QP Code: R251G024 | Reg. No | | | | | | | | | | | AY 24

GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY, ODISHA, GUNUPUR
(GIET UNIVERSITY)

M.Sc. (First Semester - Regular) Examinations, February – 2025

24MBIPC11007 – Basics of Chemistry and Physics

(Biotechnology)

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)**

		CO #	Blooms Level
Q.1.	Answer ***ALL*** questions		
a.	Find the mass of Na_2CO_3 present in 100 ml of 3 molar solutions.	CO1	K1
b.	Write down the unit of rate constant.	CO2	K1
c.	Calculate the capacitance of an empty parallel plate capacitor with plate area 1 m^2 separated by a distance 100 mm.	CO3	K1
d.	Define mechanical wave.	CO4	K1
e.	State Ohm's law.	CO4	K1

PART – B **(10 x 5 = 50 Marks)**

		Marks	CO #	Blooms Level
	Answer ***ALL*** the questions			
2. a.	Brief basics and principle of mass spectrometry.	6	CO1	K1
b.	Explain Nernst Equation.	4	CO1	K1
	(OR)			
c.	Explain light matter interaction.	4	CO1	K1
d.	Compare the hybridization, shape and structure of CH_4, NH_3, H_2O	6	CO1	K2
3.a.	Explain Arrhenious equation.	10	CO2	K2
	(OR)			
b.	Derive Maxwell Boltzman distribution law	10	CO2	K2
4.a.	Define Wave. Explain the types of wave.	6	CO3	K2
b.	Write down the relation between free energy, enthalpy and entropy	4	CO3	K2
	(OR)			
c.	If two charged particles of charge 1C and 5C are separated by a distance 5m then find the electrostatic force between them.	4	CO3	K2
d.	Distinguish between conduction, convection and radiation.	6	CO3	K2
5.a.	What is simple harmonic oscillator? Derive the differential equation of a simple harmonic oscillator?	10	CO4	K3
	(OR)			
c.	Explain with neat diagram the concept of capacitor/Derive an expression of a parallel plate and spherical capacitor.	10	CO4	K3
6.a.	Define Newton's law of Gravitation. Derive relation between acceleration due to gravity and weight?	10	CO5	K3
	(OR)			
b.	Write Newton's Three laws of motion with example. Differentiate between coherent and incoherent superposition?	10	CO5	K2

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