Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF COMMERCE
END TERM EXAMINATION - JUN 2023

Semester : Semester II - 2022
Course Code : BSE1003
Course Name : Sem II - BSE1003 - Advanced Mathematics for Economics
Program : BSE

Date : 19-JUN-2023
Time : 1.00PM - 4.00PM
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 **(10 X 2 = 20M)**

1. What is the full form of CES production function?

(CO2) [Knowledge]

2. If two demand curves originate from a single point on the Y-axis, then their elasticity is the same. (True or False).

(CO3) [Comprehension]

3. Write down the equation of the CES production function.

(CO3) [Comprehension]

4. Differentiate the following function:
y = a^x

(CO2) [Knowledge]

5. Walrasian system works through _____ movements and the Marshallian system works through _____ movements.

(CO3) [Comprehension]

6. Write down the two conditions of the firm's equilibrium.

(CO4) [Knowledge]

7. Transpose the following matrix A (1x4):
A = [1 3 4 6]

(CO1,CO2) [Knowledge]

8. If the value of MR is 0, then what will be the value of the elasticity of demand?

(CO4) [Comprehension]

9. Mention the name of the economists who proposed the CES production function.

(CO4) [Comprehension]

10. Integrate the following function:
y = ∫e^x dx

(CO3) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **(4 X 10 = 40M)**

11. Find the inverse of the matrix

$$A = \begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 2 & 9 \end{matrix}$$

(CO4) [Comprehension]

12. If the demand function is: x = 25 -4p + p^2; where x is the demand function for commodity at price p. Find elasticity of demand with respect to price at the point where (i) P = 8; (ii) P = 4; (iii) P = 5.

(CO3) [Comprehension]

13. a.Explain why the short-run average cost curve is U-shaped by using a labelled diagram.
b.Draw the shape of the marginal revenue curve when the average revenue curve is - first, a straight line and a downward sloping curve, second, a downward sloping and convex to the origin and third, a downward sloping and concave to the origin.

(CO2) [Comprehension]

14. Derive the relationship between marginal revenue and the price elasticity of demand mathematically.

(CO3) [Comprehension]

PART C

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

15. a.What is linear programming?
b.Maximize Z = 2x + 5y.
The constraints are $x + 4y \leq 24$, $3x + y \leq 21$ and $x + y \leq 9$; where, $x \geq 0$ and $y \geq 0$.
Using a graphical method of linear programming, calculate the values of x and y at which Z is at its maximum.

(CO3) [Comprehension]

16. Consider the following equation:
Q = A (L^a) (K^b)

- Identify this production function.
- Derive Marginal Product of Labour and Capital
- Derive Marginal Rate of Technical Substitution
- Derive Elasticity of Substitution
- Derive Factor Intensity

(CO4) [Application]