14ECU10

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BA DEGREE EXAMINATION MAY 2018
(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 (10 x 2 = 20)

1 Define calculus.

2 State the conditions for profit maximisation.

3 What is partial differentiation?

4 Find the total differential of $u = 4x^2 + 3y^2$.

5 What is consumer's surplus?

6 Evaluate $J4x^8dx$.

7 What is feasible solution?

8 Define constraints.

9 State the meaning of input-output analysis.

10 What is closed input-output model?

SECTION - B (25 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5x5= 25)

11 ai) If $>' - \frac{}{x^2+1}$, find —. dx

ii) If $y = x^4 + x^2 + x$, find the third derivatives of Y.

OR

b Given the total cost function $c = 50 - 2Q + 7Q^2 + Q^3$, find the marginal cost when Q = 5.

12 a Find all the partial derivatives of $z = 12 - x^2 - y^2 + xy$.

OR

b For the total utility function $U = —\frac{x^2 y^2}{x^3+y^3}$ compute marginal utilities of x and y.

13 a Evaluate $J21x^6(x7 + l)^2dx$.

OR

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

Cont...

14 a What are the uses of linear programming?

OR

b Solve the following game:

$$A = \begin{bmatrix} 1 & 7 & 2 \\ 6 & 2 & 7 \\ 5 & 1 & 6 \end{bmatrix}$$

15 a List out the limitations of input-output analysis.

OR

b State the assumptions of input-output analysis.

SECTION - C (30 Marks)

Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

16 Find the maxima and minima of the function .y = x + 5x +8x + 5.

17 Find the elasticity of demand, when the demand function $q = \frac{20}{P + 1}$ and p = 3

18 The demand function for a commodity is p = 10 - 2q. Find the consumer surplus for (i) $p_0 = 0$ (ii) $p_0 = 1$.

19 Solve graphically
Maximise z = 45x + 80y
Subject to 5x + 20y < 400
lOx + 15y <450
x > 0 and y > 0.

20 The input coefficient matrix (A) and final demand vector (D) for an economy with three sectors are given below:

$$A = \begin{vmatrix} '0.3 & 0.4 & 0.2' \\ 0.2 & 0.0 & 0.5 \\ 0.1 & 0.3 & 0.! \end{vmatrix}, \quad D = \begin{vmatrix} '100' \\ 40 \\ 50 \end{vmatrix}$$

Calculate the output level for the three sectors.

Z-Z-Z END