

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**MA DEGREE EXAMINATION MAY 2022
(Second Semester)**

Branch – ECONOMICS

MATHEMATICAL METHODS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (5 x 1 = 5)

1. Find the determinant of the matrix $A = \begin{bmatrix} 7 & 4 \\ 2 & 1 \end{bmatrix}$
 - (i) 1
 - (ii) -2
 - (iii) -1
 - (iv) 2
2. Price multiplied by the quantity of the commodity is called
 - (i) Total revenue
 - (ii) Average revenue
 - (iii) Marginal revenue
 - (iv) Total Cost
3. The change in 'U' with respect to change in X or Y is called
 - (i) Simple differentiation
 - (ii) Matrix
 - (iii) Partial differentiation
 - (iv) Integration
4. The Statement of equality between two expressions in terms of derivatives of varying quantities is called
 - (i) Partial differentiation
 - (ii) Differential equation
 - (iii) Matrices
 - (iv) Integration
5. $\int 7dx$ equal to
 - (i) $dx=7x+c$
 - (ii) $dx=7x^2+c$
 - (iii) $dx=7x^3$
 - (iv) $dx=7x^4$

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 3 = 15)

6. a. Explain the Limitations of Mathematical Economics.
OR
b. Solve the Simultaneous Equations:

$$\begin{aligned} 3x - 2y &= 5 \\ 5x - y &= 3 \end{aligned}$$
7. a. Solve Derivatives; when $y = x^3 - 6x^2 + 9x + 2$.
OR
b. Discuss the Rules of Differentiation.
8. a. Evaluate: Partial Derivatives if $Z = \frac{5x^2}{5x - y + 4}$.
OR
b. If $z = 3x^2 + xy - 2y^3$ Apply Total Differentiation.
9. a. Marginal Cost is $1 + x + x^2 + x^3$. Prepare the Total Cost.
OR
b. Discuss the General Formula for First Order Linear Differential Equations.

Cont...

10 a State the Rules Integration.

OR

b Evaluate $\int_2^3 (x^2 + 5x + 7)dx$.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

11 a Interpret, $AB \neq BA$ for the following Matrices if $A = \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 2 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & 2 \\ 0 & 0 & 1 \end{bmatrix}$.

OR

b Solve the equations by using Cramer's Rule.

$$x - 2y + 3z = 1$$

$$3x - y - 4z = 3$$

$$2x + y - 2z = -1$$

12 a Solve the Equation by $\frac{U}{V}$ Rule if $y = \frac{8x^2 + 6x^2 - 2x}{3x^2 + 5x}$.

OR

b Asses the Maxima and Minima of the function $y = 2x^3 - 6x^2 + 6x + 5$.

13 a Formulate the Second Order Partial Derivative function: $U = 2x^2 + 4xy + 5y^2$

OR

b Compare the condition of Maxima and Minima using Constrained Extreme Values.

14 a Develop – Cobweb Model.

OR

b Solve the Differential Equation $\frac{dy}{dx} + \frac{y(1+2t)}{t(1+t)} = 0$.

15 a Invent the Area included between the two Parabola: $y^2 = 4x$, $x^2 = 4y$.

OR

b The Demand Function for a commodity $P = 25D + 60$ and the Supply Function $P = 5D + 60$ Asses the Producers and Consumer Surplus.

Z-Z-Z

END