

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE  
Fourth Semester BA Economics Degree Examination, March /April 2019  
BECO4C04 – Mathematical Methods for Economics IV  
(2017 Admission onwards)

Time: 1.30 hours

Max. Marks: 40

**PART A – Answer all questions**  
**Multiple Choice Questions**

In linear programming, lack of points for a solution set is said to

- a) have no feasible solution
- b) have a feasible solution
- c) have single point method
- d) have infinite point method

In maximization problem, optimal solution occurring at corner point yields the

- a) mean values of z
- b) highest value of z
- c) lowest value of z
- d) mid values of z

If  $y = x^6$ , then  $\int y \, dx =$

- a)  $\int y \, dx = \frac{x^7}{7} + c$
- b)  $\int y \, dx = \frac{x^7}{6} + c$
- c)  $\int y \, dx = \frac{x^5}{6} + c$
- d)  $\int y \, dx = \frac{x^5}{5} + c$

If  $y = 18e^{-3x}$ , then  $\int y \, dx =$

- a)  $\int y \, dx = 6e^{-3x} + c$
- b)  $\int y \, dx = -6e^{3x} + c$
- c)  $\int y \, dx = -54e^{-3x} + c$
- d)  $\int y \, dx = -6e^{-3x} + c$

Write down the partial differential  $\left(\frac{\partial f}{\partial x}\right)_{y,z}$  of the following function:

$$f(x, y, z) = 4x^5 - 3x^4y + 2x^2y^2z + 6xy^2 - 7yz^3$$

a)

$$\left(\frac{\partial f}{\partial x}\right)_{y,z} = 20x^4 - 3x^4 + 4x^2yz + 12y^2$$

b)

$$\left(\frac{\partial f}{\partial x}\right)_{y,z} = 20x^4 - 12x^3y + 4xy^2z + 6y^2$$

c)

$$\left(\frac{\partial f}{\partial x}\right)_{y,z} = 20x^4 - 12x^3y + 4xy^2 + 6xy$$

d)

$$\left(\frac{\partial f}{\partial x}\right)_{y,z} = 4x^2y^2 - 21yz^3$$

Select the **incorrect** partial derivative relationship from the list below:

a)  $\left(\frac{\partial y}{\partial x}\right)_z = -\left(\frac{\partial y}{\partial z}\right)_x \left(\frac{\partial z}{\partial x}\right)_y$

b)  $\left(\frac{\partial y}{\partial x}\right)_z = \frac{1}{\left(\frac{\partial x}{\partial y}\right)_z}$

c)  $\left(\frac{\partial f}{\partial x}\right)_z = \left(\frac{\partial f}{\partial y}\right)_z + \left(\frac{\partial f}{\partial x}\right)_y \left(\frac{\partial y}{\partial x}\right)_z$

d)  $\left(\frac{\partial f}{\partial x}\right)_z = \left(\frac{\partial f}{\partial x}\right)_y + \left(\frac{\partial f}{\partial y}\right)_x \left(\frac{\partial y}{\partial x}\right)_z$

(6 x ½ = 3 Marks)



**PART B – (Very Short Answer Type Questions)**  
**Answer any five questions**

Separate the variables and integrate the following:

$$\frac{dy}{dx} = y^2 x^3$$

Evaluate the following integral:

$$y = \int_1^4 x^5 + 2x^3 - 6x^2 - 10 \, dx$$

Evaluate the following integral:

$$y = \int_1^{e^3} \frac{5}{x} \, dx$$

- . Write a note on use of constrained optimization techniques in economics
- . Briefly examine the elasticity function mathematically.
- . Write a note on LPP
- . Explain the components of LPP
- . Explain Lagrangian method.

**(5 x 2 = 10 Marks)**

**PART C – (Short Essay)**  
**Answer any three questions**

a) The marginal revenue function of a commodity is given as

$MR = 12 - 3x^2 + 4x$  Find the total revenue and the corresponding demand function.

(b) For a certain item the demand curve is  $P = D(q) = \frac{2q}{q+1}$  and the supply curve is

$p = S(q) = q + 2$ . Find the equilibrium price and equilibrium quantity. Then compute the consumer and producer surplus.

It is given that  $P^d = 60 - 2q$  and  $P^s = 30 + 4q$ . Find consumer surplus.

Solve the following LPP (linear programming problem) graphically by using iso-profit method

$$\text{Maximize } Z = 50x + 10y$$

$$\text{Subject to } x + y \leq 30$$

$$4x + y \leq 80$$

$$x, y \geq 0$$

18. For the following demand functions, determine whether demand is elastic, inelastic or unitary elastic at the given price.

(a)  $Q=100-4P$  and the given  $P=Rs.20$

(b)  $Q= 1500-20P$  and the given  $P=Rs.5$

(c)  $P=50-0.14Q$  and the given  $P=Rs.20$

(3 x 5 = 15 Marks)

**PART D – (Essay Questions)**

**Answer any one of the following questions**

19. The following table summarizes the key facts about two products, A and B, and the resources, Q, R, and S, required to produce them.

Resource	Resource Usage per unit produced		Amount of resources Available
	Product A	Product B	
Q	2	1	10
R	3	3	20
S	2	4	20
Contribution per Unit	20	30	

All the assumptions of linear programming hold.

- Formulate a linear programming model for this problem.
- Solve this model graphically.

20. Consider a production function given by

$$Y = 30x_1 + 12x_2 - x_1^2 + x_1x_2 - x_2^2$$

Let the prices of  $x_1$  and  $x_2$  be 10 and 4 respectively with a cost constraint of Rs. 260. Find the optimal solutions using langrangian method and check Hessian conditions for maxima or minima

(1 x 12 = 12 Marks)



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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE  
 Fourth Semester BA Economics Degree Examination, March /April 2019  
 BECO4B05 – Quantitative Methods for Economic Analysis - II  
 (2017 Admission onwards)

Time: 3 hours

Max. Marks: 80

**SECTION A**

**Answer all questions. Each question carries  $\frac{1}{2}$  marks**

1. The least square estimators are
 

(a) Period estimators	(b) Point estimators
(c) Population estimators	(d) popular estimators
2. Classical probability is also known as
 

(a) Laplace's probability	(b) Empirical probability
(c) A priori probability	(d) All the above
3. A set which does not contain any element is called
 

(a) Empty set	(b) Null set
(c) Void set	(d) All the above
4. The value of probability is lies between
 

(a) -1 to +1	(b) 0 to 1
(c) -1 to 0	(d) None of the above
5. An event whose occurrence is inevitable is called
 

(a) Sure event	(b) Certain events
(c) Sample space events	(d) All the above.
5. Mean of binomial distribution is
 

(a) np	(b) $\sqrt{npq}$
(c) m	(d) None of the above
7. Mean, Median and Mode are equal for a
 

(a) Binomial distribution	(b) Poisson distribution
(c) Normal distribution	(d) None of the above
8. Mean and variance of .....distribution is equal.
 

(a) Binomial distribution	(b) Poisson distribution
(c) Normal distribution	(d) None of the above

9. If one of them must and only one can happen in the case of .....events.  
 (a) Mutually exclusive and exhaustive (b) Mutually exclusive  
 (c) Exhaustive (d) None of the above
10. The probability of throwing an odd sum with two fair dice is  
 (a)  $1/4$  (b)  $1/16$   
 (c) 1 (d)  $1/2$ .
11. If  $P(A) = 1/4$  and  $P(A \cap B) = 1/16$ , find  $P(B/A)$   
 (a)  $1/4$  (b)  $1/16$   
 (c) 1 (d)  $1/2$
12. One of the assumptions of CLRM is that the values of the explanatory variable must  
 (a) All positive (b) Not all be the same  
 (c) All negative (d) Average to zero

(12 x  $1/2$  = 6 Marks)

### SECTION B

Answer Any ten questions. Each question carries 2 marks

13. Define inverse probability.
14. What are the properties of probability distribution and distribution function?
15. What is coefficient of determination?
16. What is formula syntax?
17. What is meant by binomial distribution? Write down the important properties of binomial distribution.
18. Define conditional probability.
19. What is the difference between sample space and sample point?
20. Bring out the fallacy in the following "The mean of Binomial distribution is 5 and SD is 3".
21. Define Addition and Multiplication theorems of probability.
22. Define inverse probability.
23. What are the properties of probability distribution and distribution function?
24. If mean of a Poisson distribution is 1.5, find Mode and Standard Deviation.

(10 x 2 = 20 Marks)



### SECTION C

Answer any Six questions. Each question carries 5 marks

5. How to create trend lines in MS Excel using regression analysis tool pack?
6. Explain creation and manipulation of charts in MS excel
7. If 3% of electric bulbs manufactured by a company are defective, find the probability that in a sample of 100 bulbs exactly 5 bulbs are effective.
8. The probability of a husband and a wife surviving for 20 more years are 0.8 and 0.9 respectively. Find the probability that after 20 years (i) Both of them are alive (ii) At least one of them is alive.
9. Eight coins were tossed together, 256 times .Find Mean and standard deviation.
10. The probability of a husband and a wife surviving for 20 more years are 0.8 and 0.9 respectively. Find the probability that after 20 years (i) Both of them are alive (ii) At least one of them is alive.
11. Distinguish between the Sample Regression Function and Population Regression Function.
12. What are the assumptions and properties of OLS estimators?

(6 x 5 = 30 Marks)

### SECTION D

Answer any Two questions. Each question carries 12 marks

3. State Bayes theorem. Two urns I&II contains respectively 3 white and 2 black balls, 2 White and 4 black balls. One ball is transferred from urn I to urn II and then one is drawn from the latter. It happens to be white .What is the probability that the transferred ball was White.
4. Explain the Classical Linear Regression Model.
5. Briefly explain different definitions of probability.
5. A box contains 8 red, 3 white and 9 blue balls are drawn at random, determine the probability that (a) all three are blue (b) 2 are red and 1 is white (c) at least one is white and (d) one of each colour is drawn.

(2 x 12 = 24 Marks)



FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE  
 Fourth Semester BA Economics Degree Examination, March /April 2019  
 BECO4B06 – Macro Economics II  
 (2017 Admission onwards)

Time: 3 hours

Max. Marks: 80

**SECTION A**

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

1. The IS-LM Model was developed by
  - a. J M Keynes
  - b. Patinkin
  - c. Hicks and Hansen
  - d. Schumpeter
  
2. The book ' A Treatise on Money is authored by
  - a. J M Keynes
  - b. Irving Fischer
  - c. Milton Friedman
  - d. None of these
  
3. According to Keynes, there is
  - a. No direct relationship between the quantity of money and price level
  - b. direct relationship between money and price level
  - c. no direct relationship between demand for money and supply of money
  - d. direct relationship between demand for money and supply of money
  
4. According to the Monetarist money supply constitute
  - a. currency + demand deposits
  - b. currency + demand deposits + time deposits
  - c. currency + Demand Deposits + time deposits + equity shares
  - d. currency + all bank deposits+ equity shares
  
5. The concepts of inside money and outside money is given by
  - a. Milton Friedman
  - b. J M Keynes
  - c. Gurley and Shaw
  - d. None of these
  
6. Which one of the following measure of money supply in India is known as narrow money?
  - a.  $M_0$
  - b.  $M_1$
  - c.  $M_2$
  - d.  $M_3$



7. The quantity theory of money first propounded in 1588 by an Italian Economist  
 a. David Hume                      b. Davanzatti                      c. J S Mill                      d. Ricardo
8. What is the shape of Long Run Phillips curve is  
 a. Inverted U shape                      b. Horizontal                      c. Inverse L shape                      d. Vertical
9. The Great Depression was in the year  
 a. 1930                      b. 1931                      c. 1940                      d. 1936
10. Investment is a function of  
 a. Dumping                      b. Income                      c. Saving                      d. interest
11. "Interest is poorly a monetary phenomenon" is a very famous statement made by  
 a. J M Keynes                      b. Hamilton                      c. Friedman                      d. J B Say
12. Currency issued by the central Bank is a form of ..... money  
 a. Inside money                      b. Outside Money                      c. Near Money                      d. Hot Money

(12 x ½ = 6 Marks)

### SECTION B

Answer Any ten questions. Each question carries 2 marks

13. What is tax Multiplier?
14. Define Mixed Inflation?
15. Explain the term Effective Demand?
16. What is real and nominal interest rate ?
17. Define NAIRU
18. What do you mean by Demonetization?
19. Distinguish between CPI and WPI?
20. Define open market operation?
21. Explain Okun's Law?
22. Define Stagflation?
23. Explain the term Sacrifice Ratio?
24. Define Liquidity Trap?

(10 x 2 = 20 Marks)

### SECTION C

Answer Any six questions. Each question carries 5 marks

1. Explain the major functions of Money?
2. Discuss the Classical theory of Demand for Money?
3. Explain the important measures to control inflation?
4. Define Unemployment? Explain different type's unemployment?
5. Critically evaluate Keynesian Theory of Trade Cycle?
6. Explain the important factors shifting the IS and LM Curve?
7. Explain the Restatement of Quantity Theory of Money?
8. Distinguish between demand pull and cost push inflation.

(6 x 5 = 30 Marks)

### SECTION D

Answer Any two questions. Each question carries 12 marks

3. Elucidate the derivation of IS and LM curves. Explain equilibrium using IS & LM Frame work ?
4. Critically examine the Liquidity Preference theory of Keynes?
5. How does the Phillips Curve explain the tradeoff between unemployment and money wage rate? Discuss its policy implication? How Friedman established Long Run Phillips curve from the original Phillips curve?
6. What do you mean by Business Cycle? Explain the different phase and types of Business Cycle?

(2 x 12 = 24 Marks)