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**Question Paper Code:92P03**

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

Second Semester

19UPH203–MATERIALPHYSICS

(Common to Mechanical & Chemical Engineering)

(Regulation 2019)

Duration: Three hours

Maximum: 100 Marks

PART A (Answer Any Ten)

10\*2 = 20 Marks

1. Name the four strengthening mechanisms of metals. CO1 – U
2. Define work hardening of metals. CO5 – U
3. Explain the term Universal Testing Machine. CO6 – U
4. What is hardness? CO6 – U
5. What is the purpose of tensile test? CO5 – U
6. Define coefficient of thermal conductivity and mention its unit. CO2 – U
7. What is thermal resistance? CO2 – U
8. Explain the concept of heat exchangers? CO2 – U
9. What are the uses of Newton's law of cooling? CO2 – U
10. What are the types of metallic glasses? CO3 – U
11. Define the term shape memory alloys? CO3 – U
12. What is pseudo elasticity? CO3 – U
13. Give the structural classification of ceramics. CO1 – U
14. What are the types of carbon nanotube structure? CO6 – U
15. Compare Top Down process and Bottom-Up process. CO2 – U

PART B (5\*16=80 Marks)

16. (a) Explain tensile test. What are the factors measured from this test. CO5-U (16)
- Or
- (b) Outline some Functions and types of shading devices. CO2- U (16)
- 17 (a) How hardness of a material is measured using brinell hardness test. CO1-App (16)  
Give its advantages and limitations.
- Or
- (b) A slab of material length 1m, area of cross section is  $5\text{m}^2$ . One end of the slab is at  $100^{\circ}\text{C}$  and other end at  $50^{\circ}\text{C}$ . Calculate the thermal conductivity of the slab. CO5-App (16)
- 18 (a) Describe Searle's method to determine thermal conductivity of metals with relevant theory. CO2- Ana (16)
- Or
- (b) Discuss the factors, reverberation, resonance, echelon effect, focusing and reflection that affect the acoustics in hall and the remedies for them. CO2- U (16)
- 19 (a) Explain the preparation, types, properties and application of metallic glasses CO3- U (16)
- Or
- (b) Explain thermal, mechanical, electrical and chemical properties of ceramic materials CO2- U (16)
- 20 (a) Explain the carbon nano tubes with properties and Applications. CO4- U (16)
- Or
- (b) Discuss with suitable examples of the applications of nano particles in various technical fields. CO4- App (16)