Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – December 2025
Programme Name: BBA (ML)
Semester: I
Subject Code: UG32T2105
Subject Name: QUANTITATIVE TECHNIQUES

Date: 15.12.2025 Max Marks: 70
Duration: 03 Hrs Pass Marks: 35

General Instructions

(i) All Sections (A, B & C) are to be attempted.
(ii) Options, if any, are specified in respective section.

Section A

Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable.

1.Which of the following is a measure of central tendency?
A. Range B. Mean
C. Standard Deviation D. Quartile Deviation

2. Karl Pearson's coefficient is used to measure:
A. Dispersion B. Skewness
C. Correlation D. Trend

3. The sum of probabilities in a sample space is:
A. 1 B. 0
C. Depends on sample D. Negative

4. A scatter diagram is used in:
A. Time Series B. Regression Analysis
C. Probability Theory D. Index Numbers

5. Laspeyres method is used for constructing:
A. Trend B. Correlation
C. Index Numbers D. Regression Equation

6. Which is not a type of regression?
A. Simple B. Multiple
C. Partial D. Circular

7. Which distribution is discrete?

A. Normal
B. Binomial
C. Poisso
D. Both Binomial & Poisson

8. Quartile Deviation is also called:
A. Average deviation
B. Interquartile range
C. Mean deviation
D. Standard deviation

9. In time series, seasonal component refers to:
A. Long-term movement
B. Short-term fluctuations
C. Random variations
D. Cyclical variations

10. Bayes' theorem deals with:
A. Conditional probability
B. Regression
C. Dispersion
D. Index Numbers

Section B

Five Questions of 02 Marks each

11. Calculate Bowley's coefficient of skewness for this dataset: 12, 17, 20, 22, 24, 27, 30.

12. A time series covers production figures: Year: 2017—100, 2018—110, 2019—120, 2020—140, 2021—150. Use the least squares method to fit a straight-line trend and estimate production for 2022.

13. Define deterministic and probabilistic models in quantitative techniques.

14. State any two methods to measure dispersion.

15. If a random variable X has a binomial distribution with n = 8 and p = 0.25, what is the probability X = 2?

Section C

Seven Questions of 10 Marks each of which any 05 questions to be answered.

16. A marketing researcher collects the following data on advertising expenses (in thousands) and corresponding sales (in lakhs) for six months:

Month	**1**	**2**	**3**	**4**	**5**	**6**
Advertising(X)	**10**	**12**	**15**	**20**	**25**	**30**
Sales(Y)	**40**	**50**	**55**	**65**	**80**	**90**

(a) Calculate Karl Pearson's correlation coefficient.
(b) Determine the regression equation of sales on advertising.
(c) Predict expected sales if advertising is increased to Rupees 18,000

17. A quality manager knows that 90% of the manufacture's parts are defect-free
a) What is the probability that exactly 8 out of 10 randomly selected parts will be defect free?
b) of a part's lifetime in months is normally distributed with mean 24 and standard deviation 4. What is the probability that a randomly chosen part will last between 22 and 28 months?

18. The weight distribution of 60 parcels is:

Weight(kg)	0-5	5-10	10-15	15-20	20-25
Frequency	10	15	20	10	5

(a) Construct less than and more than cumulative frequencies.
(b) Draw both ogives and find the median weight.

19. Classify Quantitative Techniques. And explain

20. Calculate Karl Pearson's coefficient of skewness for the following data of section A and section B obtained from marks of students. Which distribution is more skewed?

Section	Mean	Standard Deviation	Mode
A	46.83	14.8	51.67
B	47.83	14.8	47.07

21. The table below shows the prices and quantities of five different commodities in the base year 2020 and the current year 2025:

Commodity	Price in 2020(in Rupees)	Quantity in 2020	Price in 2025(in Rupees)	Quantity in 2025

A	45	80	55	90
B	25	120	30	130
C	30	100	35	95
D	50	60	60	65
E	20	150	22	140

Calculate the Paasche Price Index for the year 2025, taking 2020 as the base year. Also, discuss briefly why Paasche's index might underestimate inflation in some cases.

22. The following table shows the number of goals scored by a football team in 15 consecutive matches:

Match Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Goals scored	2	1	2	3	4	0	5	2	3	2	1	4	3	2	6

(a) Calculate the mean, median and mode of the goals scored in these matches.

(b) If the 6 goals match is considered an outlier, recalculate the mean and comment on its effect on central tendency.

(c) Which measure best represents the typical performance of the team?

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