D1BEC2502

Name: .....

Reg. No.: .....

FIRST SEMESTER FYUGP EXAMINATION NOVEMBER 2025

(Regular/Improvement/Supplementary)

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.	State the standard form of an exponential function.	3	2	CO1 CO2
2.	Identify whether the function $f(x)=3x+15x^2$ is linear or nonlinear. Interpret.	3	4	CO2 CO4
3.	Explain the chain rule of derivatives with an example.	3	3	CO1 CO2
4.	What is meant by independent random variables?	3	1	CO1
5.	Find the correlation coefficient for two variables with covariance 10 and standard deviations are 4 and 5.	3	4	CO1 CO4
6.	In a locality there are 150 families having 5 children. Find the expected number of families with exactly two girls.	3	3	CO1 CO4
7.	What is the null hypothesis in hypothesis testing?	3	1	CO1 CO2
8.	Explain the use of F-distribution in hypothesis testing.	3	5	CO1 CO3 CO4
9.	Define the null hypothesis for a test of proportion.	3	2	CO1 CO4
10.	When is the Chi-square test of goodness of fit applied?	3	4	CO1 CO2 CO4

Section B: Answer all questions. Each carries 6 marks.
Ceiling: 36 Marks

No.	Question	M	BL	CO
11.	Discuss the importance of the first and second derivatives in economics.	6	6	CO4
12.	If a coin is tossed 10 times, what is the probability of getting exactly 7 heads?	6	3	CO1 CO3 CO4
13.	Find the probability distribution of the sum when two dice are rolled.	6	4	CO1 CO3 CO4
14.	Compute the variance and standard deviation of the following data: X={2,4,6}, P(X)={0.3,0.5,0.2}	6	2	CO1 CO2
15.	Compare and contrast the PMF and PDF with examples.	6	2	CO2 CO3
16.	Explain the concept of asymptotic normality using CLT.	6	3	CO1 CO2 CO3
17.	A sample of 25 students has a mean score of 70 with a standard deviation of 8. Construct a 99% confidence interval for the population mean.	6	3	CO1 CO2 CO4
18.	Explain the role of the critical region in hypothesis testing using an example.	6	2	CO1 CO2

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

No.	Question	M	BL	CO
19.	Given the demand function Q = 36-2P and cost function TC = 12Q. Find: (i) Marginal Revenue at Q = 2 (ii) Average Revenue at Q =5 (iii) Find profit at Q =10	10	5	CO4
20.	A machine manufacturing screws is known to produce 5 percent defective. In a random sample of 15 screws what is the probability that there are: (i) exactly three defectives (ii) not more than four defectives (iii) at least 2 defectives	10	6	CO3 CO4