Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SET A

SCHOOL OF COMMERCE
END TERM EXAMINATION - JAN 2024

Semester : Semester I - 2023
Course Code : BSC2050
Course Name : Basic Mathematics for Economics
Program : B.Sc. Economics

Date : 11-JAN-2024
Time : 1:00 PM - 4:00 PM
Max Marks : 100
Weightage : 50%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **5 X 2M = 10M**

1. Differentiate static, comparative and dyanmic analysis in economics

(CO2,CO1) [Knowledge]

2. List out the common rules of integration

(CO2,CO1) [Knowledge]

3. Solve $Log_a X + Log_a(X+2) = Log_a 24$

(CO3) [Knowledge]

4. 1. Simplify
   1. $5(7X^2 - X - 3) + (3X^2 + 6X)$
   2. (6X+2Y) (7X-8Y) + 4X + 2Y

(CO4) [Knowledge]

5. The production process in a firm is 0.55 of a labour hour, 0.35 of machine hour and 0.15 of managerial hour per one unit of product X. Per hour remuneration for labour is Rs. 200, and that for a machine is Rs.300 and that for a managerial hour is Rs. 600. Find the cost function of the firm in linear form and compute the cost of producing 500 units of the product X.

(CO5) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **5 X 10M = 50M**

6. 1. Evaluate the following
   1. $\int_1^3 (4X^2 - 2)(8X)dx$
   2. $\int_1^5 6X^4 dx$
   3. $\int \frac{1}{X^4} dx$
   4. $\int 2X(X^2 + 1)dx$

(CO1,CO2) [Comprehension]

7. A firm operates with a production process that uses 0.75 of a labour hour, 0.25 of machine hour and 0.005 of managerial hour per one unit of product X. Per hour remuneration for labour is Rs. 100, and that for a machine is Rs.200 and that for a managerial hour is Rs. 500. Express the cost function of the firm in linear form and compute the cost of producing 1000 units of the product X

(CO3) [Comprehension]

8. 1. Find the curvature of the function

1. $X^3 - 3X^2 + 2$
2. $4X^2 - 4X + 8$

(CO3) [Comprehension]

9. 1. Find relative extremum value of the function using second order derivative test

$$Y = f(x) = X^3 - 12X^2 + 36X + 8$$

(CO4) [Comprehension]

10. .

1. Determine the rank of the matrix

$$\begin{matrix} 2 & 1 & -3 & -6 \\ 3 & -3 & 1 & 2 \\ 1 & 1 & 1 & 2 \end{matrix}$$

(CO5) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS **2 X 20M = 40M**

11. Find the equilibrium price and quantity of the two-commodity market model

$Q_{d1} = 18 - 3P_1 + P_2$
$Q_{s1} = (-2) + 4P_1$
$Q_{d2} = 12 + P_1 - 2P_2$
$Q_{s2} = (-2) + 3P_2$
$Q_{di} = Q_{si}$

(CO4,CO3) [Application]

12. Solve the equations using Cramer's' rule

$$\begin{aligned} 7x_1 - x_2 - x_3 &= 0 \\ 10x_1 - 2x_2 + x_3 &= 8 \\ 6x_1 + 3x_2 - 2x_3 &= 7 \end{aligned}$$

(CO5) [Application]