22BPU103N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCom DEGREE EXAMINATION MAY 2026
(First Semester)

Branch – **COMMERCE (BUSINESS PROCESS SERVICES)**

MATHEMATICS FOR BUSINESS PROCESS

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	If a term deposit of Rs.4000 earns an interest of Rs.2500 in 50 months, then the rate of interest is (i) 12% (ii) 15% (iii) 20% (iv) 10%	K1	CO1
	2	Infer the Annuity which is paid for ever without any stop (i) Annuity certain (ii) Deferred Annuity (iii) Annuity Contingent (iv) Annuity perpetual	K1	CO1
2	3	If in a square matrix, $a_{ij} = a_{ji}$, then the matrix is called (i) symmetric matrix (ii) skew-symmetric matrix (iii) Hermitian matrix (iv) orthogonal matrix	K1	CO2
	4	A matrix is called an nilpotent matrix if A satisfies (i) $A^2 = I$ (ii) $A^2 = A$ (iii) $A^n = 0$ (iv) $A^n = A$ for some n	K1	CO2
3	5	The characteristic equation of a matrix A is (i) $\|A - \lambda I\| = 0$ (ii) $\|A + \lambda I\| = 0$ (iii) $\|\lambda A - I\| = 0$ (iv) $\|\lambda I - A\| = 0$	K1	CO3
	6	If λ is an eigenvalue of matrix A, what is an eigenvalue of 2A? (i) λ (ii) λ^2 (iii) 2λ (iv) $\frac{1}{\lambda}$	K1	CO3
4	7	The value of $\frac{d}{dx}(x^2)$ *is* (i) 2x (ii) 2 (iii) x^2 (iv) x	K1	CO4
	8	If the value of Marginal revenue is 60 – 12x then at what value of x Marginal revenue is equal to zero (i) 5 (ii) 50 (iii) 0.5 (iv) 40	K1	CO4
5	9	The formula for integration by parts is $\int udv$ is (i) $uv - \int vdu$ (ii) $uv - \int udv$ (iii) $uv + \int udv$ (iv) $uv + \int vdu$	K1	CO5
	10	The value of $\int dx$ is (i) x+c (ii) 0 (iii) 1+c (iv) x	K1	CO5

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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.	A sum of money amounted to Rs. 1,071 in 6 months and Rs.1,106 in 16 months. Calculate the rate of simple interest.	K2	CO1
		(OR)		
	11.b.	Mr. X borrows Rs.20,000 at 4% compound interest and agrees to pay both the principal and the interest in 10 equal installments at the end of each year. Find the amount of these instalments		
2	12.a.	Find the rank of the matrix $\begin{pmatrix} 1 & 2 & 1 & -1 \\ 2 & 4 & 1 & 2 \\ 3 & 6 & 2 & 1 \end{pmatrix}$	K2	CO2
		(OR)		
	12.b.	Determine whether the vectors (5, −2, 4), (2, −3, 5), and (4, 5− 7) are linearly independent or dependent.		
3	13.a.	If $A = \begin{bmatrix} 1 & -2 \\ 2 & 1 \end{bmatrix}$ .Find A^{-1} in terms of A and I , using Cayley Hamilton theorem	K2	CO3
		(OR)		
	13.b.	Find the eigen values of $\begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{bmatrix}$		
4	14.a.	Evaluate $\frac{dy}{dx}$ if (i) $y = x^x$ (ii) $y = log(5x + 7)$	K2	CO4
		(OR)		
	14.b.	If $C(x)$ rupees is the total cost of manufacturing xtoys and $C(x) = 500 + \frac{50}{x} + \frac{x^2}{10}$. Find the average cost and the marginal cost when $x = 20$.		
5	15.a.	Integrate $e^x - 1$ with respect to x	K2	CO5
		(OR)		
	15.b.	Find the elasticity of supply from the supply function p= -2+5x		

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	(a) A Person has two daughters A and B aged 13 and 16 years . He has Rs.40,000 with him now but wants that both of them should get an equal amount when they are 20 years old. How he should divide the money if it were to be deposited in a bank giving 9% compound interest per annum? (b) A bill for Rs.1825 was drawn on 22nd January at 6 months date and discounted on 16th April at the rate of 10% per annum. Find the sum for which the bill was discounted and the banker's gain.	K2	CO1
2	17	Test for consistency and hence solve $x + y + z = 6; x + 2y - 2z = -3; 2x + 3y + z = 11$	K2	CO2
3	18	Find the Eigen values and Eigen Vectors of the matrix $A = \begin{bmatrix} -5 & 2 \\ -7 & 4 \end{bmatrix}$	K2	CO3
4	19	Identify and find the maxima and minima of the function $2x^3 - 21x^2 + 36x - 20$.	K3	CO4
5	20	(a)Evaluate $\int \frac{dx}{(x-1)(x^2-5x+6)}$ (b) If the marginal revenue function is $R'(x) = 15 - 9x - 3x^2$. find the revenue function and demand function.	K3	CO 5

Z-Z-Z END