C 41031 (Pages : 4) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2023

Economics

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

(2017—2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Use of calculator is permitted.

Part A

Answer **all** *questions.*
Each question carries ½ mark.

1. Find the derivative $\log x$:

   (a) $\log x$. (b) $\frac{1}{x}$.

   (c) x^2. (d) None of these.

2. Find $\lim_{x \to 1} \frac{x^2 - 1}{x - 1}$:

   (a) 1. (b) 3.

   (c) 2. (d) 4.

3. It is the rate at which the consumer is prepared to exchange one commodity for another marginal rate of substitution of x for y :

   (a) MRS. (b) MRPT.

   (c) MRTS. (d) None of these.

4. It measures the percent change in quantity purchased of x_1 due to one percent change in the price of related good, keeping the own price and consumer's income constant :

   (a) Cross elasticity. (b) Price elasticity.

   (c) Output elasticity. (d) Income elasticity.

Turn over

5. The price index as the arithmetic mean of Laspeyre's and Paasche's indices was expounded by:

(a) Irving Fisher. (b) Drobish and Bowley.

(c) Walsh. (d) Kelley.

6. Combing of two index number series having different base periods into one series with common base period is known as :

(a) Base shifting. (b) Splicing.

(c) Both (a) and (b). (d) None of these.

7. Method of least squares to fit in the trend is applicable only if the trend is :

(a) Linear. (b) Parabolic.

(c) Both (a) and (b). (d) Neither (a) nor (b).

8. Moving average method of fitting trend in a time series data removes the effect of :

(a) Short term movements. (b) Long term movements.

(c) Cyclic variations. (d) None of these.

9. Vital statistics is mainly concerned with :

(a) Marriages. (b) Deaths.

(c) Births. (d) All the above.

10. The death rate of women due to delivery of children is termed as :

(a) Maternal mortality rate. (b) Neonatal mortality rate.

(c) Neonatal mortality rate. (d) Infant mortality rate.

11. What is the chance of getting a head when a coin is tossed :

(a) $\frac{1}{4}$. (b) $\frac{3}{4}$.

(c) $\frac{1}{3}$. (d) $\frac{1}{2}$.

12. Probability of an event A given that B has happened is called :

(a) Relative probability. (b) Conditional probability.

(c) Axiomatic probability. (d) None of these.

(12 × ½ = 6 mark

Part B (Short Answer Type Questions)

Answer any **ten** *questions.*
Each one carries 2 marks.

13. Define price elasticity of demand.

14. The cost function is defined $x = a + bq + cq^2$, where a, b, c are constants, find AC and MC.

15. Find the total differential of $y = 6x^2 + 8z^2 - 0.3xz$.

16. Prove that Marginal cost must equal marginal revenue at the profit maximizing level of output.

17. Define Marginal Productivity of capital and labour.

18. Define Infant Mortality rate.

19. Define Sex ratio.

20. Mention the two important uses of Index numbers.

21. What is Time reversal test ?

22. A card is drawn from a pack of card. What is the probability that it is (i) a king or a Queen (ii) a king or a Spade.

(10 × 2 = 20 marks)

Part C (Short Essay Questions)

Answer any **six** *questions.*
Each one carries 5 marks.

23. Given the demand function $12q + 7p = 216$, find price elasticity of demand at $p = 20$.

24. Find f_1 and f_2 given $y = f(x_1, x_2) = x_1^3 + 2x_1x_2^2 + 3x_2^2$.

25. Briefly explain the various applications of derivatives in Economics.

26. Write a short note on Returns to Scale.

27. A box contains 3 silver coins and 4 copper coins. A second box contains 5 copper coins and 4 silver coins. One of the boxes is selected at random and a coin is selected from it. What is the probability that it is a silver coin ?

28. Briefly explain Bayes' Theorem of Probability.

Turn over

29. Compute Consumer Price Index number for the following data :

Commodity	Quantity	Base year Price	Current year Price
A	7	80	90
B	9	90	100
C	10	100	80
D	6	40	50

30. Explain important measurement of Mortality.

31. Describe briefly the various methods of determining trend in a time series.

32. Define Index numbers and explain their characteristics and limitations.

(6 × 5 = 30 marks)

Part D (Essay Questions)

Answer any **two** *questions.*
Each one carries 12 *marks*

33. Briefly explain the four components of Time series analysis.

34. Calculate Crude death rate and Crude birth rate for the following data :

Age group (Years)	Population	Live births	Deaths
0–20	10000	40	220
20–30	11000	300	140
30–50	7000	850	110
50 and above	1000	10	90
Total	29000	1200	560

35. Find the first, second and cross partial derivatives for $z = 7x^3 + 9xy + 2y^5$.

36. A bag contains 4 white and 6 black balls. Two balls are drawn one after another with replacement, (i) What is the probability that both are white ; and (ii) Find the probability if the first ball is not replaced before the second drawn.

(2 × 12 = 24 marks)