

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BA DEGREE EXAMINATION MAY 2026
(First Semester)

Branch - ECONOMICS

MATHEMATICAL METHODS FOR ECONOMICS - I

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 tool does Mathematical Economics use? (i) Mathematics (ii) History (iii) psychology (iv) Map	K1	CO1
	2	What is the highest power in a Quadratic equation? (i) 0 (ii) 2 (iii) 3 (iv) 4	K2	CO1
2	3	Which formula is used to find the arithmetic progression? (i) $(n-1)d$ (ii) $a*(n-1)$ (iii) $a+(n-1)d$ (iv) $a-(n-1)d$	K1	CO2
	4	Identify the focus of the parabola. (i) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ (ii) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ (iii) $xy = c^2$ (iv) $y^2 = 4ax$	K2	CO2
3	5	Which matrix has only one row? (i) Row matrix (ii) Column matrix (iii) Null matrix (iv) Square matrix	K1	CO3
	6	What is the determinant of $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$? (i) 4 (ii) 1 (iii) 3 (iv) 2	K2	CO3
4	7	What is the co-factor of an element? (i) Determinant (ii) Minor only (iii) Minor with sign (iv) Transpose	K1	CO4
	8	What type of matrix is A if $\det(A)=0$? (i) Identity (ii) Non-singular (iii) Invertible (iv) Singular	K2	CO4
5	9	Identify the condition for Hawkins-Simon condition. (i) $ I - A > 0$ (ii) $ I - A = 0$ (iii) $ A = 0$ (iv) $ A = 1$	K1	CO5
	10	Which condition ensures the viability of the input-output model? (i) Rank condition (ii) Hawkins-Simon condition (iii) Identity condition (iv) Symmetry condition	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.	Discuss the merits and demerits of Mathematical Economics.	K2	CO1																							
		(OR)																									
	11.b.	Write a short note on the development of Ancient Indian Mathematics.																									
2	12.a.	Third and Seventh terms of Harmonic progression are $\frac{1}{12}$ and $\frac{1}{32}$ respectively. find the 15th terms.	K2	CO2																							
		(OR)																									
	12.b.	Define a parabola and explain its geometrical construction with a diagram.																									
3	13.a.	Find the value of the determinant $\begin{vmatrix} 3 & 4 & 7 \\ 2 & 1 & 3 \\ 7 & 2 & 1 \end{vmatrix}$	K3	CO3																							
		(OR)																									
	13.b.	If $A = \begin{bmatrix} 2 & 0 \\ -5 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} -3 & 6 \\ 4 & 1 \end{bmatrix}$ Find (i) A+B (ii) A-B.																									
4	14.a.	Obtain inverse of matrix, $A = \begin{bmatrix} 3 & 4 \\ 1 & 2 \end{bmatrix}$.	K4	CO4																							
		(OR)																									
	14.b.	Solve for x and y from the following $2x+3y=7$, $4x+2y=10$.																									
5	15.a.	Describe the assumptions of Input-Output Analysis.	K3	CO5																							
		(OR)																									
	15.b.	The following inter industry fractions table was constructed for an economy for the year 2005 <table border="1"> <thead> <tr> <th>Industry</th><th>1</th><th>2</th><th>Consumption</th><th>Total</th></tr> </thead> <tbody> <tr> <td>1</td><td>500</td><td>160</td><td>400</td><td>2500</td></tr> <tr> <td>2</td><td>1750</td><td>160</td><td>4650</td><td>8000</td></tr> <tr> <td>Labour</td><td>250</td><td>4800</td><td>-</td><td>5050</td></tr> <tr> <td>Total</td><td>2500</td><td>8000</td><td>5050</td><td>15,550</td></tr> </tbody> </table> construct technology coefficient matrix showing direct requirement Does a solution exist for this system?			Industry	1	2	Consumption	Total	1	500	160	400	2500	2	1750	160	4650	8000	Labour	250	4800	-	5050	Total	2500	8000
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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	Demonstrate Partial Equilibrium analysis in details with Mathematical derivatives.	K4	CO1
2	17	Find the equation of a circle which passes through the three points (0, 1), (5, 1) and (2, -3).	K5	CO2
3	18	Find the rank of $A = \begin{bmatrix} 6 & 3 & 5 \\ -10 & 2 & 8 \\ 5 & 2 & 3 \end{bmatrix}$.	K5	CO3
4	19	Solve for x, y, and z from the following linear equations $x-2y+3z=1$, $3x-y+4z=3$, $2x+y-2z=-1$ by Cramm's rule.	K4	CO4
5	20	Critically examine the limitations of Input-Output analysis.	K4	CO5