

Code No: R13103

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

(Com. to ECE,EEE,EIE,Bio-Tech, E Com E, Agri E)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **THREE** Questions from **Part-B**

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**PART -A**

1. a) What is Rayleigh's criterion for resolution? (3M)
- b) Explain the terms i) Basis and ii) Unit cell. (4M)
- c) Differentiate between type-I and type-II superconductors. (3M)
- d) State Gauss divergence theorem. (4M)
- e) Define relaxation time and mobility of charge carriers. (4M)
- f) Describe drift and diffusion currents. (4M)

**PART -B**

2. a) Discuss Fraunhofer's diffraction at a double slit with neat diagram. What is the effect of increasing the i) slit width ii) slit separation? (10M)
- b) Explain the circularity of Newton's rings. (6M)
3. a) What are miller indices? Draw the following planes in a cubic unit cell: (110), (311) and (011). (10M)
- b) Explain lasing action in a He-Ne laser with neat energy level diagram. (6M)
4. a) Explain electronic polarization and show that electronic polarizability is directly proportional to the volume of the atom. (10M)
- b) Briefly outline BCS theory of superconductivity. (6M)
5. a) Discuss the factors affecting the architectural acoustics of a building and explain their remedy. (10M)
- b) Express Maxwell's equations in integral form. (6M)
6. a) Obtain the energy values and normalized wave functions for a particle in a one dimensional infinite potential box of width ' $a$ '. (10M)
- b) Explain the formation of energy bands in solids and classify solids on the basis of energy band gap. (6M)
7. a) Derive an expression for Fermi level in a p-type semiconductor and hence obtain an expression for concentration of holes in the p-type semiconductor. (10M)
- b) Explain the electronic transport mechanism of an LED. (6M)