

Code No: R13203

R13**SET-1****I B. Tech II Semester Supplementary Examinations, Nov - 2017****ENGINEERING PHYSICS**

(Com. to CE,ME,CSE,PCE,IT,Chem E,Aero E,Auto E,Min E,Pet E,Metal E & Textile Engg)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answering the question in **Part-A** is Compulsory3. Answer any **THREE** Questions from **Part-B**

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**PART -A**

1. a) Define quarter and half wave plates. (4M)
- b) State and explain Bragg's law. (3M)
- c) Describe the effects of current on a superconductor. (3M)
- d) Explain reverberation and reverberation time. (4M)
- e) What is Fermi energy? Explain. (4M)
- f) State the principle of working of a solar cell. (4M)

**PART -B**

2. a) Describe Fraunhofer diffraction due to a double slit and deduce the position of maxima and minima. (10M)
- b) Explain how Newton's rings are formed. (6M)
3. a) What is space lattice? Find the packing fraction for BCC and FCC crystals. (10M)
- b) State and explain spontaneous emission and stimulated emission processes in lasers. (6M)
4. a) Distinguish between ferro, anti-ferro and ferri magnetic materials in terms of susceptibility and its dependence on temperature. (10M)
- b) Discuss the Meissner effect in detail and prove that superconductors are perfectly diamagnetic in nature. (6M)
5. a) State and prove Stoke's theorem. (10M)
- b) What is meant by reverberation? Discuss Sabine's formula. (6M)
6. a) Describe the formation of energy bands in solids. Explain with proper diagram classify solids into conductors, insulators, and semiconductors. (10M)
- b) Explain failures of the classical free electron theory. (6M)
7. a) What is an intrinsic semiconductor? Derive expressions for the electron and hole concentration in an intrinsic semiconductor. (10M)
- b) The Hall coefficient of a semiconductor is  $3.22 \times 10^{-4} \text{ m}^3 \text{ C}^{-1}$ . Its resistivity is  $8.50 \times 10^{-3} \Omega\text{-m}$ . Calculate the mobility and carrier concentration of the carriers. (6M)

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