GIET UNIVERSITY, GUNUPUR – 765022

BCA (First Semester) Examinations, January – 2024

BCA23104 - Basic Mathematics

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

	Question	CO #	Blooms Level
a.	Find the Adjoint matrix of $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$.	CO1	K1
b.	If $15\cot\theta = 8$,then find all trigonometric ratio.	CO1	K1
c.	$Find\ the\ equation\ of\ circle\ passing\ through\ (-1,-2)\ and\ radius\ is\ \sqrt{3}.$	CO1	K1
d.	Find the Limit of $\lim_{x\to 1} \frac{2x^3-3x^2+1}{9x^2+8x+7}$	CO2	K2
e.	Find the integral of $\int \frac{e^{2x}+1}{e^x} dx$	CO2	K2

PART – B **(10 x 5 = 50 Marks)**

<u>Answer ***ALL*** questions</u>

	Question	Marks	CO #	Blooms Level
2. a.	Write as the sum of symmetric and skew-symmetric matrix of A=$\begin{bmatrix} 2 & -1 & 3 \\ 5 & 7 & -2 \\ 1 & 4 & 6 \end{bmatrix}$	5	CO3	K2
b.	Solve by Cramer's rule $x + y + z = 4$,$2x - y + 3z = 1$,$3x + 2y - z = 1$	5	CO3	K2
	(OR)			
c.	Let A=$\begin{bmatrix} 1 & -2 & 5 \\ 4 & 4 & 8 \\ -3 & 1 & 0 \end{bmatrix}$ and B=$\begin{bmatrix} 5 & 2 & 0 \\ -5 & 3 & -4 \\ -4 & 2 & -4 \end{bmatrix}$ .Then find A+B, A-B , 2A+3B, A-2B, 2A+B.	5	CO3	K2
d.	If A=$\begin{bmatrix} 1 & 2 \\ 2 & 3 \\ 3 & 4 \end{bmatrix}$ B=$\begin{bmatrix} 2 & 3 & 0 \\ 1 & 2 & 3 \end{bmatrix}$ then Proov that $[AB]^T = B^T . A^T$	5	CO3	K2
3.a.	If $\sec\theta = \frac{13}{5}$,then prove that $\frac{2\sin\theta - 3\cos\theta}{4\sin\theta - 9\cos\theta} = 3$.	5	CO3	K3
b.	Prove that $\frac{\cot A - \cos A}{\cot A + \cos A} = \frac{\cos e A - 1}{\operatorname{cosec} A + 1}$	5	CO3	K3
	(OR)			
c.	Find $\tan 2A$, $\cos 2A$, $\sin 2A$.	6	CO3	K3
d.	Prove that $\sec A(1 - \sin A)(\sec A + \tan A) = 1$	4	CO3	K3

4.a.	Find the equation of straight line passing through points (3,4) and havingsum of intercept is 14.	5	CO2	K2
b.	Find the distance from $(-3,-4)$ to the line $2x-5y+65=0$	5	CO3	K2
	(OR)			
c.	Find the equation of normal to the circle $x^2+y^2+6x+4y+10=0$ at point (2,3).	5	CO2	K2
d.	Find the point by using section formula of points $(3,4),(5,2)$ with ratio $3:2$.	5	CO3	K2
5.a.	Find the Total derivative $\frac{dU}{dt}$. $u=x^3+y^3\ \ x=a\cos t\ \ y=b\sin t$	4	CO3	K2
b.	Find the derivative of i. y=.$\frac{x^2+3x-1}{x^2+3x-4}$ ii. y=.$\frac{x^2-1}{x^2+3x}$	6	CO3	K3
	(OR)			
c.	Find f_{xx} , f_{yy} ,f_{zz}. i.$x^2y^2z^2$ ii. $x^2+y^2+z^2$	5	CO3	K2
d.	Find the Maxima and Minima of $y=x^2+2x+3$.	5	CO3	K3
6.a.	Find the Integration of i.$\int\frac{2-3\sin x}{\cos^2 x}dx$ ii.$\int\frac{\sec^2 x}{\operatorname{cosec}^2 x}dx$ iii.$\int \sec x(\sec x+\tan x)dx$	6	CO3	K3
b.	Calculate the area under the curve of a function,$f(x)=7-x^2$, as the limit is given as $a=-1$ to $b=2$	4	CO3	K2
	(OR)			
c.	Find the integral of i.$\int(ax+b)^n dx$ ii.$\int \sin(ax+b)dx$ iii. $\int\cos(ax+b)dx$ iv.$\int\sec^2(ax+b)\,dx$ v. $\int \mathrm{Cosec}^2(ax+b)\,dx$	5	CO3	K3
d.	Find the integral of i. $\int_1^2\frac{1}{\sqrt{x}}dx$ ii. $\int_{-1}^{2}(x^2+2x+5)dx$	5	CO3	K2

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