affect concrete?	Understand	3
19	If 20 kg of coarse aggregate is sieved through 80 mm, 40 mm, 20 mm, 10 mm, 4.75 mm, 2.36 mm, 1.18 mm, 600 micron, 300 micron and 150 micron standard sieves and the weights retained are 0 kg, 2 kg, 8 kg, 6 kg, 4 kg respectively, what is the fineness modulus of the aggregate?	Understand	4
20	If X, Y and Z are the fineness moduli of coarse, fine and combined aggregates, what is the percentage (P) of fine aggregates to combined aggregates?	Understand	4

PART-B (LONG QUESTION)

1	Explain the different types of cement in detail.	Understand	2
2	Describe the setting time and soundness test of cement.	Understand	2
3	Explain the bulking phenomenon of aggregates.	Understand	1
4	Explain the procedure of determining '10 per cent fines value'. What is gap graded aggregate?	Understand	2
5	Describe the hydration reaction of Bogue compounds indicating the products of hydration.	Understand	2
6	How is compressive strength of cement determined?	Remember	1
7	Describe the test done to determine aggregate abrasion value.	Remember	3
8	Write briefly about Retarders.	Remember	1
9	Write short notes on Damp proofing agents	Remember	3
10	Describe Dry process of cement manufacturing.	Remember	2
11	Write short notes on Air entraining agents	Remember	1
12	Describe Wet process of cement manufacturing.	Remember	1
13	Write briefly about Accelerators.	Remember	1
14	Explain shape and texture of the aggregate?	Remember	1
15	Explain different types of admixtures?	Understand	1
16	Explain mechanical properties of aggregate?	Remember	2
17	Properties of mineral and chemical admixtures?	Understand	2
18	Explain Bond and Strength of the aggregate?	Remember	2
19	Write short note of thermal properties of aggregate?	Understand	1
20	What is grading of fine and coarse aggregate?	Remember	2

PART -C (ANALYTICAL QUESTION)

S. No	Questions	Blooms Taxonomy Level	Program Outcome
1	What is the percentage of water required, if 1500 g of water is required to have a cement paste of 1875 g of normal consistency?	Understand	3
2	Which cement is preferred for construction in sea water?	Understand	3
3	How does alkali aggregate reaction affect the concrete mix?	Understand	2
4	Why does hydration of cement occur?	Understand	1
5	At what temperature is slurry burnt in a rotary kiln?	Understand	1
6	What is the maximum amount of dust which may be permitted in Aggregates?	Understand	4
7	On which factors the bulk density of aggregates does not depend upon?	Understand	1
8	How does alkali aggregate reaction affect concrete?	Understand	1
9	If 20 kg of coarse aggregate is sieved through 80 mm, 40 mm, 20 mm, 10 mm, 4.75 mm, 2.36 mm, 1.18 mm, 600 micron, 300 micron and 150 micron standard sieves and the weights retained are 0 kg, 2 kg, 8 kg, 6 kg, 4 kg respectively, what is the fineness modulus of the aggregate?	Understand	2
10	If X, Y and Z are the fineness moduli of coarse, fine and combined aggregates, what is the percentage (P) of fine aggregates to combined aggregates?	Understand	1

UNIT II

FRESH CONCRETE

PART-A (SHORT QUESTION)

1	What is meant by proportioning of concrete?	Understand	1
2	Can sea water be used for making concrete? Explain.	Understand	1
3	What is meant by curing of concrete?	Understand	1

4	What is meant by controlled concrete?	Understand	2
5	Define Workability.	Remember	1
6	Mention the Properties of concrete at Early Ages.	Remember	1
7	What are the Causes of bleeding and segregation?	Understand	3
8	What are the Methods for Control of Bleeding?	Understand	4
9	Define segregation of concrete.	Remember	2
10	Define bleeding of concrete.	Remember	2
11	W_p and W_f are the weights of a cylinder containing partially compacted and fully compacted concrete. If the compaction factor is 0.95, what is the workability of concrete?	Understand	1
12	How can shrinkage in concrete be reduced?	Understand	3
13	What is the process of hardening the concrete by keeping its surface moist known as?	Understand	
14	Which grade of concrete not recommended by I.S. : 456 and why?	Understand	3
15	What does proper batching ensure?	Understand	3
16	Which method is used for compacting plain concrete road surface of thickness less than 20 cm?	Understand	2
17	How does segregation affect concrete?	Understand	1
18	What is separation of water or water sand cement from a freshly concrete?	Understand	3
19	How does high temperature affect fresh concrete?	Understand	4
20	How is workability of concrete mix with low water cement ratio determined?	Understand	2

PART-B (LONG QUESTION)

1	What is meant by workability?	Understand	2
2	Explain Flow test in detail.	Remember	1
3	What are the methods available for measuring air content in fresh concrete? Explain one of the methods in detail.	Remember	2
4	What are the various steps involved in concrete manufacturing?	Remember	1
5	What is segregation describe briefly?	Understand	3
6	What is bleeding and how can it be prevented?	Understand	2
7	How does freeze-thaw damage occur?	Understand	1
8	What is alkali-aggregate reaction? Explain.	Understand	1
9	Define re-vibration briefly?	Remember	1
10	Describe the importance of the quality of water used for concreting.	Understand	1
11	Explain Compaction factor test in detail.	Remember	2

12	What are the factors affecting workability of concrete?	Understand	2
13	Define measurement of workability by different tests?	Understand	1
14	Explain how can we be prevented segregation?	Remember	2
15	Describe the setting time of concrete?	Remember	1
16	What are the various vibration techniques used for concrete vibration?	Remember	1
17	What are the effects of time and temperature on workability?	Understand	2
18	Describe briefly about segregation?	Understand	1
19	What is mixing and vibration of concrete?	Understand	3
20	Describe briefly about bleeding?	Understand	1

PART -C (ANALYTICAL QUESTION)

S. No	Questions	Blooms Taxonomy Level	Program Outcome
1	How does water cement ratio affect the properties of hardened concrete?	Understand	2
2	Which factors lead to strength in hardened concrete?	Understand	2
3	How does gel space ratio affect the properties of hardened concrete?	Understand	3
4	In concrete compression test, normally 150mmx150mmx150mm concrete cube samples are used for testing. Why isn't 100mmx100mmx100mm concrete cube samples used in the test instead of 150mmx150mmx150mm concrete cube samples?	Understand	3
5	Is it desirable to use concrete of very high strength i.e. exceeding 60MPa? What are the potential problems associated with such high strength concrete?	Understand	3
6	In carrying out compression test for concrete, should test cubes or test cylinders be adopted?	Understand	4
7	Discuss the relationship between time and creep.	Understand	4
8	Why is the compressive strength of hardened concrete determined after 28 days?	Understand	4
9	What is the purpose of conducting non destructive tests?	Understand	5
10	How does creep affect hardened concrete?	Understand	1

UNIT III

HARDENED CONCRETE

PART-A (SHORT QUESTION)

1	Define Water/cement ratio.	Remember	2
2	What is meant by gel-space ratio?	Understand	3
3	Why is Elastic Moduli Important for Concrete?	Understand	1
4	Define Shrinkage cracking	Remember	3
5	Define Tension cracking	Remember	3
6	Define Creep.	Remember	1
7	Write short notes on the following: Acid attack	Understand	1
8	Write short notes on the following: Sulphate attack	Understand	1
9	Write short notes on the following: Alkali attack	Understand	1
10	Write short notes on the following: non destructive testing of concrete	Understand	2
11	Which factors lead to strength in hardened concrete?	Understand	3
12	How does water cement ratio affect the properties of hardened concrete?	Understand	1
13	How does gel space ratio affect the properties of hardened concrete?	Understand	4
14	In concrete compression test, normally 150mmx150mmx150mm concrete cube samples are used for testing. Why isn't 100mmx100mmx100mm concrete cube samples used in the test instead of 150mmx150mmx150mm concrete cube samples?	Understand	2
15	Is it desirable to use concrete of very high strength i.e. exceeding 60MPa? What are the potential problems associated with such high strength concrete?	Understand	1
16	In carrying out compression test for concrete, should test cubes or test cylinders be adopted?	Understand	2
17	Discuss the relation between creep and time.	Understand	3
18	Why is the compressive strength of hardened concrete determined after 28 days?	Understand	2
19	What is the purpose of conducting non destructive tests?	Understand	4
20	How does creep affect hardened concrete?	Understand	1

PART-B (LONG QUESTION)

1	What is Abram's law? How does it affect concrete?	Understand	2
2	What are the various factors affecting strength of hardened concrete?	Understand	2
3	What is curing? What are the different methods of curing?	Remember	1
4	Explain briefly about Tension test?	Remember	1
5	Write a short note on Flexural test	Remember	2
6	Explain nondestructive tests.	Understand	1
7	Write a short note on Elasticity of concrete	Remember	2
8	Write a short note on Creep	Remember	1
9	What is creep of concrete	Understand	3
10	What is shrinkage?	Remember	1

11	Explain briefly about Compression test?	Remember	3
12	Describe briefly about Split tensile test	Remember	2
13	Write a short note on Shrinkage	Remember	1
14	Write a short note on Durability of concrete	Remember	1
15	What are the factors influencing creep?	Remember	1
16	What is the relation between creep & time?	Remember	1
17	What are effects of creep?	Understand	1
18	What are the types of shrinkage?	Remember	2
19	What are the codal provisions for NDT?	Understand	2
20	Describe types of NDT tests?	Remember	2

PART -C (ANALYTICAL QUESTION)

S. No	Questions	Blooms Taxonomy Level	Program Outcome
1.	Which factors lead to strength in hardened concrete?	Understand	2
2.	How does water cement ratio affect the properties of hardened concrete?	Understand	2
3.	How does gel space ratio affect the properties of hardened concrete?	Understand	1
4.	In concrete compression test, normally 150mmx150mmx150mm concrete cube samples are used for testing. Why isn't 100mmx100mmx100mm concrete cube samples used in the test instead of 150mmx150mmx150mm concrete cube samples?	Understand	1
5.	Is it desirable to use concrete of very high strength i.e. exceeding 60MPa? What are the potential problems associated with such high strength concrete?	Understand	2
6.	In carrying out compression test for concrete, should test cubes or test cylinders be adopted?	Understand	2
7.	Discuss the relation between creep and time.	Understand	3
8.	Why is the compressive strength of hardened concrete determined after 28 days?	Understand	3
9.	What is the purpose of conducting non destructive tests?	Understand	3
10.	How does creep affect hardened concrete?	Understand	3

UNIT IV

MIX DESIGN

PART-A (SHORT QUESTION)

1	Define Concrete Durability.	Remember	1
2	Define concrete mix design.	Remember	2
3	What are the factors influencing the selection of materials?	Understand	1
4	What are the factors Influencing Consistency?	Understand	1
5	What are the Factors affecting Strength of Hardened concrete?	Understand	2
6	What is the sequence of steps should be followed in ACI method?	Remember	3
7	Mention the Maximum aggregate size to be used in Mix Design	Understand	4

	as per ACI.		
8	What are the Requirements of concrete mix design as per BIS?	Remember	2
9	Factors that influence the choice of mix design.	Understand	1
10	What are the Factors affecting the choice of mix proportions?	Understand	4
11	Describe about Sampling criteria	Understand	3
12	What is statistical quality control.	Understand	5
13	What is M20 Mix concrete.	Remember	5
14	Describe Acceptance criteria	Understand	2
15	Define Standard mixes.	Understand	1
16	What are the types of concrete mixes? Explain.	Understand	5
17	Define Nominal Mixes?	Understand	5
18	What is M30 Mix concrete.	Remember	4
19	What are Designed Mixes?	Understand	5
20	What is an acceptance criterion of concrete.	Understand	4

PART-B (LONG QUESTION)

1	Describe ACI method of mix design in detail.	Understand	1
2	Describe Indian standard method of mix design in detail.	Understand	1
3	Describe about the Sampling criteria?	Understand	2
4	Design the concrete mix for grade M20 with suitable conditions. Find the quantities of constituents of the mix for a bag of cement.	Evaluate	1
5	Explain the factors that influence the choice of mix design.	Understand	3
6	Explain in detail about the statistical quality control and acceptance criteria of concrete.	Understand	3
7	Design the concrete mix for grade M30 with suitable conditions. Find the quantities of constituents of the mix for a bag of cement.	Evaluate	1
8	Explain the procedure of selection of constituent materials of concrete.	Understand	2
9	Define Nominal Mixes and Standard mixes. What are Designed Mixes?	Understand	2
10	Describe the recent trends in concrete mix design.	Understand	2
11	Describe briefly about durability of concrete?	Understand	1
12	Describe quality control of concrete?	Understand	1
13	Describe about Acceptance criteria?	Understand	2
14	What is BIS method of mix design?	Understand	1
15	Design the concrete mix for grade M20 with suitable conditions. Find the quantities of constituents of the mix for a bag of cement.	Understand	3
16	Design the concrete mix for grade M30 with suitable conditions. Find the quantities of constituents of the mix for a bag of cement.	Understand	1
17	Design the concrete mix for the following data: characteristic compressive strength= 20MPa, maximum size of aggregate = 20mm (angular), Degree of workability = 0.9 CF, Degree of quality control = good and type of exposure = severe. Water absorption by CA = 0.5% and moisture content in FA = 2.0%. Assume any suitable missing data.	Understand	4
18	Design the concrete mix for the following data: characteristic compressive strength = 35MPa, maximum size of aggregate = 20mm (angular), Degree of workability = 0.9 CF, Degree of	Understand	4

	quality control = good and type of exposure = severe. Water absorption by CA = 1% and moisture content in FA = 1.5%. Assume any suitable missing data.		
19	Design the concrete mix for the following data: characteristic compressive strength=35mpa, maximum size of aggregate =20mm (angular), degree of workability=0.9CF, degree of quality control =good and type of exposure=severe. Water absorption by CA=1% and moisture content in FA =1.5%. Assume any suitable missing data.	Understand	4
	Design the concrete mix for the following data: characteristic compressive strength=20mpa, maximum size of aggregate =20mm (angular), degree of workability =0.9CF, degree of	Understand	4
20	quality control =good and type of exposure=severe. Water absorption by CA =0.5% and moisture concrete FA=2.0%. Assume any suitable missing data.		

PART-C (ANALYTICAL QUESTION)

1	Design the concrete mix for grade M20 with suitable conditions. Find the quantities of constituents of the mix for a bag of cement.	Understand	2
2	Design the concrete mix for grade M30 with suitable conditions. Find the quantities of constituents of the mix for a bag of cement.	Understand	2
3	Design the concrete mix for the following data: characteristic compressive strength= 20MPa, maximum size of aggregate = 20mm (angular), Degree of workability = 0.9 CF, Degree of quality control = good and type of exposure = severe. Water absorption by CA = 0.5% and moisture content in FA = 2.0%. Assume any suitable missing data.	Understand	3
4	Design the concrete mix for the following data: characteristic compressive strength = 35MPa, maximum size of aggregate = 20mm (angular), Degree of workability = 0.9 CF, Degree of quality control = good and type of exposure = severe. Water absorption by CA = 1% and moisture content in FA = 1.5%. Assume any suitable missing data.	Understand	1
5	Design the concrete mix for the following data: characteristic compressive strength=35mpa, maximum size of aggregate =20mm (angular), degree of workability=0.9CF, degree of quality control =good and type of exposure=severe. Water absorption by CA=1% and moisture content in FA =1.5%. Assume any suitable missing data	Understand	1
6	Design the concrete mix for the following data: characteristic compressive strength=20mpa, maximum size of aggregate =20mm (angular), degree of workability =0.9CF, degree of quality control =good and type of exposure=severe. Water absorption by CA =0.5% and moisture concrete FA=2.0%. Assume any suitable missing data.	Understand	2

UNIT –V
SPECIAL CONCRETES

PART-A (SHORT QUESTION)

1	Define Aerated Concrete	Remember	2
2	What is the general use of Shotcrete?	Remember	2
3	What is meant by No fine concrete?	Remember	1
4	What do you mean by Fibre Reinforced Concrete?	Remember	2
5	Define ferro-cement.	Remember	1
6	What is self-compacting concrete?	Remember	1
7	What are the uses of polymer concrete?	Remember	2
8	What are the advantages of using high-strength concrete?	Remember	1
9	What is polymer – modified concrete?	Understand	2
10	What is SIFCON?	Remember	1
11	Where do we use Fibre Reinforced Concrete?	Understand	3
12	What are materials of self-compacting concrete?	Remember	1
13	What are the types of polymer concrete?	Understand	3
14	What is the aggregate cement ratio of No-fine Concrete?	Remember	2
15	Factors effecting properties of Fibre Reinforced Concrete?	Understand	1
16	What are minerals of self-compacting concrete?	Remember	1
17	What is the water cement ratio of No-fine Concrete?	Understand	1
18	What is the Aspect ratio of the fiber?	Remember	1
19	What polymer – impregnated concrete?	Understand	1
20	What are the types of self-compacting concrete	Remember	2

PART-B (LONG QUESTION)

1	How can high-strength concrete be classified? Explain.	Understand	2
2	List the differences between polymer – impregnated concrete, polymer – modified concrete, and polymer concrete.	Understand	2
3	What are the various quality control tests done to ensure good performance of polymer concrete?	Understand	1
4	What are the basic properties of fibre – reinforced concrete which can be advantageously made use of in the design of structural elements?	Understand	1
5	In what way the behavior of FRC can be used for seismic – resistant design?	Understand	3
6	Explain in detail the method of design of light weight concreting.	Understand	2
7	Describe the procedure of Shotcrete& Grouting.	Understand	1
8	Explain the properties of polymer Impregnated Concrete.	Understand	1
9	Explain the design aspects of aerated concrete.	Understand	1
10	Explain the various methods of polymer concrete.	Understand	2
11	Distinguish between light weight concrete and high density concrete.	Understand	1
12	What are the different types of fibres used in FRC and how do they affect the properties of concrete?	Understand	5
13	Distinguish between high performance concrete and self	Understand	4

	compacting concrete.		
14	Distinguish between self consolidating concrete and conventional concrete.	Understand	4
15	Explain briefly about the types of fiber reinforced concert?	Understand	3
16	Write a brief note on self compacting concrete?	Understand	2
17	What are the different types of polymer concrete?	Understand	1
18	Write brief note on polymer concrete?	Understand	1
19	Explain about polymer – modified concrete?	Understand	1
20	Explain about polymer – impregnated concrete?	Understand	1

PART -C (ANALYTICAL QUESTION)

1	Distinguish between light weight concrete and high density concrete.	Understand	1
2	What are the different types fibres used in FRC and how do they affect the properties of concrete?	Understand	1
3	Distinguish between high performance concrete and self compacting concrete.	Understand	2
4	Distinguish between self consolidating concrete and conventional concrete.	Understand	2
5	Describe the procedure of Shotcrete& Grouting.	Understand	3
6	Explain the properties of polymer Impregnated Concrete.	Understand	1
7	Explain the design aspects of aerated concrete.	Understand	4
8	Explain the various methods of polymer concrete.	Understand	1
9	Explain the properties of self consolidating concrete	Understand	2
10	Explain the properties of self compacting concrete	Understand	2

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