PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BA DEGREE EXAMINATION DECEMBER 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 (10 x 2 = 20)

1   What is marginal revenue?

2   State the second order condition for minimization and maximization.

3   If $z = 2x^3y^2$, find $\partial z/\partial x$ & $\partial z/\partial y$.

4   If $z = 3x^3y$, find $\partial^2 z/\partial x^2$.

5   What is integration?

6   What is producer's surplus?

7   What is meant by Liner programming ?

8   State the meaning of saddle point.

9   State any two assumptions of input output analysis.

10   State any two limitations of input output analysis.

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

11 a   If $y = \sqrt{4x^4} + 25x^3 - x + 50$ find dy/dx.
                                  OR
    b   If total cost of a firm is $C = 15x^3 - 8e^x + 5\log x$, then find average cost and marginal cost.

12 a   If $u = 3x^2 + 5xy^2 - 2y$, prove that $\partial^2 u/\partial x \partial y = \partial^2 u/\partial y \partial x$.
                                  OR
    b   If the production function of a firm is $Q = 8LK - L^2 - K^2$, show that $L.\partial Q/\partial L + K.\partial Q/\partial K = 2Q$.

13 a   Evaluate : $\int 1/x + 3x^2 + e^x dx$.
                                  OR
    b   If the demand function $p = 45 - 2x - x^2$ and the demand x_0 is 4, what will be the consumer's surplus.

14 a   Explain the assumptions of Linear programming.
                                  OR
    b   Write a short note on simplex method.

15 a   List out the importance of input output analysis.
                                  OR
    b   Explain the assumptions and limitations of input output analysis.

SECTION - C (30 Marks)
Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks $(3 \times 10 = 30)$

16 Given the demand function $x^2 = 12-p$ and cost function $C = -4/3x^3+4x^2+10$, where p denotes price, x number of units of output and c is the total cost. Find the output when profit is maximum.

17 In a duopoly market, demand and cost functions are given as $p = 150-0.4Q1+0.4Q2$, $C_1 = 8Q_1$; $C_2 = 0.4Q_2^2$.Find output Q1, Q2 and Profit of both the seller.

18 Marginal cost of a firm is $100-10x0.1x^2$, Where x is the output. What is the total cost function and average cost function if the fixed cost is Rs.500. Also find the output when marginal cost is minimum.

19 Explain the uses of linear programming.

20 There are two industries A and B in an economy. The following table gives the supply and demand position of these industries in million Rupees.

Industry	A	B	Final Demand	Total Output
A	30	20	20	70
B	40	60	30	130

Determine the total output if the final demand changes to 24 for industry A and 36 for B.

Z-Z-Z   END