2026

ECONOMICS

(Major)

Anandaram Dhekial Phookan College Library
Acc. No.
Date
Nagaon : Assam

Paper : ECO4200204MJ

(Introductory Quantitative Techniques for Economics)

Full Marks : 60

Time : 2½ hours

The figures in the margin indicate full marks for the questions.

1. **Answer to the following questions :** **1×8=8**

   a. What is rational number?

   b. The numbers that have only two factors are called_____ numbers.

   c. What do you mean by variable?

   d. Compare the integers –3 and –7 using a number line.

   e. In the equation $y = 5x + 3$, identify the constant and variable.

   f. What is a universal set?

   g. Is the Cartesian product of two sets commutative? Why or why not?

   h. How is an ordered pair different from a set?

2. **Answer any six of the following questions :** **2×6=12**

   a. Find the Cartesian product of $A = \{1,2\}$ and $B = \{3,4,5\}$.

   b. What is range? State the range of the relation $R = \{(1, 4), (2, 5), (3, 6)\}$.

   c. Define a natural number and whole number. Give one example of each.

   d. What is the power of a set, If $A = \{a, b, c, d\}$.

   e. Find the equation of a straight line whose slope is 5 and which passes through the point (2, 3).

   f. What is the inverse relation of $R = \{(-1, 4), (0, 5), (3, 6)\}$?

   g. Find the limit of $f(x)=2x^2 + 5$ when x approaches 3.

   h. Define continuity of a function and evaluate $\lim_{x \to 18} \sqrt{2}$.

   i. $Y = u^2 + 2u + 3$, $u = v^2 - 1$, $v = 6x + 1$ under this equation, find dy/dx by using chain rule.

   j. Differentiate $e^{x(1+\log x)}$ w.r.t. x.

3. **Answer any four of the following questions :** **5×4=20**

a. Give difference between constants and variables.

b. What is the difference between the union and the intersection of two sets. If $A = \{1,2,3\}$ and $B = \{3, 4, 5\}$, calculate A union B and A intersection B.

c. In a class of 40 students, 28 enjoy painting, and 20 enjoy dancing. Each student enjoys at least one of two activities. How many students enjoy both painting and dancing?

d. Evaluate $\int (4x + 3)(\sqrt{2x + 1})\, dx$.

e. Find the area of the curve $y = 2x^2 + 3x$ from $x = 0$ to $x = 2$.

f. If the demand function is : $P = 30 - 2x - x^2$ and the demand is 3, what will be the consumer surplus (CS)?

g. What are the key assumptions of simple linear regression?

h. State the main differences between regression and correlation.

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4. **Answer any two of the following questions.** **10×2=20**

a. What is the standard form of a rational number? Find a rational number between the following rational numbers :

(i) $\frac{3}{1}$ and $\frac{5}{4}$ ii) 2 and 3 iii) $\frac{8}{7}$ and $\frac{4}{3}$

b. Given $A = \{2, 4, 6, 8\}$, $B = \{4, 8, 12, 16\}$ and $C = \{6, 8, 10, 12\}$ find $A \cup B$, $A \cap C$, $B - A$, $(A \cup B) \cap C$, $(A \cap B) \cup (B \cap C)$.

c. What does it mean for two sets to be equal in the context of Cartesian products? Let $A = \{1, 2, 3\}$ and $B = \{a, b\}$. Find $A \times B$ and $B \times A$. Compare the results of $A \times B$ and $B \times A$.

d. A firm has the following TC and demand functions $C = \frac{1}{3}x^3 - 7 - x^2 + 111x + 50$ and $x = 100 - p$. Find profit maximising level of output x and also maximum profit.

e. From the following total cost function, find the value of x where average variable cost is minimum $TC = 2x^3 - 300x^2 + 600x + 900$.

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