PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BCom DEGREE EXAMINATION DECEMBER 2025
(Second Semester)
Common to Branches – **COMMERCE (RM) / COMMERCE (FS) / COMMERCE (FT)**

MATHEMATICS FOR COMMERCE

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	A state levies 12% sales tax . what is the tax on a car listed at Rs.42,300. a) Rs.48,300 b) Rs.5,076 c) 18,200 d) 7,320	K1	CO1
	2	Infer the n^{th} term of geometric series a) ar^{n-1} b) ar^n c) ar^{n+1} d) ar	K2	CO1
2	3	A square matrix such that aij = -aji for all i and j is defined as — matrix. a) Symmetric b) Skew-symmetric c) Diagonal d) Triangular	K2	CO2
	4	In the system of linear equations $AX = B$, if $B = 0$, then the system is a _____ a) non-homogeneous b) homogeneous c) linear d) non-linear	K2	CO2
3	5	Find $\frac{dy}{dx}$ of implicit function $x^2 + y^2 = a^2$ a) x/y b) $-y/x$ c) $-x/y$ d) y/x	K2	CO3
	6	If the value of Marginal revenue is 60 – 12x then at what value of x marginal revenue is equal to zero a) 40 b) 50 c) 0.5 d) 5	K2	CO3
4	7	Find the value of $\int(e^x - 1)dx$ a) $e^x - x + c$ b) $e^x + x + c$ c) $e^{-x} - x + c$ d) $e^{-x} + x + c$	K1	CO4
	8	Infer the value of $\int_0^2 (x^2 - 4x + 5)dx$ a) $\frac{11}{3}$ b) $\frac{14}{3}$ c) $\frac{8}{3}$ d) $\frac{7}{3}$	K2	CO4
5	9	In LPP a pivot element is always… a) Positive b) either positive or negative c) Negative d) None	K1	CO5
	10	Infer that when all the basic variables are non-zero, the basic solution is called _____ a) degenerate b) unbounded c) infinite d) non-degenerate	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.	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?	K3	CO1
		(OR)		
	11.b.	i) Find the sum of n terms of the series 6+66+666+….. . ii)A free hold estate worth Rs. 125 a year is sold for Rs. 4000. Find the rate of interest.		CO1
2	12.a.	Find the inverse of $A = \begin{pmatrix} 4 & 0 & 2 \\ 2 & 10 & 2 \\ 3 & 9 & 1 \end{pmatrix}$.	K3	CO2
		(OR)		
	12.b.	Solve by using Matrix inversion method 2x + 3y- z = 9 , x+ y+ z = 9 , 3x- y – z = -1.		

Cont…

3	13.a.	Find the derivative of $y = x^x$	K3	CO3
		(OR)		
	13.b.	If $y = ax^2 + bx$. Show that $x^2 \frac{d^2y}{dx^2} - 2x\frac{dy}{dx} + 2y = 0$		
4	14.a.	Prove that $\int_0^1 \frac{xdx}{1+x^2} = \frac{1}{2}\log 2$	K3	CO4
		(OR)		
	14.b.	Solve $\int x^2 e^x dx$ by integration by parts		
5	15.a.	A person requires at least 10, 12 and 12 units of the chemicals P, Q and R respectively for his garden. A liquid product contains 1, 2 and 4 units of P, Q and R respectively per jar.A dry product contains 5, 2 and 1 units of P, Q and R per carton. The liquid product sells for Rs.3 per jar and the dry product sells for Rs.2 per carton. Formulate this as an LPP for minimizing the cost.	K3	CO5
		(OR)		
	15.b.	Solve by graphical method: $Max\ Z = -3x + 4y$ Subject to the constraints $x + y \leq 4$; $2x + 3y \geq 18$ and $x, y \geq 0$.		

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 bill for Rs.1,825 was drawn on 22nd January at 6 months date and discounted on 16th April at the rate of 10% p.a. Find the sum for which the bill was discounted and the banker's gain.	K3	CO1
2	17	Consider an economy of two industries P & Q where the data, in millions of rupees is given below. Determine the output when the final demand changes to 20 for P and 30 for Q.	K3	CO2

Producer	A	B	Final Demand	Total Output
A	14	6	8	28
B	7	18	11	36

3	18	A firm sells a product at Rs.3 per unit is given by $C = 20 + 0.6x + 0.01x^2$. How many units should be made to achieve maximum profit? Verify that the condition for a maximum is satisfied.	K3	CO3
4	19	Evaluate $\int \frac{dx}{(x-1)(x^2-5x+6)}$	K3	CO4
5	20	Use Simplex method to solve the LPP: $Max\ Z = x + y + 3z$ Subject to the constraints $3x + 2y + z \leq 3$; $2x + y + 2z \leq 2$ and $x, y, z \geq 0$.	K3	CO5

Z-Z-Z END