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Reg. No:.............................
Name: ....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fourth Semester BA Economics Degree Examination, April 2023

BEC4C04 – Mathematical Methods for Economic IV

(2019 Admission onwards)

Time: 1 ½ hours

Max. Marks: 40

Part A

(Short Answer Type Questions. Maximum mark in this session is 10.
Students can attempt all questions
Each question carries maximum of 2 marks)

1. $\int \frac{4x^3+2}{(4x^4+8x)^9} \, dx$

2. Explain discriminating monopoly

3. What do you mean by Linear Programming

4. Explain integration by substitution

5. Explain marginal product

6. Explain rule of integration.

7. If $C = x^3 - 2x$, Find the MC.

Part B

(Short Essay questions. Maximum mark in this session is 20.
Students can attempt all questions.
Each question carries maximum of 5 marks)

8. Explain economic applications of definite integral.

9. Explain constraint optimization problem.

10. $\int_1^3 \frac{2x}{(x^2+1)} \, dx$

11. The demand function faced by a firm is $p=500-0.2x$ and its cost function is $C=25x+1000$.
Find the output at which the profits of the firm are maximum.

12. Explain advantages and limitations of Linear Programming Techniques.

Part C

13. Explain the different types of elasticity of demand. Given $Q = 700-2P+0.02Y$, where $P=25$ and $Y=5000$. Find price and income elasticity of demand.

14. Solve following LPP by graphic method

   Maximize $P = 5x+3y$

   Subject to $6x+2y \leq 36$

   $2x+4y \leq 28$

   $5x+5y \leq 40$

   $x, y \geq 0$

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fourth Semester BA Economics Degree Examination, April 2023

BEC4B05 – Quantitative Methods for Economic Analysis – II

(2019 Admission onwards)

Time: 2½ hours

Max. Marks: 80

Section-A

(Each question carries 2 Marks. Maximum Marks that can be scored in this section is 25)

1. Define an event? What is the probability of rolling two coins and getting Head first and then Tail?

2. A university has two departments, A and B. Department A has 40 faculty members, 10 of whom are women. Department B has 60 faculty members, 30 of whom are women. If a faculty member is selected at random, what is the probability that they are a woman?

3. What is an index number? What are the different types of index numbers?

4. An unbiased die is thrown two independent times. Given that the first throw resulted in an odd number. Find the probability that the sum obtained is 6.

5. State Bayes theorem of probability.

6. A box contains 3 white and 5 black balls, 3 balls are taken out at random, find the probability that they are one white and 2 black balls.

7. Differentiate between discrete and continuous probability distribution

8. How to create chart in MS Excel?

9. Define Random Experiment. Write down sample space of the random experiment of tossing of three unbiased coins.

10. What is the importance of Probability in economic analysis

11. Define Binomial Distribution. What are the characteristics of binomial distribution

12. What do you mean by marginal probability? A group consists of 200 peoples, out of these 120 are males and 80 are females. What is the probability that a male is selected?

13. What are the components of time series analysis?

14. Construct the price index number for 2022. by taking 2015 as base year

Commodities	Rice	Wheat	Flax seed	Cotton	Tobacco	Sugar
Price in 2015	10	8	25	45	18	22
Price in 2022	13	9	33	52	33	25

15. What are the different types of statistical functions available in MS-Excel?

Section-B

(Each question carries 5 Marks. Maximum Marks that can be scored in this section is 35)

16. Describe the terms mutually exclusive events and independent events. Give example for each of them

17. A card is drawn from an ordinary pack of 52 cards. What is the probability to get spade or an ace?

18. Discuss normal distribution, importance, its parameters and characteristics?

19. A box contains 15 papers which are numbered from 1 to 15. A paper is drawn random, find the probability that the number is a) even, b) less than 7, c) odd, d) even and less than 7.

20. Describe the difference between a trend and a seasonality in time series analysis. Give an example of each.

21. From the following data, calculate Laspeyer's and Paasche's the price index number

Items	2002		2022	
	Price	Quantity	Price	Quantity
A	22	10	42	8
B	52	12	62	7
C	42	15	52	17
D	22	22	22	27

22. Write down steps to draw trend line in MS Excel?

23. Differentiate binomial and Poisson Distribution. How to run Poisson distribution in MS excel?

Section-C

24. An insurance company insured 3000 scooter drivers, 2000 car drivers and 5000 truck drivers. The probability of accident by the drivers of these types of vehicles is 0.04, 0.02 and 0.03 respectively. One of the insure people meets an accident. What is the probability that he is a truck driver?

25. Suppose a company produces two models of a product, Model A and Model B. The probability that a randomly selected Model A unit will fail is 0.05, and the probability that a randomly selected Model B unit will fail is 0.03. The company produces 60% Model A and 40% Model B. What is the probability that a randomly selected unit will fail?

26. Calculate the Fisher's ideal index for the year 2022and show that it satisfies both time reversal and factor reversal test?

Items	2010		2022	
	Price	Quantity	Price	Quantity
A	130	25	235	42
B	250	36	366	30
C	255	45	410	50
D	190	36	466	45
E	300	14	380	28
F	289	10	400	19

27. What are the various components of a time series? Draw a straight-line trend using OLS and estimate trend value for 2023

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Sale	100	120	130	140	150	170	180	190	200	220

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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. What do you mean by nominal rate of interest.

2. What is hyper inflation?

3. What do you mean by sacrifice ratio?

4. Define stagflation

5. What is MPC ? Give Illustrations.

6. What do you mean by expected inflation?

7. Define autonomous investment

8. What do you mean by subprime crisis?

9. Define real rate of interest

10. What is government tax multiplier?

11. Define effective demand

12. What do you mean by inflationary gap

13. Define MEI

14. What do you mean by business cycle?

15. Prepare a short note on great depression

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 measures of inflation

17. Prepare a note on Fisher Effect

18. Distinguish between demand pull versus cost push inflation

19. Discuss the relationship between MEC and rate of interest

20. What are the factors causes shift in LM curve

21. Discuss the phases of business cycle

22. Discuss the goods market equilibrium and IS curve

23. Critically examine the Schumpeter's theory on trade cycle.

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

24. Does Phillip's curve hold in the long run? Discuss the dynamics of short run and long run Phillip's curve?

25. What is unemployment? What are its types and measures?

26. Critically examine the Keynesian cross model of expenditure

27. Discuss the impact of Global recession 2008 on Indian economy