Register Number:

Date:

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE-27
B.A. ECONOMICS –V SEMESTER
SEMESTER EXAMINATION: OCTOBER 2019
ECADE 5318 – MATHEMATICAL METHODS FOR ECONOMICS

Time- 2 1/2 hrs **Max Marks-70**

This paper contains two printed pages and three parts

Part A

I. Answer any 10 of the following. **[10 x 3 =30]**

1. Find the value of Rs. 5000 at 10 percent interest for two years, compounded annually.

2. When price of a commodity was Rs. 10, the demand was 6 units and when price reduced to Rs. 9 the demand increased to 9 units. Obtain the linear demand function.

3. If $Y = X^3$, Find $\frac{Ey}{Ex}$, The elasticity of Y with respect to X.

4.Given AC =100Q +10 Find TC when Q=10.

5. Find equilibrium price and quantity given D = 50 -2P and S = 20 + 8P.

6. Obtain $MP_K$and AP_Kif the production function is $Q = 40K^2 + 20K - 10$ and K = 10.

7. Calculate MU of x and MU of y given the utility function $U = 10x^3y^2 + 2x^2y + y^2 - 5$ when x = 5 and y = 10.

8. If AR is 50 and MR = 10, find elasticity of demand.

9. If P = 10 – 2Q find consumer's surplus if Q = 2.

10. Find the maxima or minima of the function $Y = X^2 - 4X - 5$.

11. If MR = 200 - 2Q find the TR function. What is the TR if Q = 10?

12. Find the determinant of the following matrix $\begin{vmatrix} 9 & 4 & 3 \\ 7 & 5 & 8 \\ 6 & 2 & 4 \end{vmatrix}$

PART B

II. Answer any two of the following. **[2 x 5 =10]**

13. Use Cramer's rule to solve the system of equations

$$3x_1 - 4x_2 = 13$$
$$2x_1 - 3x_2 = 3$$

14. Derive the relationship between AC and MC.

15. If $Q = AL^{3/4} K^{3/4}$ is there exact adding up if the factors are paid according to their marginal productivity? Interpret the result.

PART C

III. Answer any two of the following. **[2 x 15 = 30]**

16.Given the demand function of a monopolist P = 68 – 6Q and the cost function C = $2q^2$ – 2q + 5, find equilibrium profit, equilibrium price, equilibrium quantity, TR and TC.

17.Find the consumer surplus and producer's surplus for the following demand and supply functions. demand function P = 8 – 2X and Supply function is P = 2 + X

18.Find the equilibrium solution of price, QD, QS for the following general market equilibrium of $\mathbf{QS_1 = -2 = 4P_1}$ and $\mathbf{qd_1 = 18 - 3p_1 + p_2}$. &$\mathbf{QS_2 = -2 + 3P_2}$ and $\mathbf{QD_2 = 12 + P1 – 2P_2}$. By crammers rule.