

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BA DEGREE EXAMINATION DECEMBER 2022
(Second Semester)

Branch – ECONOMICS

MATHEMATICAL METHODS - II

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

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

- The process of finding the rate at which a variable quantity is changing, called as _____
(i) Differentiation (ii) Marginal Analysis
(iii) Maximum values (d) Elasticity of demand
- If $y = x^{10}$, $\frac{dy}{dx} = ?$
(i) $9x^{10}$ (ii) $8x^9$
(iii) $10x^9$ (d) $11x^8$
- $\frac{dx}{dy} \cdot dy$, Which is treating as constant?
(i) u (ii) x
(iii) y (d) o
- The reverse process of differentiation is _____
(i) Total utility (ii) Marginal utility
(iii) Integration (d) Consumers' surplus
- Linear Programming is concerned with the determination of the _____
(i) Constraints (ii) Solution
(iii) Optimal Solution (d) Maximum value

SECTION - B (15 Marks)

Answer ALL Questions

ALL questions carry EQUAL marks (5 x 3 = 15)

- (a) State the process of differentiation.
(or)
(b) Find $\frac{dy}{dx}$ for $y = \frac{x^2 + 4}{x + 2}$.
- (a) Find Partial derivatives of $z = 4x^2 + 4xy + y^2$.
(or)
(b) Write about cross Partial Derivatives.
- (a) Bring out the need for Total Differential.
(or)
(b) Find $\frac{dy}{dx}$ of implicit function: $x^2 - xy - 2x + 3 = 0$.
- (a) $\int 4x^3 dx = ?$
(or)
(b) What are the properties of Definite Integrals?
- (a) What are the steps involved in graphical Method of Linear Programming?
(or)
(b) Define: Gam Theory.

Cont...

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 6 = 30)

11. (a) Determine the maxima and Minima of the following function:

$$Y = x^3 + 5x^2 + 8x + 5$$

(or)

- (b) i) If
- $y = 3x^2 (3x + 5)$
- , Find
- $\frac{dy}{dx}$

ii) Find $\frac{dy}{dx}$, $Y = \frac{x^2 + 1}{x^3 + 2x}$

12. (a) Find all the partial derivatives of second order of the function Determine the maxima and Minima of the following function:
- $U = x^3 + 3x^2y + y^3$

(or)

- (b) Compute Marginal Productivities of Labour and Capital at
- $L=2$
- , and
- $K=3$
- for production function
- $U = 2L^2K + 3LK^3 + 6L + 9K$
- .

13. (a) Find the Total differential of
- $Z = (2x^2 + 3y^2)(x^2 - y^2)$

(or)

- (b) Bring out the properties of Cobb-Douglas Production Function.

14. (a) Evaluate
- $\int_2^3 (x^2 + 5x + 7) dx$
- .

(or)

- (b) If the demand function is
- $p = 25 - 3x = 3x^2$
- and the demand
- x_0
- is 2. What will be the Consumer's Surplus?

15. (a) Solve Linear Programming Graphically

Maximize $Z = 45x + 80y$

$5x + 20y \leq 400$

Subject to $10x + 15y \leq 450$

$x \geq 0$ and $y \geq 0$

(or)

- (b) Solve the following Game
- $A = \begin{bmatrix} 1 & 7 & 2 \\ 6 & 2 & 7 \\ 5 & 1 & 6 \end{bmatrix}$

Z-Z-Z

END