

FOURTH SEMESTER B.A. DEGREE EXAMINATION, APRIL 2019

(CUCBCSS—UG)

Economics

ECO 4B 05—QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS—II

Time : Three Hours

Maximum : 80 Marks

*Use of Calculator is permitted.***Part A***Answer all questions.*

1. $\lim_{x \rightarrow 2} \frac{x^2 - 5x + 6}{x - 2}$, is _____.
(i) - 1. (ii) 0.
(iii) 1. (iv) 2.
2. The derivative of $\log x$ with respect to x is _____.
(i) 1. (ii) x .
(iii) $1/x$. (iv) 0.
3. If the cost per output is $k = 3x + 18$, then marginal cost when $x = 3$ is _____.
(i) 3. (ii) 9.
(iii) 27. (iv) 18.
4. The derivative of $y = 1/x$ with respect to x is _____.
(i) x . (ii) $-x$.
(iii) $-x^2$. (iv) $-x^{-2}$.
5. When $TR = 100 - x^2$, the MR is _____.
(i) 100. (ii) $-2x$.
(iii) $-x^2$. (iv) None of these.

Turn over

6. If Laspayer's and Paasche's index numbers are calculated as 120 and 124. Then Fisher's index number is :
- (i) 122. (ii) 121.98.
(iii) 123. (iv) None of these.
7. The AM of Laspayer's and Paasche's index numbers is _____ index number.
- (i) Fisher's. (ii) Kelley's.
(iii) Dorbish-Bowley. (iv) Marshal Edgeworth.
8. For an index number satisfying time reversal test $p_{01} \times p_{10} =$ _____.
- (i) 0 (ii) 1.
(iii) 100. (iv) None of these.
9. Number of female children born to 1000 females is _____.
- (i) 1000 TFR. (ii) 1000 NRR.
(iii) 1000 GRR. (iv) 1000 SFR.
10. Two unbiased coins are tossed. P (getting tails on both of the coins) = _____.
- (i) 0.25. (ii) 0.50.
(iii) 0.75. (iv) 1.
11. $P(A) = 0.5$, $P(B) = 0.4$, if A and B are independent, $P(A/B) =$ _____.
- (i) 0.2. (ii) 0.02.
(iii) 0.5. (iv) 0.4.
12. If A and B are mutually exclusive, $P(A \cap B) =$ _____.
- (i) $P(A)$. (ii) $P(A)P(B)$.
(iii) $P(B)$. (iv) None of these.

(12 × ½ = 6 marks)

Part B (Short Answer Type)*Answer any ten questions.**Each one carries 2 marks.*

13. Find the derivative of $\frac{x^2 - 1}{x^2 + 1}$ with respect to x .
14. If $y = 3x^3 + 2x$, find $\frac{d^2 y}{dx^2}$.
15. Define marginal productivity.
16. Find the marginal cost if the total cost is $1000 + 100x - 10x^2 + x^3$.
17. Total revenue function of a firm is $R = 21x - x^2$. Find the marginal revenue when 10 units are sold.
18. Define elasticity.
19. Define splicing.
20. Define fixed base index number.
21. Define Kelley's index number.
22. Define Crude death rate.
23. $P(A) = 0.5$, $P(B) = 0.4$, $P(A \cup B) = 0.7$. Verify whether A and B are independent.
24. State addition and multiplication theorem of probability of two events A and B.

(10 × 2 = 20 marks)**Part C (Short Essay Questions)***Answer any six questions.**Each one carries 5 marks.*

25. If $y = e^x (1 + x)$, show that $\frac{d^2 y}{dx^2} = e^x + \frac{dy}{dx}$.
26. The cost function $c = a + bx + cx^2$. Obtain marginal cost and average cost functions. **Turn over**

27. Explain GRR and NRR.
28. Explain price and quantity index numbers.
29. Write a note on cost of living index number.
30. Explain age specific fertility rate and total fertility rate.
31. Define random experiment. Write down the sample space of the random experiment of tossing of two unbiased dice.
32. Given $P(A) = 0.6$, $P(B) = 0.4$, $P(A \cap B) = 0.3$. Find (i) $P(A \cup B)$; (ii) $P(A^c/B)$; (iii) $P(A^c/B^c)$.

(6 × 5 = 30 marks)

Part D (Essay Questions)*Answer any two questions.**Each one carries 12 marks.*

33. The total revenue function for x outputs is given by $R = 3000 - (3 - x)^2$ find the value of x for which R is maximum and the maximum value of R .
34. Calculate (i) Fisher's index number ; (ii) Marshal Edgeworth index number using the following data :

Commodity	2004		2008	
	Price (p_0)	Quantity (q_0)	Price (p_1)	Quantity (q_1)
A	2	8	4	6
B	5	10	6	5
C	4	14	5	10
D	2	19	2	13

35. Three unbiased coins are tossed. Write the sample space. Find (i) P (getting at least two heads) ; (ii) P (getting at most one head) ; (iii) P (getting exactly two heads) ; (iv) P (getting at least one tail) ; and (v) P (getting all coins of same side).
36. Two boxes contains respectively 2 red, 3 black balls and 3 blue balls; 4 red, 4 black and 2 blue balls. One of the boxes is selected randomly and two balls are drawn. They happened to be 'one red and one blue'. What is the probability that they come from the second box ?

(2 × 12 = 24 marks)