

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

I MBA I Semester Regular & Supplementary Examinations, February, 2025

**MANAGERIAL ECONOMICS
(MASTER OF BUSINESS ADMINISTRATION)**

Time: 3 Hrs

Max. Marks: 60

**Answer any Five questions
All questions carry EQUAL marks
Question No. 8 is Compulsory**

1. a) Define Managerial Economics. Explain its importance in business decision-making and its relationship with other branches of economics like Microeconomics and Macroeconomics. **6M**
b) Explain the concept of Opportunity Cost. How can managers apply this principle when making business decisions, particularly when faced with limited resources? Provide examples. **6M**
2. a) Examine the Law of Demand and its determinants. How do changes in consumer income, tastes, and the prices of related goods affect demand? Provide examples of each factor. **6M**
b) What is Demand Forecasting? Explain the different types of demand forecasting methods (Qualitative and Quantitative). How do firms use these methods to predict future demand and plan production? **6M**
3. a) What are the various Cost Concepts (Fixed, Variable, Total, Marginal, and Average Costs) and their significance in Managerial Decision-Making? Explain with examples. **6M**
b) What is Cost-Volume-Profit (CVP) analysis? How can businesses use CVP analysis to determine the Break-Even Point and make decisions about Pricing and Product Mix? **6M**
4. a) What is the Theory of Production? Explain the Law of Diminishing Returns and its implications for a firm's decision-making in the short run. **6M**
b) Explain the Cobb-Douglas Production Function. What are its key properties, and how can a firm use this production function to determine the optimal combination of inputs (Labor and Capital)? **6M**
5. a) Compare and contrast Perfect Competition, Monopoly, Monopolistic Competition, and Oligopoly. How do firms in each market structure set their Pricing and Output decisions in the short run and long run? **6M**
b) What are the Pricing strategies used by firms in Monopolistic Competition and Oligopoly? Discuss how firms in these market structures use Product Differentiation, Branding, and Market Power to influence prices. **6M**

6. a) What are the key concepts of National Income? Discuss the various methods of measuring National Income, such as the Production, Income, and Expenditure Approaches. **6M**
- b) Discuss the Business Cycle and its different phases (Expansion, Peak, Recession, and Recovery). How do fluctuations in the Business Cycle affect firm-level decisions related to Production, Investment, and Hiring? **6M**
7. a) Discuss the concept of Returns to Scale. How do Increasing, Constant, and Decreasing Returns to Scale affect a firm's production decisions in the long run? Provide real-world examples. **6M**
- b) How do barriers to entry affect market structures such as Monopoly and Oligopoly? Discuss how Monopolies and Oligopolies set prices and output compared to firms in Perfectly Competitive Markets. **6M**
8. **CASE STUDY:**
 XYZ Ltd. is manufacturing and selling four types of products A, B, C and D. **12M**
 The sales mix and variable costs are as follows:
 Product Sales per month Variable Cost Ratio A 2,00,000 50% B 1,50,000 50% C 1,00,000 75% D 2,50,000 40% The fixed costs are Rs. 1,50,000 per month.

Product	Sales per month	Variable Cost
A	2,00,000	1,00,000
B	1,50,000	75,000
C	1,00,000	50,000
D	2,50,000	1,25,000

The fixed costs are Rs. 1,50,000 per month. Calculate Break-Even Point.
 Draw a Break-Even Chart for the Above Data

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

Marks

1. a) Explain the concept of conditional probability. Given $P(A) = 3/8$, $P(B) = 5/2$ and $P(A \cup B) = 3/4$ then find $P(A/B)$ and $P(B/A)$. 7M

- b) Two boxes contain respectively 2 red and 2 black balls and 2 red and 4 black balls. One ball is transferred from one box to another and then one ball is selected from the second box. If it turns out to be black, what is the probability that the transferred ball was red? Using Baye's theorem. 7M

(OR)

2. a) Define discrete and continuous random variables. Explain its important properties. 7M

- b) Suppose the joint p.m.f of x and y be given by 7M

$$f(x,y) = \frac{(x+y)}{30} \quad \text{for } x=0,1,2,3 \text{ and } y=0,1,2. \text{ Find the marginals of x and y.}$$

UNIT-II

- 3 Telephone calls arrive at a switchboard following an Poisson distribution with parameter $\lambda = 12$ per hour. If we are at the switchboard, what is the probability that the waiting time for a call is i) at least 15 minutes ii) not more than 10 minutes. Iii) exactly 8 minutes. Using Poisson distribution. 14M

(OR)

- 4 a) Define Normal distribution. Explain its properties. 7M

- b) A proof-reader catches a misprint in a document with probability 0.8. Find the expected number of misprints in the document in which the proof-reader stops after catching the 20 misprints. 7M

UNIT-III

- 5 a) Explain the concepts (i) Parameter (ii) Statistic (iii) Sampling distribution 4M

- b) A light bulb company claims that the 100-watt light bulb it sells has an average life of 1200 hours with a standard deviation of 100 hours. For testing the claim 50 new bulbs were selected randomly and allowed to burn out. The average lifetime of these bulbs was found to be 1180 hours. Is the company's claim is true at 5% level of significance? Using large sample test for single mean. 10M

(OR)

- 6 a) Explain (i) the procedure of testing of hypothesis (ii) power of the test. 4M

- b) In a random sample of 100 persons from town A, 60 are found to be high consumers of wheat. In another sample of 80 persons from town B, 40 are found to be high consumers of wheat. Do these data reveal a significant difference between the proportions of high wheat consumers in town A and town B (at $\alpha = 0.05$)? Using large sample test for difference of proportions. 10M

UNIT-IV

- 7 a) A manufacturer claims that a special type of projector bulb has an average life 160 hours. To check this claim, an investigator takes a sample of 20 such bulbs, puts on the test, and obtains an average life 167 hours with standard deviation 16 hours. Assuming that the life time of such bulbs follows normal distribution, does the investigator accept the manufacturer's claim at 5% level of significance? Using t- test for single mean. 7M

- b) A random sample of 18 pairs of observations from a normal population gave a correlation coefficient of 0.7. Test whether the population correlation coefficient is zero at 5% level of significance. 7M

(OR)

- 8 A company has introduced a new brand product. The marketing manager wants to know whether the preference for the brand is distributed independent of the consumers education level. The survey of a sample of 400 consumers gave the following results. Test the managers claim at 5 % level. Using chi-square test for independence of attributes. 14M

Education /Preferences	Illiterate	Literate	High School	Graduate
Brought new brand	50	55	45	60
Did not buy new brand	50	45	55	40

UNIT-V

- 9 Arrival rate of telephone calls at a telephone booth are according to Poisson distribution with an average time of 12 minutes between two consecutive call arrivals. The length of telephone calls is assumed to be exponentially distributed with mean 4 minutes. i) Find the probability that a caller arriving at the booth will have to wait. ii) Find the average queue length that forms from time to time. iii) Find the fraction of a day that the phone will be in use. iv) What is the probability that an arrival will have to wait for more that 15 before the phone is free. 14M

(OR)

- 10 a) Construct np-chart for the number of defectives for varying sample size to the following data 7M

Lot No	1	2	3	4	5	6	7	8	9	10	11	12
Sample Size	1450	895	1060	1325	1450	965	1750	1125	1344	1522	1475	1620
No. of defectives	93	65	103	124	175	126	147	168	94	125	136	286

- b) In a super market, the average arrival rate of customer is 10 every 30 minutes following Poisson process. The average time taken by a cashier to list and calculate the customer's purchase is 2.5 minutes following exponential distribution. What is the probability that the queue length exceeds 6? 7M