Reg. No | | | | | | | | | | |

AY 25

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

M.Sc. (First Semester - Regular) Examinations, January – 2026

Basics of Mathematics and Statistics

(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.	Evaluate $\int 7z^2(14+8z^3)^{-5}dz$.	CO1	K1
b.	Express the following expression in $a+ib$ form: $\left(\frac{1}{5}+i\frac{2}{5}\right)-\left(4+i\frac{5}{2}\right)$	CO2	K2
c.	What are independent and dependent events? Explain with examples.	CO3	K1
d.	If $A=\begin{bmatrix}2 & 5 & 7\\ 2 & -1 & 0\\ 3 & 4 & 8\end{bmatrix}$ $B=\begin{bmatrix}1 & 4 & 9\\ 3 & -2 & 4\\ -5 & 6 & 8\end{bmatrix}$ verify that $(A+B)^T=A^T+B^T$	CO2	K3
e.	Define ordinal or ranking scale.	CO4	K1

PART – B **(10 x 5 = 50 Marks)**

		Marks	CO #	Blooms Level
	Answer ***ALL*** the questions			
2. a.	Solve: $\int \frac{x^3-1}{x^2}dx$	5	CO1	K1
b.	Solve: $\int \frac{1-\sin x}{cos^2 x}dx$	5	CO1	K1
	(OR)			
c.	If $A=\begin{bmatrix}6 & -3 & 7\\ 1 & 4 & 2\\ 0 & 5 & 4\end{bmatrix}$ and $B=2A, C=B+3A-5I$. Find matrix D such that $D=2A+B-C$.	10	CO2	K3
3.a.	What are the different types of symmetry in biological system? Discuss about them.	10	CO3	K2
	(OR)			
b.	Find the inverse of $\begin{bmatrix}0 & 1 & 2\\ 1 & 2 & 3\\ 3 & 1 & 1\end{bmatrix}$.	10	CO2	K3
4.a.	Find the multiplicative inverse of the complex number $4-5i$.	5	CO2	K2
b.	Evaluate $\int_1^9 \frac{2x^2+x^2\sqrt{x}-1}{x^2}$.	5	CO1	K2
	(OR)			
c.	If $6x+i(4x-y)=6+i(-2)$, where x and y are real numbers, then find the values of x and y.	5	CO3	K2
d.	Do the following conversions. i. Convert 4 radians into degree measure. ii. Convert 35 degree into radian measure.	5	CO4	K2
5.a.	Define lipids and classify them with suitable examples.	10	CO5	K1

(OR)

b. Solve the following linear equations: (y-3)/4+(y-1)/5-(y-2)/3=1 — 5 CO3 K2

c. Find the derivative of the following function: $F(z) = \frac{6}{\sqrt{z^3}} + \frac{1}{8z^4} - \frac{1}{3z^{10}}$ — 5 CO4 K2

6.a. Calculate the coefficient of correlation from the following data: — 10 CO4 K3

x	105	104	102	101	100	99	98	96	93	92
y	101	103	100	98	95	96	104	92	97	94

(OR)

b. What are the types of probability sampling? Discuss about them. — 10 CO3 K2

--- End of Paper ---