BSM-131	Roll No.	

B. Tech. (3/4/5Credit Subjects)
Year: 2025-26 Semester: ODD
Minor Examination
Engineering Physics

Time: 2 Hrs. Max Marks: 20

Note: Attempt ALL questions.

			Marks	CO	BL	PO	PI Code
Q1.		Attempt three parts of the followings. Part (a) is compulsory. (Unit-I and Unit-II)					
	a)	Derive the conditions for the maximum and minimum intensities in Fraunhofer diffraction phenomenon from a single slit. Also find the ratio of intensities. Why are the higher orders in diffraction patterns are not visible? Explain.	4	1	4	1	
	b)	A soap film of refractive index 1.33 and thickness 4500 Å is exposed to white light. Which wave-lengths in the visible region are reflected?	2	1	3	1	
	c)	Explain the physical significance of wave function with the help of appropriate example.	2	2	2	2	
	d)	Write down momentum and energy operators and explain their physical significance.	2	2	2	1	
Q2.		Attempt two parts of the following. Part (a) is compulsory. (Unit-I)					
	a)	Define "Resolving Power". Discuss Raleigh criteria for the same. Derive the formula for the resolution limit of an optical transmission grating.	4	1	4	1	
	b)	Light containing two wavelengths λ_1 and λ_2 falls normally on a plano-convex lens of radius R resting a glass plate. If the n^{th} dark ring due to wavelength λ_1 coincides with the $(n+1)^{th}$ dark ring due to λ_2, prove that the radius of the dark ring of λ_1 is $\sqrt{\frac{\lambda_1\lambda_2 R}{\lambda_1 - \lambda_2}}$	2	1	3	1	
	c)	Define polarization. Describe one method to produce polarized light with the help of neat and clean diagram.	2	1	2	1	
Q3.		Attempt two parts of the following. Part (a) is compulsory. (Unit-II)					
	a)	Derive the formula for the normalized Wave-function and Energy Eigen values for a particle trapped in one dimensional infinite potential box. Draw neat and clean diagram to explain it.	4	2	3	1	
	b)	Discuss the concept of group velocity and reduce the Heisenberg Uncertainty principle.	2	2	4	2	
	c)	Derive Time Dependent Schrodinger equation.	2	2	3	3	

BL – Bloom's Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analysing, 5 – Evaluating, 6 - Creating)

CO – Course Outcomes

PO – Program Outcomes

BSM-131	ROLL NO.	2	0	1	

B. Tech. (3/4/5Credit Subjects)
Year: 2025-26 Semester: Odd
Major Examination
ENGINEERING PHYSICS

Time: 3 Hrs. **Max Marks: 50**

Note: Attempt ALL questions. Each question carries equal marks

Q1.		Attempt any Five parts of the following. (Unit I & II)	Marks	CO	BL	PO	PI Code
	a)	Show that the ratio of the intensities in a Fraunhofer diffraction phenomenon from a single slit can be given by $I_0 : I_1 : I_2 : \ldots\ldots\ldots = 1 : 0.045 : 0.016 : \ldots\ldots$	2	1	3	1	
	b)	Define polarization of light and explain it using appropriate neat and clean diagram. What do you mean by linearly, circularly and elliptically polarized light? Explain.	2	2	2	1	
	c)	Write down de Broglie hypothesis and explain it. What will be the ratio of de Broglie wavelengths of an electron and a neutron, if both have the same kinetic energy?	2	3	3	2	
	d)	Derive time dependent Schrödinger equation. Explain the physical significance of wave function giving one appropriate example. Write energy and momentum operators and explain their significance.	2	3	3	1	
	e)	Describe Davission-Germer experiment with the help of neat and clean diagram. How could it prove the wave nature of kinetic electrons?	2	4	3	2	
	f)	A hydrogen atom is 5.3×10^{-11} m in radius. Use the uncertainty principle to estimate the minimum energy an electron can have in the atom?	2	4	4	2	
	g)	Show that the ratio of energies of a particle trapped in a one dimensional box is 1:4:9…..	2	4	3	1	
Q2.		**Attempt any Two parts of the following. (Unit-III)**					
	a)	Write down Maxwell's electromagnetic equations in integral and differential forms for free space and explain their physical significance.	5	5	3	1	
	b)	Derive the wave equation for an electromagnetic wave and show that the electromagnetic waves travel with a constant speed c (3×10^8 m/s)	5	5	3	1	
	c)	Derive the first and second Maxwell equations and explain their physical significance.	5	5	3	1	
Q3.		**Attempt any Two parts of the following. (Unit-III)**					