R17 Regulation *Subject Code: 1B2AF*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Year II Semester Supplementary Examinations, September 2023

ENGINEERING PHYSICS-II

(Common to EEE, ECE, CSE & IT)

Maximum Marks: 70 Date:14.09.2023 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. Define Heisenberg uncertainty principle.
2. Calculate the wavelength associated with 1 MeV electron.
3. Define the rectification and mention its types.
4. What are direct and indirect band gap semiconductors?
5. Define the electric dipole, dielectric susceptibility.
6. Define Pyro-electric effect.
7. What is meant by Bohr magneton and write its importance.
8. Explain the Messier effect.
9. Explain the quantum confinement effect.
10. What is surface to volume ratio for the nano materials.

Part-B

All the following questions carry equal marks 5X10M=50Marks

11. Explain the origin of energy band structures and discuss the classification of materials based on it. (10m)

(OR)

12. Explain in detail about the Kronig- Penny model. (10m)

13. Explain about Solar cell working and I-V characteristics with its applications. (10m)

(OR)

14. Draw the energy band diagram of a open circuited PN-junction and discuss its formation. (10m)

15. Derive an expression for ionic polarizability of a molecule. (10m)

(OR)

16. a) Derive an expression for electronic polarizability of an atom. (5m)
b) Write the importance of the Classius-Mossitti equation and derive it. (5m)

17. Define the Messiner Effect and show that all superconductors are perfectly dia magnetic materials. (10m)

(OR)

18. a) What is magnetic hysteresis explain on the basis of domain theory. (5m)
b) Explain the Type-I & Type-II superconductors with examples. (5m)

19. Explain the nano particles synthesis by using Sol-Gel and ball milling. (10m)

(OR)

20. a) Explain the top-down and bottom-up fabrications. (5m)
b) Write in detail about the XRD characterization technique with its advantages and disadvantages. (5m)