



B.E/B.TECH DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Second Semester

COMMON TO AUTO / CIVIL / ECE / IT / ISE / MECH / MCE

U18PHI2201: Engineering Physics

COURSE OUTCOMES

- CO1:** Understand the principles of motion and rotation of a rigid body in the plane.
CO2: Enhance the fundamental knowledge in properties of matter and its applications relevant to various streams of engineering and technology.
CO3: To introduce the phenomenon of heat and account for the consequence of heat transfer in engineering systems.
CO4: To apply the concepts of electrostatics and dielectrics for various engineering Applications.
CO5: To understand the basics of magnetostatics.
CO6: To introduce and provide a broad view of the smart materials and Nano science to undergraduates.

Time: Three Hours

Maximum Marks: 100

**Answer all the Questions:-
 PART A (10 x 2 = 20 Marks)
 (Answer not more than 40 words)**

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|---|-----|-------------------|
| 1. Define rigidity modulus. | CO2 | [K ₁] |
| 2. Infer the importance of bimetallic strips in water heater. | CO3 | [K ₂] |
| 3. Define specific heat capacity. | CO3 | [K ₁] |
| 4. Draw stress-strain diagram and infer the term ultimate strength. | CO2 | [K ₁] |
| 5. What is dielectric loss? | CO4 | [K ₁] |
| 6. Interpret nature of lorentz force. | CO5 | [K ₂] |
| 7. Recall the behaviour of SMA. | CO6 | [K ₂] |
| 8. Mention the properties of nano materials? | CO6 | [K ₂] |
| 9. Define angular momentum. | CO1 | [K ₁] |
| 10. What is translational motion? | CO1 | [K ₁] |

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

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|-----|----|--|----|-----|-------------------|
| 11. | a) | Define bending moment? Derive an expression for the Internal bending moment of a beam. | 12 | CO2 | [K ₂] |
| | b) | Calculate the Poisson's ratio for the material, given $Y=12.25 \times 10^{10} \text{ N/m}^2$ and $n=4.55 \times 10^{10} \text{ N/m}^2$ | 4 | CO2 | [K ₂] |
| 12. | a) | Define co-efficient of thermal conductivity. Illustrate the one-dimensional flow of heat along a bar of uniform area of cross section and solve it for steady state condition. | 13 | CO3 | [K ₂] |
| | b) | Examine coefficient of linear thermal expansion in solids. | 3 | CO3 | [K ₂] |
| 13. | a) | State and explain the principle and working to prepare nano materials using Ball milling method. | 6 | CO6 | [K ₁] |
| | b) | Discuss the preparation method, properties and applications of metallic glasses with neat diagram. | 10 | CO6 | [K ₁] |
| 14. | a) | Compute the electronic polarization and ionic polarization in dielectric material. | 13 | CO4 | [K ₂] |
| | b) | Evaluate the temperature dependence of polarization. | 3 | CO5 | [K ₂] |
| 15. | | What is rigid body? Derive the Euler's equation of motion for a rigid body. | 16 | CO1 | [K ₂] |
| 16. | a) | Describe the synthesis method of carbon nano tubes using Chemical Vapor Deposition. | 10 | CO6 | [K ₂] |
| | b) | Derive the Maxwell's equation for magnetostatic condition | 6 | CO5 | [K ₂] |
