Code No: R10203 **R10** **SET-1**

I B. Tech II Semester Supplementary Examinations, April/May - 2018
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) Arrive at the time-independent form of Schrödinger's equation for free electrons in a metal. Write a note on the physical significance of the wave function. (10M)
   b) Discuss advantages of quantum computing over classical computation. (5M)

2. a) Discuss the assumptions under quantum free electron theory. Obtain the expression for electrical conductivity on the basis of quantum free electron theory. (10M)
   b) Outline the important drawbacks of the classical free electron. (5M)

3. a) Classify solids into three categories on the basis of band theory of solids. (10M)
   b) What is an energy band? Explain how they are formed in solids. (5M)

4. a) Briefly explain different types of magnetic materials and their properties. (10M)
   b) Differentiate a soft magnetic material from a hard magnetic material. (5M)

5. a) Explain any five properties of superconductors. (10M)
   b) Discuss applications of superconductors. (5M)

6. a) Derive an expression for electronic polarizability in dielectric material. (10M)
   b) Elucidate the various types of dielectric breakdown in dielectric material. (5M)

7. a) Derive an expression for concentration of holes in intrinsic semiconductors. (10M)
   b) Discuss the effect of donor and acceptor impurities in semiconductors. (5M)

8. Describe the mechanical, chemical and magnetic properties of nanoparticles. (15M)
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