Hall Ticket No | | | | | | | | | | | Question Paper Code: ACEB08

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER-II

B.Tech IV Semester End Examinations, April- 2019

Regulations: R18

MATERIALS, TESTING AND EVALUATION

(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

MODULE– I

1. a) Write about the properties and important uses of following materials **[7M]**
   i. Cast iron
   ii. Wrought iron
   iii. Steel

   b) Classify different types of varnish and briefly describe them. **[7M]**

2. a) Explain the various types of cement. Mention their applications. **[7M]**

   b) What are the initial and final setting times of cement? What is their importance? **[7M]**

MODULE – II

3. a) With the help of stress-strain diagram, explain strain hardening. **[7M]**

   b) What are the three modes of loading in fracture mechanics? Explain with neat sketch. **[7M]**

4. a) What is meant by workability of concrete? Mention different tests conducted on workability of concrete. **[7M]**

   b) Explain fooling terms. **[7M]**
   a. Brittle fracture.
   b. Ductile fracture.

MODULE – III

5.	a)	What do you mean by non-ferrous metal? Explain manufacturing process of aluminium.	**[7M]**
	b)	Describe briefly the fracture toughness of different materials.	**[7M]**
6.	a)	Explain about the test conducted to determine the bulk density of fine aggregate.	**[7M]**
	b)	Discuss about the following i. Silt content test ii. Fineness modulus	**[7M]**

MODULE – IV

7.	a)	What is brick masonry? State and explain briefly the various classifications of brick masonry?	**[7M]**
	b)	Explain the process of manufacturing of Glass? What are the Uses of glass inconstruction industry?	**[7M]**
8.	a)	Define seasoning of timber. What are the objects of seasoning of timber?	**[7M]**
	b)	Explain in detail about Classifications of bonds in bricks with neat sketches?	**[7M]**

MODULE – V

9.	a)	Elaborate the Half turn stairs and Continuous stairs with neat sketches.	**[7M]**
	b)	Distinguish between quarter turn stairs and bifurcated stair?	**[7M]**
10.	a)	Classify the different types of buildings according to NBC?	**[7M]**
	b)	What are the factors to be considered while selecting site for any building construction?	**[7M]**

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COURSE OBJECTIVES:

The course should enable the students to:

I	Make measurements of behaviour of various materials used in Civil Engineering.
II	Provide physical observations to complement concepts learnt.
III	Introduce experimental procedures and common measurement instruments, equipment, devices.
IV	Disclose the variety of established material testing procedures and techniques.

COURSE OUTCOMES (COs):

CO 1	Identify the different engineering materials, properties, manufacturing process of materials.
CO 2	Describe the mechanical behaviour and characteristics, elastic and plastic deformation of metals, strength properties and background of fracture mechanics.
CO 3	Conduct mechanical testing of various metals like iron, steel and various non-ferrous metals, impact testing, background of fracture toughness of different materials, creep, fatigue.
CO 4	Understand the standard testing procedure of bricks, sand, concrete, soils, bitumen and bitumen mixes.
CO 5	Describe the properties, mechanical behaviour of polymers, metals, composites, cementitious materials and special materials.

COURSE LEARNING OUTCOMES (CLOs):

ACEB08.01	Identify the properties of engineering materials like cement, sand, concrete, ceramics, bitumen, structural steel etc.
ACEB08.02	Explain the classification of engineering materials and uses of materials.
ACEB08.03	Understand the manufacturing process of cement, concrete, bitumen, glass, plastics, metals, paints and other engineering materials.
ACEB08.04	Classify the steel, glass, varnishes, adhesives, carbon composites.
ACEB08.05	Explain the mechanical behaviour and characteristics of different metals.
ACEB08.06	Understand the importance of elasticity principle, characteristics and plastic deformation of metals.
ACEB08.07	Explain standards for different materials, stress-strain interpretation.
ACEB08.08	Describe the fundamentals of internal friction, creep, brittle fracture of steel.
ACEB08.09	Understand the concept of fatigue of materials, structural integrity assessment procedure.
ACEB08.10	Perform the mechanical testing of various metals like iron, steel and non-ferrous metals.
ACEB08.11	Explain elastic deformation and plastic deformation of metals.
ACEB08.12	Understand the impact testing, fatigue and creep of materials.
ACEB08.13	Explain fracture toughness of different materials like steel and non-ferrous metals.
ACEB08.14	Explain the testing procedures of bricks and sand.

ACEB08.15	Describe the testing procedures of fresh and hardened concrete.
ACEB08.16	Understand the properties of soil by conducting the different tests.
ACEB08.17	Explicate the procedures of testing bitumen and bitumen mixes.
ACEB08.18	Understand the testing procedures of polymers and polymer based materials.
ACEB08.19	Explain the behaviour of metals under various loads.
ACEB08.20	Describe the mechanical behaviour of composite materials.
ACEB08.21	Discuss the properties of cementitious materials like fly ash, blast furnace slag.

MAPPING OF SEMESTER END EXAMINATION - COURSE OUTCOMES

SEE Question No		Course Learning Outcomes		Course Outcomes	Blooms Taxonomy Level
1	a	ACEB08.01	Classify the steel, glass, varnishes, adhesives, carbon composites.	CO 1	Remember
	b	ACEB08.02	Explain the classification of engineering materials and uses of materials.	CO 1	Remember
2	a	ACEB08.02	Explain the classification of engineering materials and uses of materials.	CO 1	Remember
	b	ACEB08.01	Identify the properties of engineering materials like cement, sand, concrete, ceramics, bitumen, Steel.	CO 1	Understand
3	a	ACEB08.05	Explain the mechanical behaviour and characteristics of different metals.	CO 2	Remember
	b	ACEB08.05	Explain standards for different materials, stress-strain interpretation.	CO 2	Understand
4	a	ACEB08.06	Explain the mechanical behaviour and characteristics of different metals.	CO 2	Understand
	b	ACEB08.05	Understand the importance of elasticity principle, characteristics and plastic deformation of metals.	CO 2	Understand
5	a	ACEB08.07	Understand the importance of elasticity principle, characteristics and plastic deformation of metals.	CO 3	Remember
	b	ACEB08.08	Understand the concept of fatigue of materials, structural integrity assessment procedure.	CO 3	Remember
6	a	ACEB08.10	Explain standards for different materials, stress-strain interpretation.	CO 3	Understand
	b	ACEB08.11	Understand the concept of fatigue of materials, structural integrity assessment procedure.	CO 3	Understand
7	a	ACEB08.15	Describe the testing procedures of fresh and hardened concrete.	CO 4	Remember
	b	ACEB08.13	Explain fracture toughness of different materials like steel and non-ferrous metals.	CO 4	Remember
8	a	ACEB08.12	Understand the impact testing, fatigue and creep of materials.	CO 4	Understand
	b	ACEB08.15	Explain fracture toughness of different materials like steel and non-ferrous metals.	CO 4	Remember
9	a	ACEB08.16	Understand the properties of soil by conducting the different tests.	CO 5	Remember
	b	ACEB08.16	Explicate the procedures of testing bitumen and bitumen mixes.	CO 5	Remember
10	a	ACEB08.17	Describe the mechanical behaviour of composite materials.	CO 5	Understand
	b	ACEB08.17	Discuss the properties of cementitious materials like fly ash, blast furnace slag.	CO 5	Understand

Signature of Course Coordinator **HOD, CE**