Code No: R13103 **R13** SET - 1

I B. Tech I Semester Supplementary Examinations, May - 2018
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) State and explain Rayleigh's criterion for resolution. (4M)
b) Discuss characteristics of lasers. (3M)
c) What is orientation polarization? Explain. (3M)
d) State and explain Eyring's formula. (4M)
e) Explain the physical significance of wave function (ψ). (4M)
f) What is Fermi level? Describe its physical significance. (4M)

PART –B

2. a) Derive an expression for the diameter of the n^{th} dark ring in Newton's rings viewed under reflected system. (8M)
b) In Newton's ring experiment the diameter of the 15^{th} dark ring was found to be 0.590cm and that of the 5^{th} dark ring 0.336cm. If the radius of the plano convex lens is 100cm, calculate the wavelength of the light used. (4M)
c) What is an LED? Explain the working of LED with a neat diagram. (4M)

3. a) What are miller indices? Draw the following planes in a cubic unit cell: (110), (311), and (011). (8M)
b) What is a primitive cell and how does it differ from unit cell? (4M)
c) What are matter waves and list out their properties? (4M)

4. a) Draw and explain B-H curve for a ferromagnetic material and identify the retentivity, and the coercive field on the curve. What is the energy loss per cycle? (8M)
b) A paramagnetic material of relative permeability 1.0036 is placed in a magnetic field of intensity 10^4 A/m. Calculate the intensity of magnetization. (4M)
c) Explain in detail the acoustic demands of a hall. (4M)

5. a) By using Gauss divergence and Stokes theorems convert Maxwell's equations from differential form to integral form. (8M)
b) State Gauss divergence and Stokes theorems. (4M)
c) Obtain Clausius Mosotti relation in dielectrics. (4M)
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6. a) Discuss the formation of energy bands in solids and explain how solids are classified on the basis of energy band gap. (8M)

   b) What is a Fermi energy level? Explain Fermi energy function. (4M)

   c) Define numerical aperture and express it in terms of fractional refractive index change. (4M)

7. a) Derive and expression for the density of holes in the valence band of an intrinsic semiconductors. (8M)

   b) Explain Einstein's relation for mobility and diffusion coefficient of charge carriers. (4M)

   c) Explain the phenomenon of double refraction. (4M)