REV-01
BEC/02/05

2025/12

SET A

BA ECONOMICS
FIRST SEMESTER [REPEAT]
MATHEMATICAL METHODS FOR ECONOMICS - I
BEC – 103
[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

Objective

Time: 30 mins. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. If $y= X^n$ $dy/dx=$
   a. nx b. X^{n-1}
   c. nx^{n-1} d. $(n-1)x^n$

2. If $Y= C$, $dy/dx=$
   a. 10 b. C
   c. 0 d. $1/X$

3. If $Y=1/X$, $dy/dx=$
   a. $-1/x^2$ b. 1
   c. X^2 d. 0

4. If $Y=e^x$, $dy/dx=$
   a. xe b. Xe^{-1}
   c. e^x d. e^{-x}

5. What is derivative of ax^n?
   a. n b. $2nx^{n-a}$
   c. anx^{n-1} d. nx^{a-1}

6. Given a consumption function C = 250 + 0.75Yd, autonomous consumption is
   a. 0.75 b. 250
   c. 0 d. -0.75

7. Given a saving function S = 100 + 0.8Y, MPC is.....
   a. 100 b. −100
   c. 0.2 d. 0.8

8. The given function $f(x) = ax^2 + bx + c$, is an example of function:
   a. quadratic b. polynomial
   c. linear d. rational

9. .....function expresses the relationship between price of the good and quantity of the good demanded.
   a. Demand
   b. Consumption
   c. Supply
   d. Income

10. .....function expresses the relationship between price of the good and quantity of the good supplied.
   a. Consumption
   b. Supply
   c. Demand
   d. Income

11. Given the consumption function C = a + bY, the slope 'b' represents
   a. MPS
   b. autonomous consumption
   c. MPC
   d. Saving

12. When total cost in a production is given by C = 4x + 500 then fixed cost is.....
   a. 0
   b. 500
   c. 504
   d. 4

13. Given the total cost function TC = $1.5Q^2 + 4Q + 46$, marginal cost is.....
   a. $3Q + 4$
   b. $1.5Q^2 + 4Q$
   c. $1.5Q + 4 + 46/Q$
   d. $1.5Q^2 + 46$

14. When the total revenue functions is $R = 100 - X^2$, the marginal revenue is.....
   a. $100 - 2X$
   b. $-X^2$
   c. $-2X$
   d. 100

15. If $u = x^n$ is total utility, the functions of marginal utility u will be:
   a. x^{n+1}
   b. nx^{n-1}
   c. nx^{n+1}
   d. $n^{x+1}x$

16. When elasticity of demand is 2, the demand will be.....
   a. Unit elastic
   b. Relatively elastic
   c. Perfectly inelastic
   d. Perfectly elastic

17. Games which involve more than two players are called.....
   a. conflicting games
   b. negotiable games
   c. N-person games
   d. All of these

18. The founder of the Game theory is.....
   a. Adam smith
   b. Alfred Marshall
   c. John von Neumann
   d. John Keats

19. The "Father of Linear Programming" is.....
   a. Amartya Sen
   b. George B. Dantzig
   c. Stephen Hawkins
   d. John von Neumann

20. Which set is the subsets of all given sets? 1. 2. 3. 4.

a. {1}
b. {0}
c. {0,1,6.7}
d. θ

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Descriptive

Time : 2 Hr. 30 Mins. **Marks : 50**

[Answer question no.1 & any four (4) from the rest]

1. What is a function? Explain the different types of functions. 10

2. Given $A=\begin{bmatrix}2 & 1\\ 4 & 2\end{bmatrix}$, B=3015 and $C=\begin{bmatrix}1 & 2\\ 2 & 3\end{bmatrix}$ 10
   Show that, $(A+B+C)'= A'+B'+C'$

3. Show that $(ABC)'=C'B'A'$ if $A=\begin{bmatrix}0 & 1\\ 4 & 2\end{bmatrix}$, B=30135 and $C=\begin{bmatrix}10 & 2\\ 2 & 3\end{bmatrix}$ 10

4. Evaluate the following inverse of the matrix: 10

   5-12301423

5. What is a determinant? Explain the properties of a determinant. 10

6. Define the followings: 2×5=10
   a) Proper subset
   b) De Morgan's law
   c) Difference of sets
   d) Complement of set
   e) Disjoint set

7. If A = {1,2,3,4,5} and Set B = {3,4,6,8}, Find and display the followings in set operations: 10
   a) $A \cap B$
   b) $A \cup B$
   c) $A \cup B'$
   d) $A' \cap B$
   e) $A' \cap B'$

8. Define the followings: 10
   a) Square matrix
   b) Identity matrix
   c) Scalar matrix
   d) Transpose of the matrix
   e) Null matrix

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