Reg. No										

AY 24

GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

B.C.A. (First Semester) Regular Examinations, January – 2025

BCA23104 – Basic Mathematics

(BCA)

Time: 3 hrs | Maximum: 60 Marks

(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.	Compute i. $(2!)^3$ ii. $\frac{1}{8!}+\frac{1}{9!}+\frac{1}{10!}$.	CO1	K1
b.	If $Cos\theta = \frac{5}{6}$,then find all trigonometric ratio.	CO1	K1
c.	Find the equation of circle passing through (2,3) and (4,5).	CO2	K1
d.	Find the limit of $\lim_{x\to 0}\frac{\sqrt{5+x}-\sqrt{5-x}}{x}$	CO2	K2
e.	Find the Integration of $\int(e^{3x}+\frac{3}{x}+a^x)dx$	CO1	K2

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** questions		Marks	CO #	Blooms Level
2. a.	Let A=$\begin{bmatrix}1 & -2 & 5\\ 4 & 4 & 8\\ -3 & 1 & 0\end{bmatrix}$ and B=$\begin{bmatrix}5 & 2 & 0\\ -5 & 3 & -4\\ -4 & 2 & -4\end{bmatrix}$. Find A+B, A-B ,2A+3B ,2B+3A, A-2B, AB.	6	CO3	K2
b.	Show that P(m,1) +P(n,1) =P (m + n ,1) for all positives integers.	4	CO3	K2
	(OR)			
c.	Solve by Cramer's rule $x+y+z=6$, $y+3z=11$, $x-2y+z=0$	6	CO3	K2
d.	Find x, y, z and w, where $3\begin{bmatrix}x & y\\ z & w\end{bmatrix}=\begin{bmatrix}x & 6\\ -1 & 2w\end{bmatrix}+\begin{bmatrix}4 & x+y\\ z+w & 3\end{bmatrix}$	4	CO3	K2
3.a.	Prove that $(Cosec\theta-\cot\theta)^2=\frac{1-\cos\theta}{1+\cos\theta}$	4	CO3	K3
b.	Find Cos 3A , Sin3A, tan 3A .	6	CO3	K3
	(OR)			
c.	Find the following i. $\sin(A+B)+\sin(A-B)$ ii. $\cos(A+B)+\cos(A-B)$	5	CO3	K3
d.	If $\sec\theta=\frac{13}{5}$ then find $\frac{2\sin\theta-3\cos\theta}{4\sin\theta-9\cos\theta}$.	5	CO3	K3
4.a.	Check that the points $(-2,7)$, $(1,1)$ and $(3,-3)$ is collinear or not.	5	CO2	K2
b.	Find the distance from $(-3,-4)$ to the line $2x-5y+65=0$	5	CO3	K2
	(OR)			
c.	Find the angle between two straight lines $x-y=0$ and $x+y=0$	5	CO2	K2
d.	Show that A(−3,1) B(5,4) C(0,−7) is an isoscales triangle.	5	CO3	K2
5.a.	Find the Derivative of i.$e^{\sqrt{sinx}}+e^{\sqrt{cosx}}$ ii.$log\sqrt{sinx}+logcosx$ iii. $e^{\sqrt{cosx}}$	5	CO3	K2
b.	Find i. $\lim_{x\to\infty}\frac{x^2+2x+5}{4x^2+5x+6}$ ii. $\lim_{x\to -2}(3x^2+5x-9)$ iii. $\lim_{(x,y)\to(2,3)}\frac{x^2+xy+y^2}{x^3y^3}$	5	CO3	K3
	(OR)			

c.	Find the derivative of i.$\left[\frac{x^2+1}{(x^3-3x)}\right]$ ii. Sin2x+e^{3x} iii.$\sqrt{sinx+cosx}$	6	CO3	K2
d.	If Z=x^2+y^2+2xy ,then prove that $xZ_x+yZ_y=2Z$	4	CO3	K3
6.a.	Find the Integration of *i*. $\int 2x\sqrt{1+x^2}\,dx$ ii. $\int \frac{Sin\sqrt{x}}{\sqrt{x}}$dx iii. $\int \frac{Cos\sqrt{x}}{\sqrt{x}}$dx	6	CO3	K3
b.	Find the area under the curve f(x)=x^2+1 from a=2 to b=3	4	CO3	K2
	(OR)			
c.	Find the integration i.$\int \frac{x^3+3x+4}{\sqrt{x}}dx$ ii. $\int \frac{x^3+5x^2-4}{x^2}dx$ iii.$\int x^2\left(1-\frac{1}{x^2}\right)dx$	6	CO3	K3
d.	Find the area bounded by $y=e^x$ b=4 and a=2	4	CO3	K2

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