25CBA103

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCom DEGREE EXAMINATION MAY 2026
(First Semester)

Branch – **COMMERCE (BUSINESS ANALYTICS)**

MATHEMATICAL TECHNIQUES FOR BUSINESS ANALYTICS

Time: Three Hours | Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	The formula for compound interest is a) P (1+rt) b) P $(1+r/100)^t$ c) P x R x T/100 d) P+RT	K1	CO1
	2	Which of the following is a geometric series? a) 2,4,6,8 b) 3,6,12,24 c) 5,10,15,20 d) 7,14,21,28	K2	CO1
2	3	The inverse of a matrix exists only if the matrix is: a) Rectangular b) Singular c) Non-Singular d) Null	K1	CO2
	4	In an input-output analysis, matrices are used to: a) Represent demand and supply of sectors b) Represent probability distribution c) Represent Annuities d) Represent trigonometric functions	K2	CO2
3	5	The two lines are parallel, their slopes are: a) Equal b) Negative Reciprocals c) Zero d) Undefined	K1	CO3
	6	The slope of the line perpendicular to another with slope 3 is: a) 3 b) -3 c) 1/3 d) -1/3	K2	CO3
4	7	If $y = e^x$, then $\frac{dy}{dx}$ = ? a) 1 b) e^x c) x e^x d) log x	K1	CO4
	8	The maximum / minimum of a function occurs where: a) First derivative = 0 b) Second derivative = 0 c) First derivative is undefined d) None of these	K2	CO4
5	9	If $\int f\,x\,dx = f(x) + c$, then $\frac{d}{dx}[f(x)]$ _____ a) $f(x)^2$ b) $f(x)$ c) c d) f(x)+c	K1	CO5
	10	In economics, consumer's surplus is measured using a) Differentiation b) Integration c) Determinants d) Probability	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Find the present value of an annuity of Rs.5,000 per annum, for 12 years, the interest being 4% per annum compounded annually.	K3	CO1
		(OR)		
	11.b.	*Find the time required to earn Rs.400 as Simple Interest on Rs.4,000 at 5% per annum.*		
2	12.a.	*If* $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, *find* A^2	K3	CO2
		(OR)		
	12.b.	Find the determinant of $\begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$		
3	13.a.	Find the equation of the tangent to the parabola $y^2 = 8x$ at Point (2,4).	K4	CO3
		(OR)		
	13.b.	Find the point of intersection of the lines $2x+3y=13$, $3x - 2y = 4$		
4	14.a.	If $x = at^2$ and $y = 2at$, find $\frac{dy}{dx}$ using implicit function.	K4	CO4
		(OR)		
	14.b.	For the cost function $y=1000x-80x^2+3x^3$ for x units, find the average cost and marginal cost.		
5	15.a.	Integrate with respect to x. $(2x + 3)$	K3	CO5
		(OR)		
	15.b.	*Evaluate* $\int_0^1 (2x + 1)\, dx$.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Compute the interest on Rs. 1,000 for 10 years at 4% per annum, the interest being paid annually.	K2	CO1
2	17	Find the inverse of A[2 1 1] [1 3 2] [1 0 0]	K4	CO2
3	18	Form the equation of the hyperbola with foci at $(\pm 5,0)$ and length of transverse axis = 6.	K6	CO3
4	19	Using successive differentiation. If $y = \frac{ax+b}{cx+d}$, find d^2y/dx^2	K5	CO4
5	20	Find the area bounded by the curves $y = x$ and $y = x^2$	K4	CO5

Z-Z-Z END