PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCom DEGREE EXAMINATION DECEMBER 2025
(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	Which of the following is true? a) The amount borrowed by the debtor is called Principal b) The amount borrowed by the debtor is called Simple interest c) The amount borrowed by the debtor is called Amount d) The amount borrowed by the debtor is called interest	K1	CO1
	2	Identify and find the simple interest on the sum of Rs.6000 at 10% p.a for 3 years. a) 2000 b) 1800 c) 1850 d) 600	K2	CO1
2	3	A square matrix that satisfies the relation $A^2 = A$ is called ____matrix. a) idempotent b) nilpotent c) adjoint d) inverse	K1	CO2
	4	A system of equations is said to be inconsistent a) R(A)=R(A,B) b) R(A)≠R(A,B) c) R(A)<R(A,B) d) R(A)>R(A,B)	K2	CO2
3	5	Two of the eigen value of a 3x3 matrix ,whose determinant equals 4 are -1 and 2,find the third eigen value. a) 2 b) -2 c) 4 d) -4	K1	CO3
	6	For a triangular matrix the eigen values are ____. a) triangular b) symmetric c) skew symmetric d) leading diagonal elements	K2	CO3
4	7	Choose the derivative of $\sqrt{x}$. a) $\frac{1}{\sqrt{x}}$ b) $\frac{1}{2\sqrt{x}}$ c) $\frac{1}{x}$ d) $\frac{1}{\sqrt{x}}$	K1	CO4
	8	Interpret the elasticity of demand for the demand function $X = \frac{1}{P}$. a) 0 b) 1/p c) 1 d) ∞	K2	CO4
5	9	Interpret $\int_1^2 x\,dx$. a) 5/2 b) 3/2 c) 1/2 d) 2	K1	CO5
	10	Recall from below that Integration of marginal cost function gives ___function. a) total cost b) total revenue c) average cost d) marginal revenue	K2	CO5

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.	Illustrate and Find the compound interest on Rs.20,000 for 5 years at 20% per annum.What will be the simple interest in the above case?	K2	CO1
		(OR)		
	11.b.	Illustrate and find the effective rate of interest percent per annum equivalent to a nominal rate 12% per annum,the interest being payable half yearly.		

Cont...

2	12.a.	If A=$\begin{bmatrix}3 & -4\\1 & 1\\2 & 0\end{bmatrix}$ and B=$\begin{bmatrix}2 & 1 & 2\\1 & 3 & 4\end{bmatrix}$ show that $(AB)' = B'A'$.	K2	CO2
		(OR)		
	12.b.	Interpret and find the rank of the matrix A=$\begin{bmatrix}1 & 2 & 5\\2 & 3 & 4\\3 & 5 & 7\end{bmatrix}$.		
3	13.a.	Illustrate and find the characteristic equation of A=$\begin{bmatrix}-2 & 2 & -3\\2 & 1 & -6\\-1 & -2 & 0\end{bmatrix}$.	K2	CO3
		(OR)		
	13.b.	Illustrate and find the sum and product of the eigen values of A=$\begin{bmatrix}2 & 1 & 1\\1 & 2 & 1\\0 & 0 & 1\end{bmatrix}$.		
4	14.a.	Utilize differentiation and find $\frac{dy}{dx}$ if (i)y =$(x^2-7)^2$ (ii)y=$(x^2+5)(3x+1)$.	K3	CO4
		(OR)		
	14.b.	If the demand function is p=4-5x,for what values of x will elasticity of demand be unitary?		
5	15.a.	Solve $\int x^2e^x\,dx$ by integration by parts.	K3	CO5
		(OR)		
	15.b.	The marginal cost function for producing x units is y=23+16x-3x^2 and the total cost for producing 1 unit is 40.Obtain the total cost function and the average cost function.		

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	(i)The difference between the compound interest and the simple interest for 3 years at 5% p.a on a certain sum of money was Rs.610.Find the sum. (ii)The banker's gain on a sum due 10 months hence at 6% p.a. is Rs.25.Illustrate and Find the sum due.	K2	CO1
2	17	Test for consistency and hence solve $x-2y+3z=2; 2x-3z=3; x+y+z=0$.	K2	CO2
3	18	Interpret and find the eigen value and eigen vector of the matrix $\begin{bmatrix}2 & 0 & 1\\0 & 2 & 0\\1 & 0 & 2\end{bmatrix}$.	K2	CO3
4	19	(i) Utilize chain rule and find $\frac{dy}{dx}$ if y =log$\sqrt{2x+3}$ (ii)Find the maximum and minimum value of function y=$2x^2-6x+4$.	K3	CO4
5	20	Utilize Partial fraction and solve $\int \frac{(x^2+x+1)\,dx}{(x-1)^2(x-2)}$.	K3	CO5

Z-Z-Z END