



R17 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

Subject Code: 1B2AF

B.Tech I Year II Semester Supplementary Examinations, January 2024

ENGINEERING PHYSICS-II

(Common to EEE,ECE,CSE & IT)

Maximum Marks: 70

Date: 19.01.2024 Duration: 3hours

- Note:**
- 1.This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a,b,c,d as sub questions.

Part-A

All the following questions carry equal marks

10x2M=20 Marks

1. Explain the significance of a wave function.
2. Calculate energy of an electron which is associated with an wave of wavelength, $\lambda = 3 \times 10^{-10}$ m given $h = 6.625 \times 10^{-34}$ J-s.
3. What is direct and indirect band gap semiconductors.
4. What is meant by rectification process?
5. Define the dielectric constant.
6. Explain about pyro electricity.
7. Define the magnetic permeability and magnetic susceptibility.
8. What are type-I and type-II superconductors
9. What is quantum confinement effect?
10. Describe any two processes by which nanomaterials are fabricated.

Part-B

Answer all the questions

5X10M=50Marks

11. Explain de-Broglie hypothesis. Explain Davisson & Germer's experiment in support of this hypothesis 10M

(OR)

12. (a) Explain the origin of energy bands formation in solids. 5M

- (b) Explain the Kronig-Penny model qualitatively. 5M

13. Explain the formation of PN Junction and the energy level diagram of biased PN junction. 10M

(OR)

14. a) Determine the concentration of holes in the valance band of intrinsic semiconductors. 5M
b) Explain the working of a Solar cell. 5M

15. a) Derive an expression for ionic polarizability. 5M
b) Derive an expression for Internal fields in dielectric material. 5M

(OR)

16. a) Explain the various types of polarization mechanisms. 5M
b) Derive an expression for the Clausius-Mossotti equation. 5M

17. a) Explain the origin of Magnetic moment and Bohr magneton. 5M
b) What is Meissner Effect? Give few applications of superconductivity. 5M

(OR)

18. a) What is magnetic hysteresis explain on the basis of domain theory. 5M
b) Explain superconductivity and give few properties of superconducting material. 5M
5M

19. a) Explain the importance of surface to volume ratio on nano scale. 5M
b) What are nanomaterials. How are they classified? 5M

(OR)

20. a) Explain how nano particles play an important role over bulk materials. 5M
b) Write in detail the SEM characterization technique in detail. 5M