

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur (GIET University)



B. Tech (Second Semester - Regular) Examinations, April 2026

25FYBS10003– Applied Physics

(Common to All branch)

Time: 3 hrs

Maximum: 60 Marks

Answer ALL questions
(The figures in the right hand margin indicate marks)

PART – A

(2 x 5 = 10 Marks)

Q.1. Answer **ALL** questions

	CO #	Blooms Level
a. Graphically show three types of damped harmonic oscillator along with their conditions of occurrence.	CO1	K1
b. Why magnetic monopole does not exist?	CO2	K1
c. Write the two applications of Fibre Optics.	CO3	K1
d. Define Isotope effect of a superconductor.	CO4	K1
e. If mass of Harry is 78 kg and moving with velocity 10 m/s then calculate the De-Broglie wavelength of Harry.	CO5	K2

PART – B

(10 x 5 = 50 Marks)

Answer **ALL** the questions

	Marks	CO #	Blooms Level
2.a What is Damped harmonic oscillator? Set up the differential equation for a damped harmonic oscillator. Find the solution for the under damped oscillation.	10	CO1	K2
(OR)			
b. Derive an expression for the diameters of the dark and bright rings in Newton's Ring Experiment.	7	CO1	K2
c. Find the diameter of 5 th dark ring if wavelength of incident light and radius of Plano-convex lens are 6000 Å and 100 cm respectively.	3	CO1	K2
3.a (i) State Gauss divergence theorem.			
(ii) Evaluate Curl of the vector field, $B = (2x + y)\hat{i} - 5yz\hat{j} + 6z\hat{k}$	6	CO2	K2
(iii) Calculate the Gradient of the scalar field, $\phi = x^2 + y^2 + z^2$			
b. Differentiate between conduction current and displacement current.	4	CO2	K1
(OR)			
c. State and prove Gauss law of electrostatics.	5	CO2	K2
d. State and prove Faraday law of electromagnetism.	5	CO2	K2
4a. Determine the reciprocal lattice of Body Centred Cubic (BCC) crystal lattice.	10	CO3	K1
(OR)			
b. What is Miller Indices? Discuss the methods to determine the Miller Indices of a crystal plane? Explain with example.	7	CO3	K2
c. State Bragg's law of crystal diffraction.	3	CO3	K1
5.a Discuss the block diagram of Fibre Optic Communication Link (FOCL).	6	CO4	K1
b. Write different parts of optical fibre. In an optical fibre, the core material has refractive index 1.6 and refractive index of the cladding material is 1.3. Calculate the value of Numerical Aperture?	4	CO4	K2

(OR)

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|---|---|-----|----|
| c. Explain in detail about the Step index and Graded index optical fibre? | 4 | CO4 | K1 |
| d. Discuss briefly about the Diamagnetic, Paramagnetic & Ferromagnetic materials. | 6 | CO5 | K1 |
| 6a. Discuss Einstein's concepts of Photoelectric effect. | 5 | CO5 | K2 |
| b. Write the physical significance of a quantum mechanical wave function? An X-ray having wavelength $1.2 \text{ \AA}$ is scattered by carbon block at 60° . Find out the Compton shift and wavelength of scattered photons. | 5 | CO6 | K2 |

(OR)

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| c. Explain Heisenberg Uncertainty principle? Using Heisenberg Uncertainty principle prove that electron is absent inside the nucleus. | 10 | CO6 | K1 |
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