

I B. Tech II Semester Supplementary Examinations, December - 2020
ENGINEERING PHYSICS-II
(Com. to All Branches)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a) Apply Schrödinger equation for motion of a particle in 1- Dimensional rigid box and show that the energy is quantized. (10M)  
b) Write a note on Classical Bits and Qu-bits. (5M)
2. a) Describe the dependence of resistivity of a metal on impurity and temperature. (10M)  
b) Explain the drawbacks of classical free electron theory. (5M)
3. a) Describe the formation of energy bands in solids. Classify solids into conductors, insulators, and semiconductors with suitable energy band diagrams. (10M)  
b) Explain how energy bands are formed? (5M)
4. a) Briefly explain different types of magnetic materials and their properties. (10M)  
b) Describe the domain theory of ferromagnetism. (5M)
5. a) What are Cooper pairs? Give an outline of BCS theory of superconductivity. (10M)  
b) Distinguish between type-I and type-II superconductors. (5M)
6. a) Define electric polarization and polarizability. Deduce an expression for electronic polarizability in terms of the radius of an atom. (10M)  
b) How intrinsic breakdown occurs in dielectric material? Explain. (5M)
7. a) Describe different types of semiconductors. Derive the expression for the intrinsic carrier concentration. (10M)  
b) Describe in detail the Einstein's relation between diffusivity and mobility. (5M)
8. a) What are the carbon nanotubes? Discuss any one of methods to synthesize nanotubes. (10M)  
b) Write a short note on Quantum dots and Quantum wells. (5M)