

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

**BA DEGREE EXAMINATION MAY 2017
(Fourth Semester)**

Branch- **ECONOMICS**

MATHEMATICAL METHODS - II

Time : Three Hours

Maximum : 75 Marks

SECTION-A (20 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10x2 = 20)

- 1 What do you mean by calculus?
- 2 Define Maxima.
- 3 Find partial derivatives of $u = x + y$.
- 4 Give the meaning of total differentiation.
- 5 Define integral calculus.
- 6 Write the formula for producer's surplus.
- 7 What do you mean by linear programming?
- 8 Define feasible solutions.
- 9 Give the meaning of input-output analysis.
- 10 What is input co-efficient?

SECTION - B (25 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks (5x5=25)

- 11 a Differentiate the following
(i) $y = 3x^2(3x + 5)$ (ii) $y = x^3(3x^2 + 9)$.
OR
b The total cost function is
 $c = jQ^3 + 6Q^2 + 12Q$, find AC and MC.
- 12 a Find all the partial derivatives of second order of the function derivatives.
 $z = 2x^3 + 5xy + xy^2 + y^2$.
OR
b For the total utility function $U = (3x + 7y)(x - 5)$, find marginal utility of x and y at $x = 2$ and $y = 1$.
- 13 a Evaluate $\int 9x^4(x^5 + 7)^8 dx$.
OR
b $\int (x^2 + 5x + 7) dx$.

Cont...

14 a Obtain dual of the following LPP :

$$\text{Maximize } z = 300x + 200y$$

$$\text{Subject to } 5x + 2y < 180$$

$$x + y < 45$$

$$x > 0, y > 0.$$

OR

b Write down the basic steps in mathematical formulation of linear programming problem.

15 a Explain the uses of input-output analysis.

OR

b Discuss the types of input-output model.

SECTION - C (30 Marks)

Answer any THREE Questions

ALL Questions Carry EQUAL Marks (3 x 10 = 30)

16 Given the function $y = x^3 - 3x^2 + 7$, find the point of inflexion. ' .

17 Find the total differential of $z = (2x^2 + 3y^2)(x^2 - y^2)$.

18 The demand function for a commodity $P = 30 - 2D$. the supply function $P = 3D$. Find consumer's surplus.

19 Solve graphically

$$\text{Maximize } z = 45x + 80y$$

$$\text{Subject to } 5x + 2y < 400$$

$$10x + 15y < 450$$

$$x > 0 \text{ and } y > 0.$$

*

20 In an economy of two industries A and B, the data in millions of rupees is given below.

	Buying sector	Final demand	Total output
	A B		
Selling A	18 8	10	36
Sector B	9 24	15	48

Determine the total output, if the final demand changes to 30 for A and 40 for B.

Z-Z-Z

END