



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER

B.Tech V Semester End Examinations (Regular), November- 2019

Regulations: R16

CONCRETE TECHNOLOGY

(Civil Engineering)

Time: 3 hours**Max. Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT- I

1.
 - a) 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? [7M]
 - b) 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? [7M]
2.
 - a) Explain in detail about the classification of aggregates. [7M]
 - b) 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? [7M]

UNIT – II

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|----|----|---|------|
| 3. | a) | What is curing? Explain in detail about the different methods of curing? | [7M] |
| | b) | Explain the process of measuring workability by Compacting factor? | [7M] |
| 4. | a) | How does the relation between the modulus of elasticity of concrete and strength vary with age? | [7M] |
| | b) | What is bleeding? Write the significance of bleeding in construction which proceeds in several lifts? | [7M] |

UNIT – III

5. a) How does gel space ratio affect the properties of hardened concrete? [7M]
b) 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? [7M]
6. a) Explain the various Non-destructive tests involved in monitoring the hardened concrete. [7M]
b) Why is the compressive strength of hardened concrete determined after 28 days? [7M]

UNIT– IV

7. a) Explain in detail about the statistical quality control and acceptance criteria of concrete. [7M]
b) 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. [7M]
8. a) Explain the quality control and durability of concrete in detail. [7M]
b) 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. [7M]

UNIT – V

9. a) What are the properties of fibre – reinforced concrete used in the design of structural elements? [7M]
b) What are the different types fibres used in Fibre Reinforced Concrete and how do they affect the properties of concrete? [7M]
10. a) Explain the various methods of polymer concrete. [7M]
b) Distinguish between self-consolidating concrete and conventional concrete. [7M]



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COURSE OBJECTIVES:

The course should enable the students to:

I	Discuss the physical and chemical properties of cement and admixtures.
II	Understand the workability of concrete, manufacturing processes of concrete and the behaviour of the hardened concrete.
III	Identify, formulate and solve problems in concrete mix design.
IV	Enrich the practical knowledge on mix design principles, concepts and methods

COURSE OUTCOMES (COs):

CO 1	Understand the basic physical and chemical properties of cement, admixtures and aggregates
CO 2	Describe the properties and factors influencing the workability of fresh concrete
CO 3	Determine the affect of water/cement ratio on the strength of hardened concrete and also the strength of concrete by using NDT testing methods
CO 4	Analyse the mix design of concrete
CO 5	Understand the basic concepts and applications of special concretes at various situations

COURSE LEARNING OUTCOMES (CLOs):

ACE010.01	Explain the different types of cement, grades of cement and hydration process.
ACE010.02	Classify different types of admixture and their usage.
ACE010.03	Understand aggregates and classification of aggregate depending upon shape, size, texture etc.
ACE010.04	Understand the Alkali Aggregate Reaction.
ACE010.05	Understand Sieve Analysis and grading of aggregate.
ACE010.06	Understand the concept of workability of concrete and factors affecting workability.
ACE010.07	Explain the measurement of workability by different test.
ACE010.08	Understand the concept of segregation and bleeding in concrete.
ACE010.09	Explain the various steps involved in the manufacturing process of concrete.
ACE010.10	Understand the importance of quality of mixing water.
ACE010.11	Understand hardened concrete and its properties.
ACE010.12	Explain the importance of water cement ratio, maturity concept in hardened concrete
ACE010.13	Understand the various methods of curing of concrete.
ACE010.14	Explain the different tests involved in testing of hardened concrete.
ACE010.15	Understand the concept of creep and how it effects hardened concrete.
ACE010.16	Explain shrinkage and its effect on concrete.
ACE010.17	Understand the importance of Mix proportions.

ACE010.18	Understand durability and quality control of concrete.
ACE010.19	Explain Acceptance criteria involved in concrete mix proportioning.
ACE010.20	Explain proportioning of concrete method by different methods.
ACE010.21	Design the concrete mix by BIS method.
ACE010.22	Explain the different types of special concrete.
ACE010.23	Explain the effect of fibre in the concrete.
ACE010.24	Explain applications of special concrete in various situations.

MAPPING OF SEMESTER END EXAMINATION - COURSE OUTCOMES

SEE Question No		Course Learning Outcomes	Course Outcomes	Blooms Taxonomy Level
1	a	ACE010.01 Explain the different types of cement, grades of cement and hydration process.	CO 1	Understand
	b	ACE010.02 Classify different types of admixture and their usage.	CO 1	Remember
2	a	ACE010.03 Understand aggregates and classification of aggregate depending upon shape, size, texture etc.	CO 1	Understand
	b	ACE010.04 Understand the Alkali Aggregate Reaction.	CO 1	Understand
3	a	ACE010.07 Explain the measurement of workability by different test.	CO 2	Remember
	b	ACE010.08 Understand the concept of segregation and bleeding in concrete.	CO 2	Understand
4	a	ACE010.09 Explain the various steps involved in the manufacturing process of concrete.	CO 2	Remember
	b	ACE010.10 Understand the importance of quality of mixing water.	CO 2	Understand
5	a	ACE010.11 Understand hardened concrete and its properties.	CO 3	Understand
	b	ACE010.12 Explain the importance of water cement ratio, maturity concept in hardened concrete	CO 3	Understand
6	a	ACE010.13 Understand the various methods of curing of concrete.	CO 3	Understand
	b	ACE010.14 Explain the different tests involved in testing of hardened concrete.	CO 3	Understand
7	a	ACE010.17 Understand the importance of Mix proportions.	CO 4	Understand
	b	ACE010.18 Understand durability and quality control of concrete.	CO 4	Understand
8	a	ACE010.18 Understand durability and quality control of concrete.	CO 4	Understand
	b	ACE010.19 Explain Acceptance criteria involved in concrete mix proportioning.	CO 4	Understand
9	a	ACE010.21 Explain the different types of special concrete.	CO 5	Understand
	b	ACE010.24 Explain applications of special concrete in various situations.	CO 5	Remember
10	a	ACE010.23 Explain the effect of fibre in the concrete.	CO 5	Remember
	b	ACE010.24 Explain applications of special concrete in various situations.	CO 5	Understand

Signature of Course Coordinator

HOD, CE