PVP21

Code No: **21BA1T5**

I MBA - I Semester Supplementary Examinations
DECEMBER - 2024

QUANTITATIVE ANALYSIS FOR BUSINESS DECISION

Duration: 3 Hours Max. Marks: 70

Note: 1. This question paper contains three Parts-A, Part-B and Part-C.
2. Part-A contains 8 short answer questions. Answer any **Five** Questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.
4. Part-C contains one Case Study for 10 Marks.
5. All parts of Question paper must be answered in one place

PART - A

1. a)	Calculate the mean, median, and mode for the following data: Data: 10, 15, 20, 25, 30, 35, 40.
1. b)	Illustrate the characteristics of Skewness and Kurtosis.
1. c)	Sketch the importance of probability concept.
1. d)	Distinguish Binomial and Poisson distributions.
1. e)	Classify Type I and Type II errors in hypothesis testing procedure.
1. f)	Mention the purpose of a paired t-test with suitable example.
1. g)	Narrate the standard form of a Linear Programming Problem.
1. h)	Extract the concept of Saddle Point in Game Theory.

PART – B

			BL	CO	Max. Marks
		UNIT – I			
2.	a)	Discuss the significance of measures of dispersion in statistical analysis.			5 M
	b)	Using the following data calculate Karl Pearson's coefficient of correlation between marks and the grades.			5 M

			Marks	40	35	50	60	55		
			Grades	4	3	5	6	5		
OR										
3.	a)	Based on the following data, derive the Regression Equation.								5 M
			X	2	4	6	8	9		
			Y	3	6	9	12	14		
	b)	The heights of 50 students are summarized as follows: Mean = 160 cm, Standard deviation = 10 cm. Find the coefficient of skewness if the median is 165 cm.								5 M
UNIT – II										
4.	a)	A bag contains 3 red balls, 5 blue balls and 7 green balls. What is the probability of drawing? i) A red ball ii) A ball that is not blue.								5 M
	b)	In a Poisson distribution, if the mean number of accidents in a week is 4, find the probability of exactly 2 accidents in a week.								5 M
OR										
5.	a)	The probability of success in a single trial is 0.2. If there are 10 trials, find the probability of getting exactly 3 successes using the Binomial distribution.								5 M
	b)	The weights of individuals in a population are normally distributed with a mean of 60kg and a standard deviation of 5kg. What percentage of individuals weight between 55kg and 65kg?								5 M
UNIT-III										
6.	a)	Explain the steps involved in hypothesis testing.								5 M
	b)	A machine produces packets of sugar. A sample of 100 packets shows a mean weight of 1.02kg with a standard deviation of 0.05kg. Test whether the machine produces packets of 1kg at a 5% significance level.								5 M

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<tr><td colspan="4">OR</td></tr>
<tr><td>7.</td><td>a)</td><td>Narrate the importance of paired sample tests in research with appropriate examples.</td><td>5 M</td></tr>
<tr><td></td><td>b)</td><td>A random sample of size 25 has a mean of 15 and a variance of 4. Test whether the population mean is 14 at a 5% significance level.</td><td>5 M</td></tr>
<tr><td colspan="4"><u>UNIT – IV</u></td></tr>
<tr><td>8.</td><td>a)</td><td>A company produces two products, A and B. Each unit of A requires 3 hours of labor and 2 hours of machine time. Each unit of B requires 4 hours of labor and 1 hour of machine time. The labor and machine time availability are 12 hours and 6 hours, respectively. Formulate this problem as a linear programming problem.</td><td>5 M</td></tr>
<tr><td></td><td>b)</td><td>Discuss the assumptions of the Simplex method in solving LPP.</td><td>5 M</td></tr>
<tr><td colspan="4">OR</td></tr>
<tr><td>9.</td><td>a)</td><td>Explain the Significance of Slack, Surplus and Artificial variables in LPP.</td><td>5 M</td></tr>
<tr><td></td><td>b)</td><td>Solve the following LPP graphically:
Maximize $Z = 3X+5Y$, subject to:
$X+Y \leq 4$, $2X + Y \leq 6$, $X \geq 0$, $Y \geq 0$.</td><td>5 M</td></tr>
<tr><td colspan="4"><u>UNIT – V</u></td></tr>
<tr><td>10.</td><td>a)</td><td>Describe the steps involved in solving a transportation problem using the MODI method.</td><td>5 M</td></tr>
<tr><td></td><td>b)</td><td>Solve the following transportation problem using the North-West Corner method:
<table>
<tr><td></td><td></td><td></td><td></td><td></td><td>Available</td></tr>
<tr><td></td><td>2</td><td>3</td><td>11</td><td>7</td><td>6</td></tr>
<tr><td></td><td>1</td><td>0</td><td>6</td><td>1</td><td>1</td></tr>
<tr><td></td><td>5</td><td>8</td><td>15</td><td>9</td><td>10</td></tr>
<tr><td>Requirement</td><td>7</td><td>5</td><td>3</td><td>2</td><td></td></tr>
</table></td><td>5 M</td></tr>
<tr><td colspan="4">OR</td></tr>
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<tr><td>11.</td><td>a)</td><td>Use the dominance method to solve the following payoff matrix:
<table><tr><td></td><td>Player B1</td><td>Player B2</td></tr><tr><td>A1</td><td>4</td><td>6</td></tr><tr><td>A2</td><td>2</td><td>8</td></tr></table></td><td>5 M</td></tr>
<tr><td></td><td>b)</td><td>Define and explain the dominance method in game theory with an example.</td><td>5 M</td></tr>
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PART –C

			BL	CO	Max. Marks
12.		A mid-sized manufacturing company, ABC Industries, produces two products: Product X and Product Y. The management wants to optimize production and distribution while ensuring customer satisfaction. The company faces challenges in decision-making regarding production planning, resource allocation, and market forecasting. The management collected the following sales data (in units) for Product X in the last 12 months as, 120,150,130,140,160,170,150,140,130,135,145,155. Questions: 1. Calculate the mean, median, and mode of the sales data to summarize sales performance. 2. Compute the standard deviation to understand the variation in sales. 3. Analyze the skewness of the data to determine if the sales distribution is symmetric. 4. Determine the correlation between monthly advertising expenses and sales performance using Karl Pearson's method.			10 M