Code No: R161104 **R16** SET - 1

I B. Tech I Semester Supplementary Examinations, May - 2018
APPLIED PHYSICS
(Com. to ECE,CSE,IT,EIE,ECom E)

Time: 3 hours Max. Marks: 70

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

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PART –A

1.	a)	Why two independent sources of light of the same wavelength cannot produce interference fringes?	(2M)
	b)	Why central fringe in diffraction pattern is always bright with maximum intensity?	(2M)
	c)	What is lasing action?	(2M)
	d)	Discuss the physical significance of curl of a vector.	(2M)
	e)	When do you say that wave function is said to be normalized?	(2M)
	f)	Define plane of vibration and plane of polarization.	(2M)
	g)	What is a hole in the valence band?	(2M)

PART -B

2.	a)	With a neat ray diagram describe construction and working of Michelson's interferometer.	(10M)
	b)	Explain how you determine the refractive index of a material using Michelson's interferometer.	(4M)
3.	a)	Explain Rayleigh's criterion for resolving power.	(5M)
	b)	Derive an expression for resolving power of a telescope.	(5M)
	c)	Calculate the linear separation between two points at a distance of 10 km from a telescope objective of width 0.5 m if the wavelength of light used is 600 nm.	(4M)
4.	a)	Discuss various methods to produce plane polarized light.	(10M)
	b)	Calculate the thickness of a quarter wave plate for monochromatic light of wavelength 600nm if the refractive indices of ordinary and extraordinary rays in the medium are 1.5442 and 1.5533 respectively.	(4M)
5.	a)	State and prove Stoke's theorem.	(10M)
	b)	Show that curl of a vector field is a vector quantity.	(4M)
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6. a) Write down the Schrodinger's wave equation for a particle in a box. Solve it to obtain eigen function and show that eigen values are discrete. (10M)

   b) Find the lowest energy of an electron confined in one dimensional box of width 0.1nm. (4M)

7. a) Explain Hall effect and derive an expression for Hall coefficient in semiconductors. (10M)

   b) Discuss applications of Hall effect. (4M)