QPC: RM22BCA007 AR 22 Reg. No

GIET UNIVERSITY, GUNUPUR – 765022

B. C. A (First Semester) Examinations, March' 2023

BCA20104 – BASIC MATHEMATICAL COMPUTATION

Time: 3 hrs Maximum: 70 Marks

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) **(1 x 10 =10 Marks)**

Q. 1 Answer ***ALL*** questions

CO # PO #

a. Find $x \ and \ y$. $[2x \quad -y] + [y \quad 3x] = 5[1 \quad 0]$ CO1 PO1

(i) $x = 1 , y = 2$ (ii) $x = 1 , y = 3$

(iii) $x = -1 , y = 2$ (iv) $x = 3 , y = 1$

b. The determinanat value of $\begin{vmatrix} 0.2 & 0.1 & 3 \\ 0.4 & 0.2 & 7 \\ 0.6 & 0.3 & 2 \end{vmatrix}$ is CO1 PO1

(i)0 (ii) 1

(iii) 0.2 (iv) None of these

c. The slope of the line joining the points $(1,4) \ and \ (3,5) \ is$ CO2 PO1

(i)$\frac{1}{2}$ (ii)$\frac{1}{3}$

(iii)2 (iv)None of these

d. The equation of tangent at $(1,2) \ lying \ on \ the \ circle \ x^2 + y^2 = 4$. CO2 PO1

(i) $x + 2y = 4$ (ii)$2x + y = 2$

(iii) $x - 2y = 4$ (iv) $2x + y - 2 = 0$

e. Find $\lim_{(x,y)\to(2,1)} \left(\frac{x^2-4y}{x-2y}\right)$ is CO3 PO1

(i)0 (ii)4

(iii) 2 (iv)Cant not find

f. Find f_x ,where f=Sinxy CO3 PO1

(i) $ycosxy$ (ii) $xsinxy$

(iii) $ycosx$ (iv) 0

g. Find the degree of the homogeneous function $ax^2 + by^2 + 2hxy$ is CO3 PO1

(i) -2 (ii)3

(iii)2 (iv) 1

h. Find the integration of 3^{2x} CO4 PO1

(i) $\frac{3^{2x}}{3loga} + C$ (ii) $\frac{3^{2x}}{2log3} + C$

(iii) $\frac{3^{2x}}{loga} + C$ (iv) None of these

i. Find the value of $\int_0^1 x \, dx$ is CO4 PO1

(i) 0 (ii) $\frac{1}{2}$

(iii) 2 (iv) None of these

j. Compute $5! + 6!$ is CO1 PO1

(i) 840 (ii) 320

(iii) 110 (iv) None of these

PART – B: (Short Answer Questions) **(2 x 10 = 20 Marks)**

Q.2. Answer ***ALL*** questions

		CO #	PO #
a.	Find the Middle term of $(x^2 + a^2)^5$	CO1	PO2
b.	Find x,y .Where $\begin{bmatrix}1 & 3\\2 & -1\end{bmatrix}\begin{bmatrix}x\\y\end{bmatrix} = \begin{bmatrix}4\\1\end{bmatrix}$.	CO1	PO2
c.	State Langranges's Theorm.	CO3	PO1
d.	Verify the Euler's theorm. Where f=$\cos^{-1}\frac{x}{y}$.	CO3	PO2
e.	Find the $\int (a\,tanx + bcotx)^2\,dx$	CO4	PO2
f.	Find the value of definite integral $\int_0^1 xe^{x^2}dx$	CO4	PO2
g.	Find the equation of circle $x^2 + y^2 = 4$ which is inclined by 45^0 with X-axis.	CO2	PO1
h.	Find the equation of straight line which passes through $(1.-2)\ and\ (2,-3)$.	CO2	PO1
i.	Find the derivative $\frac{dy}{dx}$ .Where y=$\sqrt{(sin\sqrt{x})}$	CO3	PO2
j.	Construct the matrix of $order\ 2\times 3\ , where\ a_{ij} = 2i + j$.	CO1	PO2

PART – C: (Long Answer Questions) **(10 x 4 = 40 Marks)**

Answer ***ALL*** questions

		Marks	CO #	PO #
3.*a.*	Find the Inverse of the matrix A=$\begin{bmatrix}0 & 1 & 2\\1 & 2 & 3\\3 & 1 & 1\end{bmatrix}$.	5	CO1	PO2
b.	Show that P(m,1)+P(n,1)=P(m+n ,1) for all positives integers.	5	CO1	PO3
	(OR)			
c.	Solve by Cramer's rule $x + y + z = 4\ ,2x - y + 3z = 1, 3x + 2y - z = 1$	5	CO1	PO3
d.	Find the middle term of $\left(2x + \frac{1}{x}\right)^9$.	5	CO1	PO3
4.*a.*	Find the angle between two straight lines $x - y = 0\ and\ x + y = 0$	5	CO2	PO2
b.	Find the equation of the line passing through the point $(0,0)$ and $(-x_1, -y_1)$.	5	CO2	PO3
	(OR)			
c.	. Show that ABC is a Isoscale triangle where $A(-3,1)\ , B(5,4)\ and\ C(0,-7)$.	5	CO2	PO3
d.	Find the equation of the circle which passes through the points $(0,1)\ (1,0)\ and\ (2,1)$.	5	CO2	PO2
5.*a.*	If Z=$x^2 + y^2 + 2xy$,then prove that $xZ_x + yZ_y = 2Z$	4	CO3	PO3
b.	Find the tangent and normal of the curve $y = xe^{-x}$ at x=0	6	CO3	PO2
	(OR)			
c.	Find the total derivative $\frac{dU}{dt}\ where\ U = \sin\left(\frac{x}{y}\right)\ x = e^t\ and\ y = t^2$.	5	CO3	PO2
d.	Expand $2x^3 + 7x^2 + x - 6\ in\ the\ power\ of\ (x - 2)$.	5	CO3	PO3
6.*a*	Find the Integration of $\int \frac{sinx}{sin(x+\alpha)}\,dx$	5	CO4	PO3
b.	.Find the area of the parabola $y^2 = 4ax$ bounded by its latus rectum $x = a$	5	CO4	PO2
	(OR)			
c.	Find the integration of i.$\int \frac{1-cos2x}{1+cos2x}\,dx$ ii.$\int (tanx + cotx)^2\,dx$ iii.$\int \frac{Cos2x}{cosx+sinx}$ dx	6	CO4	PO3
d.	Find the Integration of i.$\int xsinx\,dx$ ii.$\int xe^x\,dx$	4	CO4	PO3

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