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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year II Semester Examinations, June - 2022
ENGINEERING PHYSICS – II
(Common to EEE, ECE, CSE, IT, ETM)

Time: 3 Hours   **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) Obtain the expression of the time-dependent Schrodinger wave equation for a given wave function.
  b) State Heisenberg's uncertainty principle. Explain the same with suitable examples.
                                                                                    [8+7]

2.a) Obtain an expression for carrier concentration of an N-type semiconductor.
  b) Draw the E-K curve by explaining important conclusions.   [8+7]

3.a) What is electronic polarization? Show that the electronic polarization depends on the volume of the constituent atom.
  b) Write short notes on Piezoelectricity and pyroelectricity.   [8+7]

4.a) Explain the hysteresis curve shown by ferromagnetic materials based on domain theory.
  b) What is superconductivity? Discuss the general properties of superconductors. [8+7]

5.a) Discuss the bottom-up and top-down approaches for preparing nanomaterials.
  b) With the help of a block diagram, explain the essential components and working principle of a Transmission Electron Microscope (TEM).   [8+7]

6.a) Explain the Konig-Penny model of solids and show that it leads to the energy band structure of solids.
  b) Write a short note on i) Meissner effect ii) BaTiO3 structure.   [8+7]

7.a) What is meant by local field in a dielectric and how is it calculated for a cubic structure?
  b) Distinguish between hard and soft magnetic materials.   [8+7]

8.a) Discuss the V-I characteristics of PN junction diode when it is forward and reverse biased.
  b) Explain the fundamentals of sol-gel method of nanostructure synthesis.   [8+7]

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