

Roll. No.

O.M.R. Serial No.

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Question Booklet Number

MBA (SEMESTER-I) EXAMINATION- JULY, 2026

(ODL)

QUANTITATIVE TECHNIQUES

Paper Code

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**Question Booklet
Series**

A

Time : 2 : 00 Hours

Max. Marks : 75

Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.
2. The booklet contains 100 questions. Examinee is required to answer any 75 questions in the OMR Answer-Sheet provided and not in the question booklet. All questions carry equal marks.
3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.
4. Four alternative answers are mentioned for each question as - A, B, C & D in the booklet. The candidate has to choose the correct / answer and mark the same in the OMR Answer-Sheet as per the direction :

(Remaining instructions on last page)

परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।
2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को किन्हीं 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। सभी प्रश्नों के अंक समान हैं।
3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, उसे तुरन्त बदल लें।
4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर- A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से सही उत्तर छोटना है। उत्तर को OMR उत्तर-पत्रक में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

(शेष निर्देश अन्तिम पृष्ठ पर)

1. What is the main purpose of statistics for managers?
 - (A) To help in decision-making under uncertainty
 - (B) To collect random numbers
 - (C) To write reports
 - (D) To design questionnaires
2. Which type of data represents categories like "Male" or "Female"?
 - (A) Numerical data
 - (B) Categorical data
 - (C) Discrete data
 - (D) Continuous data
3. Probability of an event always lies between:
 - (A) -1 and 0
 - (B) 0 and 1
 - (C) $-\infty$ and $+\infty$
 - (D) 1 and 100
4. If two events cannot occur at the same time, they are called:
 - (A) Independent events
 - (B) Dependent events
 - (C) Mutually exclusive events
 - (D) Complementary events
5. Bayes' Theorem is used to:
 - (A) Find the mean of data
 - (B) Calculate updated probability using prior information
 - (C) Find median of data
 - (D) Calculate correlation
6. Which distribution is used for counting the number of successes in a fixed number of independent trials?
 - (A) Poisson distribution
 - (B) Normal distribution
 - (C) Binomial distribution
 - (D) Exponential distribution
7. The shape of a normal probability curve is:
 - (A) Skewed left
 - (B) Skewed right
 - (C) U-shaped
 - (D) Bell-shaped
8. If events A and B are independent, then $P(A \text{ and } B)$ equals:
 - (A) $P(A) + P(B)$
 - (B) $P(A) \times P(B)$
 - (C) $P(A) / P(B)$
 - (D) $P(A) - P(B)$

9. Poisson distribution is used when:
- (A) Number of trials is infinite and probability of success is very small
 - (B) Sample size is small
 - (C) Data is categorical
 - (D) Variables are dependent
10. "Departures from normality" means:
- (A) Data is perfectly normal
 - (B) Data is not following a normal distribution
 - (C) Mean equals median
 - (D) Standard deviation is zero
11. Which of the following is an example of numerical data?
- (A) Colors of cars
 - (B) Student roll numbers
 - (C) Heights of students
 - (D) Blood groups
12. The sum of probabilities of all possible outcomes in a sample space is:
- (A) 0
 - (B) 0.5
 - (C) 1
 - (D) 100
13. If $P(A)=0.3$ and $P(B)=0.4$, and A and B are independent, then $P(A \text{ and } B)$ is:
- (A) 0.7
 - (B) 0.12
 - (C) 0.1
 - (D) 0.58
14. Which probability distribution is continuous?
- (A) Binomial
 - (B) Poisson
 - (C) Normal
 - (D) All of these
15. Statistical thinking emphasizes:
- (A) Ignoring data variation
 - (B) Understanding and reducing variation in processes
 - (C) Only calculating averages
 - (D) Using only graph
16. A matrix with the same number of rows and columns is called:
- (A) Row matrix
 - (B) Column matrix
 - (C) Square matrix
 - (D) Zero matrix

17. Matrix addition is possible only when matrices have:
- (A) Same number of rows only
 - (B) Same number of columns only
 - (C) Determinant non-zero
 - (D) Same order (same rows and same columns)
18. If $A = \begin{bmatrix} 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 3 \end{bmatrix}$, then $A + B$ equals:
- (A) $\begin{bmatrix} 3 & 7 \end{bmatrix}$
 - (B) $\begin{bmatrix} 1 & 1 \end{bmatrix}$
 - (C) $\begin{bmatrix} 2 & 12 \end{bmatrix}$
 - (D) $\begin{bmatrix} 3 & 5 \end{bmatrix}$
19. For matrix multiplication, the number of columns in the first matrix must equal:
- (A) Number of rows in second matrix
 - (B) Number of columns in second matrix
 - (C) Number of rows in first matrix
 - (D) Determinant of second matrix
20. The inverse of a matrix exists only if the matrix is:
- (A) Singular
 - (B) Non-singular (determinant $\neq 0$)
 - (C) Rectangular
 - (D) Symmetric
21. The adjoint of a 2×2 matrix $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ is:
- (A) $\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$
 - (B) $\begin{bmatrix} a & c \\ b & d \end{bmatrix}$
 - (C) $\begin{bmatrix} -a & b \\ c & -d \end{bmatrix}$
 - (D) $\begin{bmatrix} d & b \\ c & a \end{bmatrix}$
22. Solving linear equations using matrix method involves:
- (A) Only addition
 - (B) Inverse matrix multiplication
 - (C) Only subtraction
 - (D) Finding mode
23. Which matrix has all elements zero?
- (A) Identity matrix
 - (B) Scalar matrix
 - (C) Diagonal matrix
 - (D) Null matrix
24. In business, matrices can be used to:
- (A) Calculate mean
 - (B) Model input-output relationships
 - (C) Find median
 - (D) Draw pie charts
25. If $A = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$ then determinant of A :
- (A) -2
 - (B) 2
 - (C) 10
 - (D) -1

26. Identity matrix is always:
- (A) Rectangular
 - (B) Square with ones on diagonal and zeros elsewhere
 - (C) Singular
 - (D) Null matrix
27. Multiplication of a matrix by a scalar means:
- (A) Adding same number to each element
 - (B) Multiplying each element by that scalar
 - (C) Finding determinant
 - (D) Transposing the matrix
28. Which operation is not valid for matrices of different orders?
- (A) Addition
 - (B) Subtraction
 - (C) Multiplication by scalar
 - (D) Transpose
29. Transpose of a matrix is obtained by:
- (A) Interchanging rows and columns
 - (B) Multiplying all elements by 2
 - (C) Removing first row
 - (D) Adding row to column
30. A business application of inverse matrix is:
- (A) Finding average sales
 - (B) Solving system of linear equations for cost and revenue
 - (C) Drawing histogram
 - (D) Calculating mode
31. Which measure of central tendency is affected most by extreme values?
- (A) Median
 - (B) Mode
 - (C) Arithmetic mean
 - (D) Geometric mean
32. The median of the data 5, 7, 9, 11, 13 is :
- (A) 7
 - (B) 9
 - (C) 11
 - (D) 8
33. Weighted mean is used when:
- (A) All values have equal importance
 - (B) Some values have more importance than others
 - (C) Data is categorical
 - (D) There is no data

34. Geometric mean is suitable for calculating:
- (A) Average of ratios or growth rates
 - (B) Most frequent value
 - (C) Middle value
 - (D) Difference between numbers
35. Quartiles divide the data into how many equal parts?
- (A) 2
 - (B) 4
 - (C) 10
 - (D) 100
36. The relationship between mean, median, and mode in a moderately skewed distribution is:
- (A) Mode = 3 Median – 2 Mean
 - (B) Mean = 3 Median – 2 Mode
 - (C) Median = 3 Mode – 2 Mean
 - (D) Mode = 2 Mean – 3 Median
37. Harmonic mean is the reciprocal of:
- (A) Arithmetic mean of reciprocals
 - (B) Median of reciprocals
 - (C) Mode of reciprocals
 - (D) Geometric mean
38. Deciles divide data into:
- (A) 4 parts
 - (B) 10 parts
 - (C) 100 parts
 - (D) 2 parts
39. Percentiles are useful for:
- (A) Finding rank of a value in data
 - (B) Calculating mean
 - (C) Finding mode
 - (D) Matrix multiplication
40. The arithmetic mean of 10, 20, 30 is:
- (A) 60
 - (B) 30
 - (C) 10
 - (D) 20
41. Which average is always less than or equal to geometric mean?
- (A) Arithmetic mean
 - (B) Harmonic mean
 - (C) Median
 - (D) Mode
42. Mode of the data 2, 3, 2, 5, 6, 2, 7 is:
- (A) 2
 - (B) 5
 - (C) 6
 - (D) 7
43. For symmetrical distribution, mean, median, and mode are :
- (A) Equal
 - (B) Not equal
 - (C) Mode > Mean
 - (D) Median > Mean

44. The second quartile is equal to:
- (A) Mean
 - (B) Mode
 - (C) Median
 - (D) Harmonic mean
45. Weighted mean formula is:
- (A) $\Sigma(wx) / \Sigma w$
 - (B) $\Sigma x / n$
 - (C) Product of $x^{(1/n)}$
 - (D) $n / \Sigma(1/x)$
46. Null hypothesis is denoted by:
- (A) H_1
 - (B) H_0
 - (C) μ
 - (D) σ
47. Standard error of mean measures:
- (A) Central tendency
 - (B) Sampling variability of sample mean
 - (C) Population mode
 - (D) Correlation
48. Student's t-test is used when sample size is:
- (A) Large ($n > 30$)
 - (B) Small ($n \leq 30$) and population standard deviation unknown
 - (C) Always
 - (D) For categorical data only
49. Chi-square (χ^2) test is mainly used for:
- (A) Testing independence of categorical variables
 - (B) Calculating mean
 - (C) Finding median
 - (D) Matrix inverse
50. Karl Pearson's correlation coefficient measures:
- (A) Causal relationship
 - (B) Linear relationship between two variables
 - (C) Difference between means
 - (D) Rank order
51. Spearman's rank correlation is based on:
- (A) Actual values
 - (B) Frequencies
 - (C) Ranks of data
 - (D) Standard deviations
52. Regression line is used for:
- (A) Classification
 - (B) Prediction of one variable from another
 - (C) Matrix multiplication
 - (D) Finding mode
53. If correlation coefficient $r = +1$, then relationship is:
- (A) Perfect negative
 - (B) Perfect positive
 - (C) No correlation
 - (D) Weak positive

54. Confidence limits give:
- (A) Exact population mean
 - (B) P-value
 - (C) Sample size
 - (D) Range within which population parameter is likely to lie
55. A p-value less than 0.05 generally means:
- (A) Accept null hypothesis
 - (B) Reject null hypothesis (significant result)
 - (C) Test is invalid
 - (D) Sample is biased
56. In simple linear regression, $Y = a + bX$, b is called:
- (A) Intercept
 - (B) Slope
 - (C) Correlation coefficient
 - (D) Standard deviation
57. Multiple regression has:
- (A) One dependent and more than one independent variable
 - (B) One dependent and one independent variable
 - (C) Only independent variables
 - (D) No dependent variable
58. Type I error is:
- (A) Accepting true null hypothesis
 - (B) Rejecting true null hypothesis
 - (C) Accepting false null hypothesis
 - (D) Rejecting false null hypothesis
59. Which correlation method is suitable for ordinal data?
- (A) Karl Pearson
 - (B) Spearman's rank
 - (C) Regression
 - (D) Chi-square for mean
60. If two variables move in opposite directions, correlation is:
- (A) Positive
 - (B) Negative
 - (C) Zero
 - (D) Infinite
61. A manager observes that sales increase whenever advertising spend increases. This is an example of:
- (A) Association between variables
 - (B) Categorical data analysis
 - (C) Statistical independence
 - (D) Bayes' theorem

62. If two events are dependent, knowing that one event occurred will:
- (A) Not affect the probability of the other
 - (B) Change the probability of the other
 - (C) Make the other event impossible
 - (D) Make the sum of probabilities zero
63. A company wants to update the probability of a machine being faulty after receiving a test report. Which method should be used?
- (A) Binomial distribution
 - (B) Poisson distribution
 - (C) Bayes' theorem
 - (D) Normal distribution
64. If a dataset follows a normal distribution, most of the data lies within:
- (A) One standard deviation of mean
 - (B) Two standard deviations of mean
 - (C) Three standard deviations of mean
 - (D) Exactly at the mean
65. A bank finds that customer complaints come randomly at an average rate of 3 per hour. Which model is most appropriate?
- (A) Binomial model
 - (B) Poisson model
 - (C) Normal model
 - (D) Uniform model
66. A quality inspector checks 10 randomly selected items from a batch. Each item is either defective or not. This situation best fits:
- (A) Normal distribution
 - (B) Poisson distribution
 - (C) Binomial distribution
 - (D) Chi-square distribution
67. If the probability of rain is 0.3 and probability of traffic jam is 0.4, and both are independent, the probability of rain OR traffic jam is:
- (A) 0.12
 - (B) 0.58
 - (C) 0.70
 - (D) 0.82
68. When a distribution has a long tail on the right side, it is called:
- (A) Negatively skewed
 - (B) Positively skewed
 - (C) Symmetrical
 - (D) Normal
69. A marketing manager wants to understand the relationship between customer age and product preference. This is an example of:
- (A) Statistical thinking about association
 - (B) Calculating mean
 - (C) Finding median
 - (D) Applying Bayes' rule

70. If the probability of success in a trial is very small but number of trials is very large, the best approximation is:
- (A) Binomial by Poisson
 - (B) Normal by Binomial
 - (C) Poisson by Normal
 - (D) Uniform by Exponential
71. A business has two products and two raw materials. The input-output relationship is best represented by:
- (A) A scalar
 - (B) A matrix
 - (C) A percentage
 - (D) A single equation
72. If the determinant of a matrix is zero, solving linear equations using the inverse method is:
- (A) Possible with unique solution
 - (B) Not possible because inverse does not exist
 - (C) Easier than usual
 - (D) Always gives infinite solutions
73. Two matrices A and B can be multiplied. After multiplication, the result will have rows equal to:
- (A) Rows of A
 - (B) Columns of A
 - (C) Rows of B
 - (D) Columns of B
74. In business, if cost matrix and quantity matrix are given, total cost is obtained by:
- (A) Adding the matrices
 - (B) Subtracting the matrices
 - (C) Multiplying the matrices appropriately
 - (D) Finding determinant
75. A company has three factories and four warehouses. The transportation cost matrix will have dimensions:
- (A) 3×4
 - (B) 4×3
 - (C) 3×3
 - (D) 4×4
76. If $A = \begin{bmatrix} 2 & 1 \\ 0 & 3 \end{bmatrix}$ the element at row 2, column 1 is:
- (A) 2
 - (B) 1
 - (C) 0
 - (D) 3
77. To find unknown prices given total revenue and quantities sold, which matrix operation is needed?
- (A) Addition of matrices
 - (B) Subtraction of matrices
 - (C) Finding inverse and multiplying
 - (D) Transpose only

78. If a matrix is multiplied by its inverse, the result is:
- (A) Null matrix
 - (B) Identity matrix
 - (C) Original matrix
 - (D) Transpose matrix
79. A symmetric matrix is one where:
- (A) $A = -A^T$
 - (B) $A = A^T$
 - (C) All elements are zero
 - (D) Only diagonal elements are non-zero
80. In solving two linear equations using matrices, if the coefficient matrix is singular, the system may have:
- (A) Unique solution only
 - (B) Determinant equal to 1
 - (C) Exactly two solutions
 - (D) No solution or infinite solutions
81. A teacher wants to give more weight to final exam scores than to assignments. Which average should be used?
- (A) Simple arithmetic mean
 - (B) Weighted arithmetic mean
 - (C) Geometric mean
 - (D) Harmonic mean
82. If a dataset has extreme outliers, which measure of central tendency best represents the data?
- (A) Median
 - (B) Arithmetic mean
 - (C) Harmonic mean
 - (D) Weighted mean
83. A company wants to calculate average growth rate of sales over 5 years. Which average is most appropriate?
- (A) Arithmetic mean
 - (B) Geometric mean
 - (C) Harmonic mean
 - (D) Median
84. If most students score low marks and very few score high, the distribution is:
- (A) Symmetrical
 - (B) Positively skewed
 - (C) Negatively skewed
 - (D) Normal
85. A human resources manager wants to find the most common salary among employees. Which measure should be used?
- (A) Mean
 - (B) Median
 - (C) Mode
 - (D) Quartile

86. The 90th percentile of test scores means:
- (A) 90% of students scored above this mark
 - (B) 90% of students scored below this mark
 - (C) 10% of students scored below this mark
 - (D) All students scored exactly this mark
87. To compare variability of two datasets with different units, which measure is used?
- (A) Range
 - (B) Standard deviation
 - (C) Coefficient of variation
 - (D) Mean deviation
88. In a moderately skewed distribution, median is 50 and mean is 55. The mode is approximately:
- (A) 40
 - (B) 45
 - (C) 50
 - (D) 60
89. A small e-commerce company wants average order value but large orders should not dominate. Better to use:
- (A) Mean
 - (B) Median
 - (C) Mode
 - (D) Weighted mean with small weights
90. For calculating average speed when equal distances are traveled at different speeds, use:
- (A) Arithmetic mean
 - (B) Geometric mean
 - (C) Harmonic mean
 - (D) Median
91. A researcher wants to test if a new teaching method improves scores compared to the old method. The null hypothesis should state:
- (A) New method is better
 - (B) No difference between methods
 - (C) Old method is better
 - (D) Both methods are equally bad
92. If the calculated t-value is greater than the critical t-value, the researcher should:
- (A) Accept null hypothesis
 - (B) Reject null hypothesis
 - (C) Increase sample size
 - (D) Change the test

93. A company wants to know if gender (male/female) is related to product preference (three categories). Which test is appropriate?
- (A) t-test
 - (B) Chi-square test of independence
 - (C) Pearson correlation
 - (D) Spearman's rank correlation
94. If two variables have correlation coefficient zero, it means:
- (A) No linear relationship exists
 - (B) No relationship of any kind exists
 - (C) Variables are perfectly related
 - (D) One variable causes the other
95. A manager predicts sales using advertising spend. Here, sales is the:
- (A) Independent variable
 - (B) Dependent variable
 - (C) Slope
 - (D) Intercept
96. If regression slope is negative, then:
- (A) As X increases, Y increases
 - (B) No change in Y
 - (C) As X increases, Y decreases
 - (D) X and Y are unrelated
97. To compare the average test scores of two small classes ($n=15$ each), use:
- (A) Chi-square test
 - (B) t-test for independent samples
 - (C) Pearson correlation
 - (D) Spearman's rank correlation
98. If ranks are given instead of actual numbers, which correlation is best?
- (A) Karl Pearson
 - (B) Spearman's rank
 - (C) Regression
 - (D) Chi-square
99. A 95% confidence interval for mean sales is (100, 120). This means:
- (A) Probability that mean lies in this interval is 0.95
 - (B) In repeated sampling, 95% of such intervals will contain true mean
 - (C) Sample mean is exactly 110
 - (D) Population mean is outside the interval
100. In hypothesis testing, increasing sample size generally:
- (A) Increases Type I error
 - (B) Decreases standard error
 - (C) Decreases test power
 - (D) Makes null hypothesis always true

Rough Work

Example :

Question :

Q.1 (A) ● (C) (D)

Q.2 (A) (B) ● (D)

Q.3 (A) ● (C) (D)

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.
6. All answers are to be given on OMR Answer Sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.
7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.
8. After the completion of the examination, candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.
9. There will be no negative marking.
10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.
11. To bring and use of log-book, calculator, pager & cellular phone in examination hall is prohibited.
12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

Impt. On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is any discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

उदाहरण :

प्रश्न :

प्रश्न 1 (A) ● (C) (D)

प्रश्न 2 (A) (B) ● (D)

प्रश्न 3 (A) ● (C) (D)

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
6. सभी उत्तर केवल ओ०एम०आर० उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
7. ओ०एम०आर० उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।
8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।
9. निगेटिव मार्किंग नहीं है।
10. कोई भी रफ कार्य, प्रश्न-पुस्तिका में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।
11. परीक्षा-कक्ष में लॉग-बुक, कैल्कुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।
12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

महत्वपूर्ण: प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।