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

I B. Tech I Semester Supplementary Examinations, July/August - 2021

APPLIED PHYSICS

(Com. to ECE,CSE,IT,EIE,EComE)

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 Compulsory
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	What are the conditions to be satisfied to get sustained interference fringe pattern?	(2M)
	b)	What happens to the diffraction fringes, if the slit width is reduced in single slit experiment? Explain why?	(2M)
	c)	What is the quarter wave plate? Give the expression for its thickness.	(2M)
	d)	What is meant by Active medium in a Laser?	(2M)
	e)	What are the fundamental laws of electromagnetism?	(2M)
	f)	State and explain Fermi distribution function.	(2M)
	g)	Explain the effect of impurity on the Fermi level in p-type semiconductor.	(2M)

PART -B

2.	a)	State and explain the Superposition principle?	(4M)
	b)	With ray diagram discuss the theory of thin films and derive the condition for constructive and destructive interference in the case of reflected system.	(10M)
3.	a)	What are the types of diffraction and give the differences between them.	(4M)
	b)	Obtain the condition for primary maxima in Fraunhoffer diffraction due to a single slit.	(6M)
	c)	Find the angular width of the central maxima in the Fraunhoffer diffraction using a slit of width 1 μm when the slit is illuminated by light of wavelength 600 nm.	(4M)
4.	a)	How the polarized light is different from ordinary light? Write notes on Nicol prism.	(10M)
	b)	Find the minimum thickness of half and quarter wave plates for a light beam, λ=589.3nm if μ_e= 1.48640 and μ_o= 1.65833.	(4M)
5.	a)	Write the Maxwell's equation in integral and differential forms. Explain the physical significance of each equation.	(9M)
	b)	Explain gradient of a scalar field and divergence of a vector field with physical significance.	(5M)
6.	a)	What are matter waves? Mention their properties.	(5M)
	b)	What is de Broglie's hypothesis? Derive the de Broglie's wavelengths for various cases.	(9M)
7.	a)	What do you understand by drift and diffusion currents in the case of a semiconductor? Deduce Einstein's relation relating to these currents.	(9M)
	b)	Distinguish between n- and p-type semiconductors.	(5M)
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