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D1BEC2401

Name: .....

Reg. No.: .....

FIRST SEMESTER FYUGP EXAMINATION NOVEMBER 2024

ECONOMICS & MATHEMATICS

MAJOR

ECO1CJ103: ANALYTICAL TOOLS FOR ECONOMICS

Time: 2 Hrs. **Maximum Marks: 70**

M: Mark BL: Bloom's Taxonomy Level (1 to 6) CO: Course Outcome

Section A: Answer all questions. Each carries 3 marks. Ceiling: 24 Marks				
No.	**Question**	**M**	**BL**	**CO**
1.	Find the inverse of the function f(x)= 1/x.	3	1	CO1 CO2 CO4
2.	Write the general form of a quadratic function and explain.	3	3	CO1 CO2
3.	A bag contains 5 black and 3 white balls. Two balls are drawn. Find the probability that both are black.	3	2	CO2 CO3
4.	What is conditional probability? Provide a simple example.	3	4	CO1 CO2 CO3
5.	Explain the difference between covariance and correlation.	3	1	CO1 CO2 CO3
6.	Z follows normal distribution with mean = 0 and variance =1, find P(Z≤1.52).	3	3	CO1 CO3 CO4
7.	If a Poisson process has a mean of 3, find the probability of 3 events occurring.	3	5	CO1 CO3 CO4
8.	Write the equation of a normal distribution function.	3	2	CO3
9.	State the steps involved in hypothesis testing.	3	1	CO1 CO2
10.	Give an example of a situation where a one-tailed test is used.	3	3	CO1 CO4
Section B: Answer all questions. Each carries 6 marks. Ceiling: 36 Marks				
No.	**Question**	**M**	**BL**	**CO**
11.	Demand function: Qd=120−4P Supply function: Qs=40+P. Calculate the equilibrium price and quantity. Find quantity demanded and supplied at P = 25.	6	5	CO2 CO4

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12.	Using implicit differentiation, derive dy/dx for x3+y3 = 6xy.	6	3	CO1 CO2 CO4
13.	Find the second derivative of f(x) = 3x3−4x2+2x−5 and evaluate at x = 5.	6	5	CO1 CO2 CO4
14.	Compare the axiomatic and empirical approaches to probability with examples.	6	2	CO1 CO3
15.	Fit Poisson distribution for the following data: No of printing mistakes per page: 0 | 1 | 2 | 3 No of pages: 56 | 29 | 13 | 2	6	6	CO3
16.	Explain the properties of t distribution.	6	1	CO1
17.	Analyze Fisher's properties of an estimator.	6	4	CO1 CO2
18.	Illustrate the steps involved in conducting a Chi-square test for independence.	6	6	CO1 CO4

Section C: Answer any one question. Each carries 10 marks. (1 x 10 = 10 Marks)

No.	Question	M	BL	CO
19.	Find out the coefficient of correlation between the sales and expenses of the following 10 firms (figures in '000Rs.). Interpret the results. Firms: 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 Sales: 50 | 50 | 55 | 60 | 65 | 65 | 65 | 60 | 60 | 50 Expenses: 11 | 13 | 14 | 16 | 16 | 15 | 15 | 14 | 13 | 13	10	4	CO1 CO4
20.	Compare and contrast normal and standard normal distribution.	10	4	CO3