D 140914 **(Pages : 2)** **Name.....**

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2026

Economics

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

(2019 Syllabus)

Time : Two Hours and a Half Maximum : 80 Marks

Section A (Short Answer Questions)

Maximum marks in this Section is 25.
Students can attempt **all** *questions.*
Each question carries a maximum of 2 *marks.*

1. Factor reversal test.
2. Priori probability.
3. Gross reproduction rate.
4. Optimization.
5. Subjective probability.
6. Mutually exclusive events.
7. Bernoulli trials.
8. Time series analysis.
9. Couple protection ratio.
10. Splicing and deflating.
11. Differentiate log X with respect to X^2.
12. Infant mortality rate.
13. Method of least squares.
14. Limit and continuity of a function.
15. Logarithmic function.

Turn over

Section B (Short Essay/Paragraph Questions)

Maximum marks in this Section is 35.
Students can attempt **all** *questions.*
Each question carries a maximum of 5 *marks.*

16. Prepare a note on stock price indices.

17. What do you know about probability ? Assume the probability that A solves the problem is 0.5, and the probability that B solves is 0.4. What is the probability that the problem is solved by at least one of them ?

18. What are the components of time series analysis ?

19. What do you mean by independence of events ? If A and B are two mutually exclusive events and P (A) = 0.45 and P (B) = 0.35, find P (A or B).

20. Explain the uses of index numbers.

21. Differentiate between maxima and minima of functions using suitable example.

22. Explain the rules of differentiation.

23. Find the first and second order derivatives of the function $Z = 12 - X^2 - Y^2 + XY$.

Section C (Long Essay Questions)

Answer any **two** *questions.*
Each question carries a maximum of 10 *marks.*

24. What do you mean by derivative of single variable and derivative of a multivariable function ? Evaluate economic application of derivatives.

25. What do you mean by Classical Probability ? Consider, the probability that A solves a problem in statistics is 2/5 and the probability that B solves it is 3/8. If they try independently find the probability that (i) both solve the problem (ii) none solve the problem (iii) atleast one solve the problem.

26. Differentiate between unweighted and weighted index numbers. What are the important weighted index numbers ?

27. Explain the meaning and uses of Vital Statistics. Examine the differences between important fertility rates.

(2 × 10 = 20 marks)

D 120643 **(Pages : 3)** **Name.....**

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2025

Economics

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

(2019—2023 Admissions)

Time : Two Hours and a Half Maximum : 80 Marks

Section A (Short Answer Questions)

Maximum marks in this Section is 25.
Students can attempt **all** *questions.*
Each question carries a maximum of 2 *marks.*

1. Optimization.
2. Weighted index numbers.
3. Partial differentiation.
4. Splicing.
5. Marginal productivity.
6. Factor reversal test.
7. Fertility rate.
8. Logarithmic function.
9. NIFTY.
10. Given the production function $q = 10a - a^2 + ab$, determine the marginal productivity with respect to a.
11. Price elasticity of demand.
12. Crude death rate.
13. Random experiment.
14. Wholesale Price Index.
15. Bernoulli trials.

Turn over

Section B (Short Essay/Paragraph Questions)

Maximum marks in this Section is 35.
Students can attempt **all** *questions.*
Each question carries a maximum of 5 *marks.*

16. Explain probability. Assume that a bag contains 3 red balls and 4 black balls. A ball is drawn at random from the bag. Find the probability that the ball drawn is (i) black ; and (ii) not black.

17. Explain the uses of index numbers.

18. Explain Classical Probability. Point out properties of probability.

19. Distinguish between crude birth rate and crude death rate. Assume that the mid-year population of a city in an year was 4,80,500. If there were 10420 births and 6120 deaths in the year in the city. Compute the Crude Birth Rate and Crude Death Rate.

20. Differentiate Laspeyre's from Paasche's index number.

21. Explain the method of least squares. How do you calculate least squares ?

22. Describe the meaning and components of time series analysis.

23. What are the steps in constructing index numbers ?

Section C (Long Essay Questions)

Answer any **two** *questions.*
Each question carries a maximum of 10 *marks.*

24. Explain important rules of differentiation.

    Differentiate :

    i) $X^2 - 1/X^2 + 1$ with respect to $X - 1/X + 1$

    ii) $X^{\log X}$.

25. Explain meaning and important types of vital statistics

26. Calculate Fisher's index numbers from the following data and show that it satisfies both the time reversal and factor reversal tests :

	2010		2020	
Item	Price	Quantity	Price	Quantity
A	12	100	20	120
B	4	200	4	240
C	8	120	12	150
D	20	60	24	50

27. Differentiate between mutually exclusive and collectively exhaustive events ? Explain Priori Classical probability.

(2 × 10 = 20 marks)

D 103127 **(Pages : 3)** **Name.....**

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2024

Economics

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

(2019 Admission onwards)

Time : Two Hours and a Half Maximum : 80 Marks

Section A (Short Answer Questions)

Maximum marks in this Section is 25.
Students can attempt **all** *questions.*
Each question carries a maximum of 2 *marks.*

1. Evaluate the limit of the function

$$\lim_{x \to 4} \frac{x^2 - 4^2}{x - 6}.$$

2. Determine the maxima and minima values of $x^3 - 6x^2 + 9x - 5$.
3. What is Laspeyre's index number ?
4. A box contains 2 white socks and 2 blue socks. Two socks are drawn at random. Find the probability '*p*' they are match (same colour).
5. What is a mutually exclusive event ?
6. Distinguish between BSE-SENSEX and NSE-NIFTY.
7. Define Maternal Mortality rate.
8. Explain the term :
   (i) Equally like events ; and
   (ii) Exhaustive events.
9. A die is thrown. Find the probability of getting (i) A '4' ; (ii) An even number ; (iii) Less than 3 ; and (iv) '3' or '5'.
10. Explain the Subjective approach to Probability.

Turn over

11. What do you meant by Irregular variations ?

12. Name different types of fertility rates.

13. Explain the term (i) Sample space ; and (ii) Sample point.

14. What are the uses of Wholesale price index numbers ?

15. The demand for a particular commodity is $x = 39 - 2p$. Find the equation to the Total revenue curve.

Section B (Short Essay Questions)

Maximum marks in this Section is 35.
Students can attempt **all** *questions.*
Each question carries a maximum of 5 *marks.*

16. Find the Elasticity of demand with respect to price for the demand function

$$D = \frac{8}{P^{3/2}}$$

17. One card is drawn from a standard pack of 52. What is the probability that is either a king or a queen ?

18. What are the important components of Time series ?

19. Revenue function of a firm is given by $R = 14x - x^2$. and the cost function by $T = x\left(x^2 - 2\right)$. Find AC, MC, MR and equilibrium position.

20. Explain the concept of base shifting, splicing and deflating.

21. Calculate index number for 2019 on the base prices for 2015 from the following by average of price relative method :

Items	Bricks	Timber	Plasterboard	Sand	Cement
Price in Rs. (2015)	10	20	5	2	7
Price in Rs. (2019)	16	21	6	3	14

22. What are the important measurements of Mortality ?

23. Define Probability. Briefly explain the concept of (i) Random experiments ; (ii) Mutually exclusive events ; (iii) Exhaustive events ; (iv) Equally likely events ; and (v) Independent events.

Section C (Long Essay Questions)

Answer any **two** *questions.*
Each question carries a maximum of 10 *marks.*

24. (i) Differentiate $y = \frac{(x+1)(2x+1)}{(x-3)}$.

(ii) Differentiate $x^5 + e^x$.

25. Briefly explain different types of Probability.

26. Calculate Fisher's ideal index number from the following data :

Commodity	2017		2018	
	Price	Quantity	Price	Quantity
A	14	32	12	52
B	24	37	11	33
C	17	21	8	44
D	12	27	10	37

27. What do you meant by Vital Statistics ? Point out the important uses of Vital Statistics.

(2 × 10 = 20 marks)

C 41291 **(Pages : 3)** **Name.....**

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2023

Economics

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

(2019 Admission onwards)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Short Answer Questions. Maximum marks in this section is 25.
Students can attempt **all** *questions. Each question carries a maximum of* 2 *marks.*

1. SENSEX.
2. Price elasticity of demand.
3. Optimization.
4. Moving average method.
5. Unweighted and weighted index numbers.
6. Splicing of index numbers.
7. Time series data.
8. Sample space.
9. Base year.
10. Crude birth rate.
11. Gross reproduction rate and net reproduction rate.
12. Subjective probability.
13. Bayes' Theorem.
14. Total utility and marginal utility.
15. Vital statistics.

Turn over

Section B

Short Essay / paragraph Questions. Maximum marks in this section is 35.
Students can attempt all questions. Each question carries a maximum of 5 marks

16. How do you find the limit and continuity of a function ?

17. Assume that you have been given dice and a pack of 52 cards. You have to throw a dice and then you have to pick up a card. What is the probability that you picked up a red card and threw 6 on the dice ?

18. How do you know if events are mutually exclusive in probability ?

19. Explain time series analysis. What are the components of time series analysis ?

20. Explain economic application of derivatives. Assume that the total cost (C) and the total revenue (R) functions of a firm are given by $C = 5q^2 + 10$ and $R = -2q^2 + 6q$. Find the output level (q) at which the profit is maximum.

21. Explain Marshall-Edgeworth and Kelley's Methods of index number.

22. Prepare a note on any *four* types of vital statistics.

23. Differentiate between mutually exclusive and collectively exhaustive events ?

Section C

Long Essay Questions.
Answer any **two** *questions.*
Each question carries a maximum of 10 *marks.*

24. Explain Maxima and minima of functions. Find out the minimum and maximum values of :

$$Z \equiv 8X^3 + 2XY - 3X^2 + Y^2 + 1.$$

25. What are the Uses of Index Numbers ? Compute (i) Laspeyre's ; (ii) Paasche's ; and (iii) Fisher's index number for the following data :

	Price		Quantity	
Item	Base Year	Current Year	Base Year	Current Year
A	6	10	50	50
B	2	2	100	120
C	4	6	60	60
D	10	12	30	25

26. Discuss the uses of Vital Statistics.

27. What are the important types of probability ? Explain meaning and characteristics of classical probability siting suitable example.

(2 × 10 = 20 marks)

C 21589 (Pages : 4) Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2022

Economics

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

(2019 Admission onwards)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Answer at least **ten** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 30.

1. Evaluate the limit of the function :

$$\lim_{x \to 3} \frac{x^2 - 3x + 2}{x^2 - 5x + 6}.$$

2. Find the derivative for the following function '*y*' first principles :

   (i) $4x^2 + 2x + 3$;

   (ii) $\frac{x+2}{x-1}$;

   (iii) e^x ; and

   (iv) $\log x$.

3. What are the important conditions for Maxima and Minima ?

4. Explain the relationship between AC and MC.

5. What are the important utilities of Consumer price indices ?

6. What is Marshall- Edgeworth index number ?

Turn over

7. What do you meant by Moving average method ?
8. What do you meant by Vital Statistics ?
9. Define Crude death rate.
10. How to find the growth of population ?
11. Explain the term (i) Sample space ; and (ii) Random experiments
12. Explain the term (i) Equally like events ; and (ii) Exhaustive events
13. A die is thrown. Find the probability of getting (i) a '4' ; (ii) an even number ; (iii) less than 3 ; and (iv) '3'or'5'.
14. Explain the Classical definition of Probability.
15. From a bag containing 10 black and 20 white balls, a ball is drawn at random. What is the probability that it is black ?

(10 × 3 = 30 marks)

Section B (Short Essay Questions)

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

16. Find the Elasticity of demand for the demand function $x = \frac{27}{p^3}$.

17. (i) Find $\frac{dy}{dx}$ if $y = (x-4)^5 + \log 3x + 7e^{x-1}$.

    (ii) Find the value of $\frac{dy}{dx}$ if $2x^2 - 3xy + y^2 = 0$.

18. Define Trend. What are the various methods of measuring it ?

19. From the data given below construct the Consumer Price index number :

Commodity	Price relatives	weights
Food	250	45
Rent	150	15
Clothing	320	20
Fuel and lighting	190	5
Miscellaneous	300	15

20. What are the important measurements of Fertility ?

21. What are the important methods of obtaining Vital Statistics in India ?

22. One card is drawn from a standard pack of 52. What is the probability that is either a king or a queen ?

23. Explain the concept of Mutually exclusive events with an example.

(5 × 6 = 30 marks)

Section C (Long Essay Questions)

Answer any **two** *questions.*
Each question carries 10 *marks.*

24. Calculate Fisher's ideal index from the following data and prove that it satisfies both the time reversal and factor reversal tests :

Commodity	2018		2019	
	Price	Expenditure	Price	Expenditure
A	8	80	10	120
B	10	120	12	96
C	5	40	5	50
D	4	56	3	69
E	20	100	25	150

25. Define Probability. Briefly explain different types of Probability.

Turn over

26. (i) What are the important uses of Vital Statistics ?

(ii) What are the different measurements of Mortality ?

27. (i) Differentiate $y = \frac{(x+1)(2x+1)}{(x-3)}$.

(ii) Differentiate $x^5 + e^x$.

(2 × 10 = 20 marks)

C 3604 (Pages : 3) Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2021

Economics

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

Time : Two Hours and a Half Maximum : 80 Marks

Section A (Short Answer Questions)

Answer at least **ten** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 30.

1. Evaluate the limit of the function :

$$\lim_{x \to 3} \frac{x^2 - 2x - 3}{x^2 + x - 12}.$$

2. Find the $\frac{dy}{dx}$ of the following functions :

(i) $y = 5x^4$; (ii) $y = 5e^{3x}$; (iii) $y = \frac{5}{2x^2}$; and (iv) $y = 4x^{-5}$.

3. What are the important conditions for Maxima and Minima ?
4. Explain the relationship between AR, MR and Elasticity.
5. Distinguish between WPI and CPI.
6. Mention the three important characteristics of Index Numbers.
7. What is Factor reversal test ?
8. What do you mean by Principle of least squares ?
9. Define Infant Mortality rate.
10. What is Sex ratio ?

Turn over

11. Name different types of fertility rates.

12. Explain the term (i) Sample space ; and (ii) Sample point.

13. Explain Classical definition of Probability.

14. A box contains 2 white socks and 2 blue socks. Two socks are drawn at random.

    Find the probability 'p' they are match (same colour).

15. What is a mutually exclusive event ?

(10 × 3 = 30 marks)

Section B (Short Essay Questions)

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

16. Find if $y = \frac{x^2 - 1}{x^2 + 1}$.

17. The cost function for the production of 'x' units of an item is given by $10 - 4x^2 + 3x^3$.

    Find (i) Average cost ; and (ii) Marginal cost.

18. What are the general uses of index numbers ?

19. Calculate the index number for 2019 taking 2009 as base by price relative method using Arithmetic Mean :

Commodities	A	B	C	D
Price in Rs. (2009)	10	20	30	40
Price in Rs. (2019)	13	17	60	70

20. What are the important measurements of Mortality ?

21. Explain the concept of base shifting, splicing and deflating.

22. Two coins are tossed, what is the probability of getting (i) Both heads ; (ii) One head ; (iii) At least on head ; (iv) No head.

23. The letters of the word "STATISTICS" are written on 10 identical cards. If two cards are drawn at random, what is the probability that (i) one 'S' and one 'I' will occur ; (ii) two 'T' will occur.

(5 × 6 = 30 marks)

Section C (Long Essay Questions)

Answer any **two** *questions.*

Each question carries 10 *marks.*

24. What are the important components of Time Series ?

25. Calculate weighted index number by (i) Laspeyer's method ; (ii) Paasche s method ; (iii) Fisher index method ; and (iv) Marshall-Edge worth method from the data given below :

Commodity	Price		Quantity	
	Base Year	Current Year	Base Year	Current Year
A	4	7	10	8
B	5	9	8	6
C	6	8	15	12
D	2	1	5	6

26. Briefly elaborate the main indicators of Vital statistics.

27. Examine the function $f(x) = (x-1)^3 (x+1)^2$ for maxima and minima.

(2 × 10 = 20 marks)