



Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
B.Tech Degree S4 (Hons.) Examinations April 2026 (2024 Admn)

**Course Code: HNCET409**

**Course Name: MODERN CONSTRUCTION MATERIALS**

Max. Marks: 60

Duration: 2 hours 30 minutes

**PART A**

*(Answer all questions. Each question carries 3 marks)*

		CO	Marks
1	Differentiate crystalline and amorphous solids.	CO1	(3)
2	What are the thermal properties of materials?	CO1	(3)
3	Define Self-Compacting Concrete and discuss the properties that distinguish it from conventional concrete.	CO2	(3)
4	Define alloy steels. Briefly discuss the role of alloying elements in improving the properties of steel.	CO2	(3)
5	What are cellular cores? Explain their purpose and importance in sandwich panel construction.	CO3	(3)
6	Give examples of recycled materials used in construction.	CO3	(3)
7	Define smart materials with examples.	CO4	(3)
8	List the common nanomaterials used in construction	CO4	(3)

**PART B**

*(Answer any one full question from each module, each question carries 9 marks)*

**Module -1**

9	a) Explain the different types of atomic bonding and their engineering significance.	CO1	(9)
10	a) Explain stress-strain behaviour of engineering materials.	CO1	(5)

- b) Discuss rheological behaviour of construction materials. CO1 (4)

**Module -2**

- 11 a) Discuss High Strength Concrete and its applications. CO2 (5)  
 b) Describe Fibre Reinforced Concrete, its properties and applications. CO2 (4)
- 12 a) Explain various metallic and non-metallic coating systems with their mechanisms. CO2 (5)  
 b) Discuss Geopolymer Concrete as an alternative to conventional concrete. CO2 (4)

**Module -3**

- 13 a) What are composite materials? Explain their basic constituents and mention their advantages over conventional materials. CO3 (5)  
 b) Explain FRP strengthening of structures. CO3 (4)
- 14 a) What are geosynthetic polymers? Discuss their major functions in geotechnical and civil engineering applications. CO3 (5)  
 b) Explain structural elastomeric bearings and their functions. CO3 (4)

**Module -4**

- 15 a) A bridge requires continuous monitoring for crack formation. Suggest appropriate smart material systems, justify your choice, and describe their working principle. CO4 (5)  
 b) Describe a case study where intelligent materials were used for sustainable building construction. CO4 (4)
- 16 a) Explain Nano Concrete and its advantages. CO4 (5)  
 b) Discuss carbon nanotubes and their role in smart concrete. CO4 (4)

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