## CBCS <br> COMMERCE <br> FOURTH SEMESTER <br> BCOM/4/EC/14 :QUANTITATIVE TECHNIQUE

## I. Choose the correct answer

## Unit - 1

1. Statistics can be best considered as
(a) an art
(b) science
(c) both art as well as science
(d) art and philosophy
2. The mid point of a class is obtained by
(a) adding upper and lower limit
(b) deducting upper limit from the lower limit
(c) dividing the diference of upper and lower limit by 2
(d) ading upper and lower limit and dividing by 2
3. In inclusive class intervals of frequency distribution
(a) upper limit of each class interval in excluded
(b) lower limit of each class interval is excluded
(c) both (a) and (b)
(d) None
4. The algebraic sum of the deviations of a set of a $n$ values from their arithmetic mean is
(a) n
(b) 0
(c) 1
(d) -1
5. In a series of values if one value is zero, the geometric mean is
(a) 0
(b) 1
(c) between -1 and +1
(d) indeterminate
6. The measuresofvariation that is least affected by extreme observation is
(a) range
(b) mean deviation
(c) standard deviation
(d) Quartile deviation
7. Standard deviation is
(a) absolute measure
(b) relative measure
(c) both
(d) none
8. Coefficient of variation is a relative measure of
(a) mean
(b) standard deviation
(c) range
(d) dispersion
9. In a business house, statistics decreases the:
(a) risk
(b) uncertainty
(c) profit
(d) sales
10. Cartograph is a:
(a) line diagram
(b) bar diagram
(c) map
(d) circle
11. Statistical results are all the time:
(a) qualitative one
(b) an average
(c) an exact result
(d) an isolated number
12. Economics cannot be a successful subject without:
(a) business
(b) commerce
(c) statistics
(d) management
13. The arithmetic mean between $5+\sqrt{3}$ and $5-\sqrt{3}$ is:
(a) 3
(b) $\sqrt{3}$
(c) 5
(d) $\sqrt{5}$
14. The geometric mean of two numbers is 16 . If one number is 32 , the other number is:
(a) 4
(b) 6
(c) 8
(d) 10
15. The harmonic mean of 4 and 6 is:
(a) 4.5
(b) 4.8
(c) 5
(d) 5.5
16. Difference between highest and lowest value called:
(a) standard deviation
(b) Mean Deviation
(c) Quartile Deviation
(d) Range
17. Statistics deals only with
(a) quantitative characteristics
(b) qualitative characteristics
(c) both (a) and (b)
(d) none of the above
18. Open-end classes are those in which
(a) lower limit of the first class and the upper limit of the last class are known
(a) lower limit of the first class and the upper limit of the last class are not known
(c) only lower limit of the first class are known
(d) none of the above
19. Relationship of mean, median and mode according to Karl Pearson is
(a) mode $=2$ median -3 mean
(b) median $=2$ mode -2 mean
(c) mode $=3$ median -2 mean
(d) none of the above
20. The sum of the squares of the deviations of the values of a variable is least when the deviations are measured from
(a) harmonic mean
(b) geometric mean
(c) arithmetic mean
(d) none of the above
21. Mean deviation is
(a) a relative measures
(b) an absolute measures
(c) both (a) and (b)
(d) none of the above
22. Interquartile range is the difference between
(a) the highest value and the lowest value
(b) median and mean
(c) the third quartile and the first quartile
(d) none of the above
23. The measures of dispersion can never be
(a) positive
(b) negative
(c) zero
(d) none of the above
24. Which of the following is least when deviations are taken from the median
(a) range
(b) quartile deviation
(c) mean deviation
(d) standard deviation
25. Which average is affected most by extreme observation?
(a) Mode
(b) Median
(c) Geometric mean
(d) None of the above
26. A geometric mean of two numbers 12 and 27 is
(a) 9
(b) 12
(c) 18
(d) 21
27. The positional measure of central tendency is
(a) Geometric mean
(b) Median
(c) Arithmetic mean
(d) None of the above
28. Statistics can be best considered as
(a) An art
(b) Science
(c) Both art as well as science
(d) None of the above
29. The total of all the observations divided by the number of observations is called
(a) Arithmetic mean
(b) Geometric mean
(c) Median
(d) Harmonic mean
30. Lowest value of variance can be
(a) 1
(b) -1
(c) 2
(d) 0
31. Standard deviation is always calculated from
(a) Mean
(b) Median
(c) Mode
(d) Geometric mean
32. The standard deviation and variance are $\qquad$ of origin?
(a) Multiplied
(b) Variance
(c) Independent
(d) None of the above
33. Statistics can be best considered as:
(a) a science
(b) an art
(c) both science as well as art
(d) neither science nor art
34. Statistics is helpful in:
(a) formulating and testing hypothesis
(b) prediction
(c) formulation of suitable policies
(d) all of the above
35. A set of vertical bars whose areas are proportional to the frequencies represented is known as:
(a) Histogram
(b) Frequency polygon
(c) Ogive
(d) none of the above
36. The value in a series of observations which occurs with the greatest frequency is called:
(a) median
(b) mean deviation
(c) standard deviation
(d) mode
37. What is the median of the sample $5,5,11,9,8,5,8$ ?
(a) 5
(b) 6
(c) 8
(d) 9
38. Karl Pearson has expressed the relationship between Mean, Median, and Mode as:
(a) Mode $=$ Mean -3 [Mean - Median]
(b) Mode $=3$ Median -2 Mean
(c) Median $=$ Mode $+2 / 3$ [Mean - Mode $]$
(d) All of the above
39. The average difference between the items in a distribution and the median or mean of that series is known as:
(a) Range
(b) Mean deviation
(c) Inter-quartile range
(d) Standard deviation
40. If all the scores on examination cluster around the mean, the dispersion is said to be:
(a) Small
(b) Large
(c) Normal
(d) Symmetrical

## Unit- 2

41. If two events cannot occur simultaneously at the same trial then they are
(a) dependent events
(b) independent events
(c) mutually exclusive events
(d) simple events
42. If two events A and B are independent, the probability that they will both occur is given by
(a) $\mathrm{P}(\mathrm{A})+\mathrm{P}(\mathrm{B})$
(b) $P(A) \times P(B)$
(c) $\mathrm{P}(\mathrm{A})-\mathrm{P}(\mathrm{B})$
(d) $\mathrm{P}(\mathrm{A})+\mathrm{P}(\mathrm{B})-\mathrm{P}(\mathrm{AB})$
43. Those in which the occurence or non occurence of an event in any one trial affects the probability of other event in other trial. This is known as
(a) dependent event
(b) independent event
(c) complementary event
(d) exhaustive event
44. If the probability of drawing a spade from a well shuffled pack of playing card is $\frac{1}{4}$ then the probability that of the card drawn from a well shuffled pack of playing card is 'not a spade' is
(a) 1
(b) $\frac{1}{2}$
(c) $\frac{1}{4}$
(d) $\frac{3}{4}$
45. The probability that a card drawn at random from the pack of playing cards may be either a queen or an ace is
(a) $2 / 13$
(b) $11 / 13$
(c) $9 / 13$
(d) $2 / 52$
46. If both the variables are varying in the same direction, the correlation is said to be
(a) partial correlation
(b) simple correlation
(c) positive correalation
(d) negative correlation
47. The coefficient of correlation
(a) has no limit
(b) should be less than 1
(c) should be more than 1
(d) varies between -1 and +1
48. Coefficient of determination is defined as
(a) $r^{3}$
(b) $r^{2}$
(c) $1-r^{2}$
(d) $1+r^{2}$
49. In a box, there are 8 red, 7 blue and 6 green balls. One ball is picked up randomly. What is the probability that it is neither red nor green?
(a) $1 / 3$
(b) $3 / 4$
(c) $7 / 19$
(d) $9 / 21$
50. Probability sampling and random sampling are
(a) Anonymous
(b) Different terms
(c) Synonymous
(d) None of the above
51. Coefficient of correlation will be always
(a) More than 0
(b) More than -1
(c) Less than - 1
(d) Between -1 and +1
52. We can measure the cause and effect relationship by the help of
(a) Time series analysis
(b) Cross-sectional analysis
(c) Correlation analysis
(d) Regression analysis
53. The total events to throw three dice simultaneously is
(a) 6
(b) 18
(c) 21
(d) 216
54. Which of the following cannot be the probability of an event?
(a) 1.5
(b) $3 / 5$
(c) $25 \%$
(d) 0.3
55. When the two regression lines are parallel to each other, then their slopes are
(a) Zero
(b) Different
(c) Same
(d) Positive
56. In scatter diagram, if most of the points lie in the first and third quadrants, then coefficient of correlation is:
(a) Negative
(b) Positive
(c) Zero
(d) All the above
57. What is the probability of having 53 Mondays in a non-leap year?
(a) $\frac{6}{7}$
(b) $\frac{1}{7}$
(c) $\frac{1}{365}$
(d) $\frac{53}{365}$
58. A card numbered 1 to 20 are mixed up and a card is drawn at random. What is the probability that the card drawn has a number which is a multiple of 3 or 5 ?
(a) $\frac{1}{2}$
(b) $\frac{6}{20}$
(c) $\frac{4}{20}$
(d) $\frac{9}{20}$
59. A dice is thrown. Find the probability of getting an even number?
(a) $\frac{2}{3}$
(b) 1
(c) $\frac{5}{6}$
(d) $\frac{1}{2}$
60. When events cannot happen together in a single trial, they are called
(a) Independent events
(b) Mutually exclusive events
(c) Dependent events
(d) Impossible events
61. Rank correlation coefficient is also known as
(a) Pearsonian Correlation Coefficient
(b) Pearson's Correlation Coefficient
(c) Random Correlation Coefficient
(d) Spearman's Correlation Coefficient
62. Correlation does not imply
(a) negative correlation
(b) cause-effect relationship
(c) relativity
(d) correction relationship
63. The value of the correlation coefficient ranges from
(a) 0 to 1
(b) -1 to 0
(c) -1 to 1
(d) 0 to 10
64. The regression lines cut each other at the point of
(a) average of X and Y
(b) average of X only
(c) the median of X and Y
(d) None of the above
65. If both the variables are varying in the same direction, the correlation is said to be
(a) Positive correlation
(b) Negative correlation
(c) Partial correlation
(d) None of the above
66. When two events cannot occur simultaneously in a single trial it is called
(a) Mutually exclusive events
(b) Collectively exclusive events
(c) Mutually exhaustive events
(d) None of the above
67. When the outcome of one event does not affect the outcome of the other it is said to be
(a) Dependent event
(b) Independent event
(c) Mutually exclusive event
(d) Equally likely events
68. When the outcome of one event affects the outcome of the other it is said to be
(a) Equally likely events
(b) Mutually exclusive events
(c) Independent event
(d) Dependent event
69. A box contains 8 red, 7 blue and 6 green balls. One ball is picked up randomly. What is the probability that it is neither red nor green?
(a) $\frac{1}{3}$
(b) $\frac{3}{4}$
(c) 0
(d) None of the above
70. The geometric mean of the two regression coefficient $\beta Y X$ and $\beta X Y$ is equal to:
(a) $r^{2}$
(b) $r$
(c) $r^{3}$
(d) 0
71. Regression coefficient is independent of
(a) Origin
(b) Scale
(c) Both origin and scale
(d) None of the above
72. The slope of regression line of $Y$ on $X$ is also called the
(a) Correlation coefficient of Y on X
(b) Correlation coefficient of X on Y
(c) Regression coefficient of $X$ on $Y$
(d) Regression coefficient of Y on X
73. Two events that cannot be happened simultaneously is known as:
(a) Exhaustive events
(b) Independent events
(c) Mutually exclusive events
(d) none of the above
74. If two events A and B are mutually exclusive the probability of the occurrence of either A or B is the sum individual probability of A and B . This theorem is called:
(a) Multiplication theorem
(b) Addition theorem
(c) Classical probability
(d) Subtraction theorem
75. One card is drawn from a standard pack of 52 . What is the probability that the card drawn is a king?
(a) $4 / 52$
(b) $1 / 4$
(c) $1 / 52$
(d) $52 / 4$
76. A dice is thrown. Find the probability of getting an even number?
(a) $2 / 6$
(b) $3 / 6$
(c) $4 / 6$
(d) $5 / 6$
77. If both variables are varying in the opposite direction, it is called:
(a) Partial correlation
(b) Positive correlation
(c) High degree of correlation
(d) Negative correlation
78. In perfect positive correlation:
(a) $r=0$
(b) $r=-1$
(c) $\mathrm{r}=+1$
(d) $\mathrm{r}=+/-1$
79. In regression analysis, the variable that is being predicted is the
(a) explained or dependentvariable
(b) independent variable
(c) intervening variable
(d) is usually x
80. The coefficient of correlation
(a) is the square of the coefficient of determination
(b) is the square root of the coefficient of determination
(c) is the same as r -square
(d) can never be negative

## Unit-3

81. The total current year prices for the various commodities in question is divided by the total of base year prices and the quotient is multiplied under
(a) simple aggregative method
(b) simple average of relative method
(c) weighted aggregative method
(d) Laspeyres' methos
82. Fishers' index number is
(a) The median of Laspeyres' and Paasches' index
(b) The arithmetic mean of Laspeyres' and Paasches' index
(c) The geometric mean of Laspeyres and Paasches' index
(d) The harmonic mean of Laspeyres' and Paasches' index
83. Symbolically time reversal test is given as
(a) $\mathrm{P}_{\mathrm{o} 1} \times \mathrm{P}_{10}$
(b) $\mathrm{P}_{01} \times \mathrm{P}_{10}=1$
(c) $\mathrm{P}_{01} \times \mathrm{P}_{10} \neq 1$
(d) $\mathrm{P}_{\mathrm{o} 1} \times \mathrm{P}_{10}=\frac{\sum \mathrm{p}_{1} \mathrm{q}_{1}}{\sum \mathrm{p}_{\mathrm{o}} \mathrm{q}_{\mathrm{o}}}$
84. The technique of changing the given base period of a series of index numbers and recasting them to form a new series with reference to a new base period is known as
(a) splicing
(b) deflating
(c) base shifting
(d) cost of living index
85. A component of time series used for short term forecast is
(a) trend
(b) seasonal
(c) cyclical
(d) irregular
86. A forecast that projects company's sale is the
(a) economic forecast
(b) technological forecast
(c) demand forecast
(d) financial forecast
87. The sales of wool and umbrella are associated with the components of which of the time series
(a) seculaar trend
(b) seasonal variation
(c) irregular vatiation
(d) cyclical variation
88. If the slope of the trend line is positive, it shows
(a) rising trend
(b) dclining trend
(c) stagnation
(d) uncontrollable
89. Index numbers are expressed in:
(a) Ratios
(b) Squares
(c) Percentages
(d) Combinations
90. Index for base period is always taken as:
(a) 100
(b) One
(c) 200
(d) Zero
91. Another name of consumer's price index number is:
(a) Whole-sale price index number
(b) Cost of living index
(c) Sensitive
(d) Composite
92. Laspeyre's index $=110$, Paasche's index $=108$, then Fisher's Ideal index is equal to:
(a) 110
(b) 108
(c) 100
(d) 109
93. An orderly set of data arranged in accordance with their time of occurrence is called:
(a) Arithmetic series
(b) Harmonic series
(c) Geometric series
(d) Time series
94. Increase in the number of patients in the hospital due to heat stroke is:
(a) Secular trend
(b) Irregular variation
(c) Seasonal variation
(d) Cyclical variation
95. In time series seasonal variations can occur within a period of:
(a) Four years
(b) Three years
(c) Two years
(d) One year
96. In a straight line equation $Y=a+b X ; b$ is the:
(a) Y-intercept
(b) Slope
(c) X-intercept
(d) Trend
97. In business and economics, index numbers can be classified as
(a) price index numbers
(b) quantity index numbers
(c) value index numbers
(d) All of the above
98. $\qquad$ ignore(s) the relative importance of the commodities being measured.
(a) Simple Aggregative Method
(b) Weighted Aggregative Method
(c) Neither methods
(d) Both methods
99. Paasche price index in calculated as
(a) $\mathrm{P}_{01}=\frac{\Sigma \mathrm{p}_{1} \mathrm{q}_{1}}{\Sigma \mathrm{p}_{\mathrm{o}} \mathrm{q}_{1}} \times 100$
(b) $\mathrm{P}_{10}=\frac{\Sigma \mathrm{p}_{1} \mathrm{q}_{1}}{\Sigma \mathrm{p}_{0} \mathrm{q}_{1}} \times 100$
(c) $\mathrm{P}_{01}=\frac{\Sigma \mathrm{p}_{0} \mathrm{q}_{1}}{\Sigma \mathrm{p}_{0} \mathrm{q}_{1}} \times 100$
(d) $\mathrm{P}_{01}=\frac{\Sigma \mathrm{p}_{1} \mathrm{q}_{1}}{\sum \mathrm{p}_{1} \mathrm{q}_{1}} \times 100$
100. Marshall- Edgeworth Method calculates price index numbers as
(a) $\mathrm{P}_{01}=\frac{\sum \mathrm{p}_{1} \mathrm{q}_{0}+\sum \mathrm{p}_{1} \mathrm{q}_{1}}{\sum \mathrm{p}_{0} \mathrm{q}_{1}+\sum \mathrm{p}_{0} \mathrm{q}_{1}} \times 100$
(b) $\mathrm{P}_{01}=\frac{\sum \mathrm{p}_{1} \mathrm{q}_{0}+\sum \mathrm{p}_{1} \mathrm{q}_{1}}{\sum \mathrm{p}_{0} \mathrm{q}_{0}+\sum \mathrm{p}_{0} \mathrm{q}_{1}} \times 100$
(c) $\mathrm{P}_{01}=\frac{\sum \mathrm{p}_{1} \mathrm{q}_{0}+\sum \mathrm{p}_{1} \mathrm{q}_{1}}{\sum \mathrm{p}_{1} \mathrm{q}_{1}+\sum \mathrm{p}_{1} \mathrm{q}_{1}} \times 100$
(d) $\mathrm{P}_{01}=\frac{\sum \mathrm{p}_{1} \mathrm{q}_{1}+\sum \mathrm{p}_{1} \mathrm{q}_{1}}{\sum \mathrm{p}_{0} \mathrm{q}_{0}+\sum \mathrm{p}_{0} \mathrm{q}_{1}} \times 100$
101. Laspeyres' quantity index number is given by
(a) $\mathrm{Q}_{01}=\frac{\sum \mathrm{q}_{1} \mathrm{p}_{0}}{\sum \mathrm{q}_{0} \mathrm{p}_{0}} \times 100$
(b) $\mathrm{P}_{01}=\frac{\sum \mathrm{q}_{1} \mathrm{p}_{0}}{\sum \mathrm{q}_{0} \mathrm{p}_{0}} \times 100$
(c) $\mathrm{Q}_{01}=\frac{\sum \mathrm{q}_{1} \mathrm{p}_{0}}{\sum \mathrm{q}_{1} \mathrm{p}_{0}} \times 100$
(d) $\mathrm{Q}_{01}=\frac{\sum \mathrm{q}_{1} \mathrm{p}_{1}}{\sum \mathrm{q}_{0} \mathrm{p}_{1}} \times 100$
102. The time reversal test is not satisfied by
(a) Laspeyres' Method
(b) Paasche's Method
(c) Neither of the above
(d) Both of the above
103. The circular test is satisfied by
(a) Laspeyres' Index
(b) Paasche's Index
(c) Fisher's Ideal Index
(d) None of the above
104. The components or a time series are
(a) Secular trend
(b) Irregular variation
(c) Cyclical variation
(d) All of the above
105. The coefficient of correlation
(a) Has no limit
(b) Can be less than 1
(c) Can be more than 1
(d) Varies between $+1 \_$
106. From a pack of 52 cards, two cards are drawn together at random. What is the probability of both the cards being kings
(a) $\frac{1}{15}$
(b) $\frac{25}{57}$
(c) $\frac{1}{221}$
(d) None of the above
107. Index number are expressed in
(a) Ratios
(b) Squares
(c) Percentages
(d) Combinations
108. Index for base period is always taken as
(a) 100
(b) 0
(c) 200
(d) None of the above
109. Symbolically time reversal test is given as
(a) $\mathrm{P}_{\mathrm{o} 1} \times \mathrm{P}_{10}$
(b) $\mathrm{P}_{01} \times \mathrm{P}_{10}=1$
(c) $\mathrm{P}_{01} \times \mathrm{P}_{10} \neq 1$
(d) None of the above
110. Consumer price index indicates
(a) Rise
(b) Fall
(c) Both (a) and (b)
(d) None of the above
111. Fisher's ideal index number is the geometric mean of the
(a) Laspeyre's and Marshall Edgeworth indices
(b) Laspeyre's and Paasche's indices
(c) Both (a) and (b)
(d) None of the above
112. A time series consists of
(a) Short-term variation
(b) Long-term variation
(c) Irregular variation
(d) All the above
113. An index which is constructed from a group of variables is considered as:
(a) Composite index
(b) Univariate index
(c) Multiple index
(d) None of the above
114. Purchasing power of money can be accessed through:
(a) Simple index
(b) Fisher's index
(c) Consumer price index
(d) Volume index
115. If the price of commodity' $\mathrm{X}^{\prime}$ is 4 in the year 2003 and 5 in the year 2004. Then, the price index for the year 2004, used 2003 as base year is:
(a) 100
(b) 125
(c) 130
(d) 135
116. Laspeyres index $=110$, Paasche's index $=108$, then Bowley's index is equal to:
(a) 110
(b) 108
(c) 100
(d) 109
117. A time series consists of:
(a) Seasonal variations
(b) Cyclical variations
(c) Irregular variations
(d) All of the above
118. Changes that have taken place as a result of such forces that could not be predicted like floods, earthquakes, famines, etc is known as:
(a) Secular trend
(b) Seasonal movements
(c) Irregular variations
(d) Cyclical variations
119. In semi averages method, the given data is divided into:
(a) Two equal parts
(b) Three equal parts
(c) Four equal parts
(d) Difficult to tell
120. The additive model of the time series is:
(a) $\mathrm{Y}=\mathrm{T}+\mathrm{S}+\mathrm{C}+\mathrm{I}$
(b) $\mathrm{Y}=\mathrm{TSCI}$
(c) $Y=a+b X$
(d) $Y=a+b X+c X$

## Unit - 4

121. Two matrices $A$ and $B$ are multiplied to get $A B$ if
(a) Both are rectangular
(b) Both have same order
(c) No of columns of $A$ is equal to columns of $B$
(d) No of rows of A is equal to rows of B
122. Transpose of a column matrix is
(a) Zero matrix
(b) Diagonal matrix
(c) Column matrix
(d) Row matrix
123. The determinant of identity matrix is :
(a) 1
(b) 0
(c) Depends on the matrix
(d) None of the above
124. The matrix [6] is
(a) Square matrix
(b) Row matrix
(c) Column matrix
(d) All of the above
125. If matrix $A$ is of order $m \times n$ then the matrix of order $n \times m$ is called
(a) Transpose of A
(b) Inverse of A
(c) Main diagonal of A
(d) Echelon form of A
126. In the determinant $\left|\begin{array}{ccc}2 & 0 & 6 \\ -1 & 4 & 3 \\ 1 & 5 & 9\end{array}\right|$ find minor of element 3:
(a) 10
(b) 20
(c) 24
(d) 30
127. If $\left|\begin{array}{cc}2 x & -1 \\ 4 & 2\end{array}\right|=\left|\begin{array}{ll}3 & 0 \\ 2 & 1\end{array}\right|$ then x is
(a) 3
(b) $2 / 3$
(c) $3 / 2$
(d) $-1 / 4$
128. If $\mathrm{A}=\left|\begin{array}{lll}1 & 1 & -2 \\ 2 & 1 & -3 \\ 5 & 4 & -9\end{array}\right|$, find $|A|$
(a) 0
(b) 1
(c) 2
(d) -1
129. Which of the following is a diagonal matrix?
(a) $\left[\begin{array}{ll}1 & 2 \\ 2 & 1 \\ 1 & 2\end{array}\right]$
(c) $\left[\begin{array}{lll}0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0\end{array}\right]$
(b) $\left[\begin{array}{lll}1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1\end{array}\right]$
(d) $\left[\begin{array}{lll}0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0\end{array}\right]$
130. Which of the following is a square matrix?
(a) $\left[\begin{array}{ll}1 & 2 \\ 3 & 4\end{array}\right]^{2}$
(c) $\left[\begin{array}{lll}1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9\end{array}\right]^{2}$
(b) $\left[\begin{array}{lll}3 & 2 & 1 \\ 7 & 8 & 9 \\ 4 & 5 & 6\end{array}\right]$
(d) $\left[\begin{array}{ll}1 & 2 \\ 1 & 2 \\ 1 & 2\end{array}\right]$
131. Which of the following is the transpose of $\mathrm{A}=\left[\begin{array}{lll}1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1\end{array}\right]$
(a) $\mathrm{A}^{\prime}=\left[\begin{array}{lll}1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1\end{array}\right]$
(c) $A^{\prime}=\left[\begin{array}{lll}0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0\end{array}\right]$
(b) $\mathrm{A}^{\prime}=\left[\begin{array}{lll}0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0\end{array}\right]$
(d) $\mathrm{A}^{\prime}=\left[\begin{array}{lll}1 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 1\end{array}\right]$
132. Which of the following is correct?
(a) $\left[\begin{array}{ll}1 & 2 \\ 3 & 1\end{array}\right]+\left[\begin{array}{ll}1 & 3 \\ 2 & 1\end{array}\right]=\left[\begin{array}{ll}3 & 4 \\ 3 & 4\end{array}\right]$
(c) $\left[\begin{array}{ll}1 & 2 \\ 3 & 1\end{array}\right]+\left[\begin{array}{ll}1 & 3 \\ 2 & 1\end{array}\right]=\left[\begin{array}{ll}2 & 5 \\ 5 & 2\end{array}\right]$
(b) $\left[\begin{array}{ll}1 & 2 \\ 3 & 1\end{array}\right]+\left[\begin{array}{ll}1 & 3 \\ 2 & 1\end{array}\right]=\left[\begin{array}{ll}3 & 3 \\ 4 & 4\end{array}\right]$
(d) $\left[\begin{array}{ll}1 & 2 \\ 3 & 1\end{array}\right]+\left[\begin{array}{ll}1 & 3 \\ 2 & 1\end{array}\right]=\left[\begin{array}{ll}1 & 3 \\ 2 & 4\end{array}\right]$
133. Which of the following is the correct formula for Inverse of a Matrix?
(a) $\mathrm{A}^{-1}=\frac{|A|}{1} \cdot \operatorname{Adj} A$
(c) $\mathrm{A}^{-1}=\frac{|1|}{\operatorname{Adj} A} \cdot A$
(b) $\mathrm{A}^{-1}=\frac{|1|}{|A|} \cdot \operatorname{Adj} A$
(d) $\mathrm{A}^{-1}=\frac{\operatorname{Adj} A}{A}$
134. Which of the following is the determinant of $\mathrm{A}=\left[\begin{array}{lll}1 & 2 & 3 \\ 4 & 5 & 6\end{array}\right]$
(a) 0
(b) (c) 28
(c) 21
(d) (d) 6
135. Which of the following matrix Multiplication is valid?
(a) $\left[\begin{array}{ll}1 & 2 \\ 3 & 1\end{array}\right] \cdot\left[\begin{array}{lll}1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9\end{array}\right]$
(c) $\left[\begin{array}{ll}1 & 2 \\ 3 & 1\end{array}\right] \cdot\left[\begin{array}{ll}1 & 2 \\ 3 & 5 \\ 4 & 6\end{array}\right]$
(b) $\left[\begin{array}{ll}1 & 2 \\ 3 & 1\end{array}\right] \cdot\left[\begin{array}{lll}1 & 2 & 3 \\ 4 & 5 & 6\end{array}\right]$
(d) $\left[\begin{array}{ll}1 & 2 \\ 3 & 1\end{array}\right] \cdot\left[\begin{array}{lll}1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1\end{array}\right]$
136. Which of the following is true?
(a) $\mathrm{A} \cdot \mathrm{B}=\mathrm{A}^{\prime} \cdot \mathrm{B}$
(b) (c) A.B = A.B'
(c) $(\mathrm{AB})^{\prime}=\mathrm{B}^{\prime} . \mathrm{A}^{\prime}$
(d) $(\mathrm{d})(\mathrm{A}=\mathrm{B})^{\prime}=\mathrm{A}^{\prime} \cdot \mathrm{B}^{\prime}$
137. If $A=\left[\begin{array}{lll}2 & 1 & 9 \\ 4 & 6 & 3\end{array}\right]$, the order of matrix $A$ is:
(a) 3 X 2
(b) $2 \times 3$
(c) 1 X 3
(d) 3X1
138. Mention the type of the matrix $\mathrm{A}=\left[\begin{array}{rrr}1 & -2 & 4 \\ -2 & 3 & 5 \\ 4 & 5 & 8\end{array}\right]$
(a) Symmetric Matrix
(b) Skew symmetric Matrix
(c) Null Matrix
(d) Identity Matrix
139. If $A=\left[\begin{array}{ll}3 & -6 \\ 2 & -4\end{array}\right]$, then $|A|=$
(a) -12
(b) 12
(c) 0
(d) None of the above
140. If $B=\left[\begin{array}{cc}2 & -3 \\ 1 & 6\end{array}\right]$, then transpose of $B$ is
(a) $\left[\begin{array}{ll}2 & 1 \\ 3 & 6\end{array}\right]$ (b) $\left[\begin{array}{rr}2 & 1 \\ -3 & 6\end{array}\right]$ (c) $\left[\begin{array}{rr}2 & -3 \\ 1 & 6\end{array}\right]$ (d) $\left[\begin{array}{ll}2 & 3 \\ 1 & 6\end{array}\right]$
141. $\left[\begin{array}{ll}1 & 0 \\ 0 & 1\end{array}\right]$ is matrix of the type
(a) Zero matrix
(b) Unit matrix
(c) Row Matrix
(d) Column Matrix
142. Two matrices $A$ and $B$ are multiplied to get $A B$ if,
(a) both are rectangular
(b) both have the same order
(c) number of columns of A is equal to number of rows of B
(d) number of rows of A is equal to number of columns of B
143. A matrix having ' $m$ ' rows and ' $n$ ' columns with $m \neq n$ is said to be a
(a) Scalar Matrix
(b) Identity Matrix
(c) Square Matrix
(d) Null Matrix
144. [4 $\left.\begin{array}{lll}4 & 6 & 3\end{array}\right]$ is a
(a) Row Matrix
(b) Column Matrix
(c) Identity Matrix
(d) Square Matrix
145. Increase in the number of patients in the hospital due to stroke is
(a) Secular trend
(b) Irregular variation
(c) Seasonal variation
(d) Cyclical variation
146. Damages due to floods, droughts and strikes fires are associated with the components of which of the time series
(a) Secular trend
(b) Cyclical variation
(c) Seasonal variation
(d) Irregular variation
147. Transpose of rectangular matrix is a
(a) Rectangular matrix
(b) Diagonal matrix
(c) Square matrix
(d) Scaler matrix
148. Two matrices A and B are multiplied to get AB if
(a) Both are rectangular
(b) Both have same order
(c) Number of columns of A is equal to columns of B
(d) Number of rows of A is equal to columns of B
149. Transpose of row matrix is a
(a) Zero matrix
(b) Diagonal matrix
(c) Column matrix
(d) Row matrix
150. If $|A|=0$, then $A$ is
(a) Zero matrix
(b) Singular matrix
(c) Non-singular matrix
(d) None of the above
151. Cramer's rule fails for
(a) Determinants $>0$
(b) Determinants $<0$
(c) Determinants $=0$
(d) None of the above
152. Cramer's Rule is not suitable for which type of problems?
(a) Small systems with 4 unknowns
(b) Systems with 2 unknowns
(c) Large systems
(d) None of the above
153. The element residing in the $3^{\text {rd }}$ column and $4^{\text {th }}$ row is represented by:
(a) (a) $\mathrm{a}_{12}$
(b) (b) $a_{43}$
(c) (c) $a_{34}$
(d) NOTA
154. A matrix that has elements in the horizontal line only is known as:
(a) Square Matrix
(b) Determinant
(c) Row Matrix
(d) Column Matrix
155. $\left[\begin{array}{ccc}2 & 4 & 5 \\ -1 & -3 & 4\end{array}\right]+3\left[\begin{array}{ccc}-2 & 1 & -2 \\ 1 & 3 & -1\end{array}\right]$ is
(a) $\left[\begin{array}{ccc}4 & -7 & 1 \\ 1 & 5 & 2\end{array}\right]$
(b) $\left[\begin{array}{ccc}-5 & 8 & 0 \\ 0 & -2 & 5\end{array}\right]$
(c) $\left[\begin{array}{ccc}-4 & 7 & -1 \\ 2 & 6 & 1\end{array}\right]$
(d) NOTA
156. Matrix multiplication is possible if and only if
(a) The number of columns in the first row is similar with the number rows in the second matrix.
(b) Number of rows are equal in the two matrices
(c) Number of columns are equal
(d) NOTA
157. The value of a determinant $\left|\begin{array}{ccc}2 & 3 & -4 \\ 0 & -4 & 2 \\ 1 & -1 & 5\end{array}\right|$ is
(a) -36
(b) -46
(c) 46
(d) NOTA
158. For the equations $2 x-y=5 ; 3 x+2 y=-3$; The values of $x$ and $y$ are
(a) -1 and 3
(b) 1 and -3
(c) 2 and 3
(d) NOTA
159. For the equations $2 x+y-z=3 ; x+y+z=1 ; x-2 y-3 z=4$. We have
(a) $x=2, y=-1, z=0$
(b) $x=-2, y=1, z=1$
(e) $x=1, y=2, z=3$
(c) NOTA
160. Inverse of a Matrix $\mathrm{A}, \mathrm{A}^{-1}=$
(a) Adjoint of A
(b) $\frac{1}{|A|} \times$ Transpose of A
(c) $\frac{1}{|A|} \mathrm{xAdjoint}$ of A
(d) A X Minors X Cofactors

## Unit - 5

161. If $f(x)=(x-a)^{2}(x-b)^{2}$, then $f(a+b)$ is:
(a) ab
(b) $a+b$
(c) $\mathrm{a}-\mathrm{b}$
(d) $a^{2} b^{2}$
162. Function $\mathrm{f}(\mathrm{x})$ is exist when:
(a) $\mathrm{LHL}=\mathrm{RHL}$
(b) LHL $\neq$ RHL
(c) $\mathrm{LHL}>$ RHL
(d) $\mathrm{LHL}<$ RHL
163. If $x^{2}+y^{2}=5$, then $\frac{d y}{d x}$ is:
(a) $\frac{x}{y}$
(b) $-\frac{x}{y}$
(c) $x+y$
(d) $x-y$
164. $\frac{d}{d x}$ of $a^{5 x}$ is
(a) $a^{5 x} \log _{e} a$
(b) $5 x a^{5 x} \log _{e} a$
(c) $\mathrm{x} a^{5 x} \log _{e} a$
(d) $5 a^{5 x} \log _{e} a$
165. If $y=\log x, \frac{d^{2} y}{d x^{2}}$ is:
(a) $\frac{1}{x}$
(b) $-\frac{1}{x}$
(c) $\frac{1}{x^{2}}$
(d) $-\frac{1}{x^{2}}$
166. $\int d x$ is:
(a) $1+c$
(b) 0
(c) $x+c$
(d) $y+c$
167. $\int_{0}^{2}\left(x^{3}+2\right)$ is:
(a) 6
(b) 7
(c) 8
(d) 9
168. If revenue function $R=3 x$ and cost function $C=100+0.015 x^{2}$, where x is the units produced, what is the profit maximizing output?
(a) 50
(b) 100
(c) 150
(d) 200
169. Which of the following is the derivative of $y=(3 x+1)^{7}$
(a) $21(3 x+1)^{6}$
(c) $3(21 x+7)^{6}$
(b) $21(2 x)^{6}$
(d) $7(3 x+1)^{6}$
170. Which of the following is correct integration of $\int 3 x^{2}\left(x^{3}+5\right)^{7} d x$ ?
(a) $\frac{\left(x^{3}\right)^{8}}{8}+c$
(c) $\frac{\left(x^{3}\right)^{8}}{7}+c$
(b) $\frac{\left(x^{3}\right)^{6}}{3}+c$
(d) $\frac{\left(x^{3}\right)^{7}}{7}+c$
171. Which of the following is the correct derivative of $\mathrm{f}(\mathrm{x})=x^{4}+2 x^{3}-x^{2}+4 x-1$ ?
(a) $f^{\prime}(x)=4 x^{4}+6 x^{3}-2 x^{2}+4 x$
(c) $f^{\prime}(x)=4 x^{4}-6 x^{3}+2 x^{2}-4 x$
(b) $f^{\prime}(x)=4 x^{3}+6 x^{2}-2 x+4$
(d) $f^{\prime}(x)=4 x^{3}-6 x^{2}+2 x-4$
172. Which of the following is correct answer $\operatorname{fprlim}_{x \rightarrow 1} f(x)=\frac{x^{2}-1}{x-1}$ ?
(a) 3
(c) 2
(b) 0
(d) 1
173. Which of the following is correct differentiation with repect to x when $y=5^{x+2}$ ?
(a) $\ln x \cdot 5^{x+2}$
(c) $\left(\ln x \cdot 5^{x+2}\right) / 5$
(b) $\ln x \cdot 5^{2 x}$
(d) $\ln x^{2} \cdot 5^{2}$
174. Which of the following is correct about derivation of total cost function and average cost function from the marginal cost function?
(a) $\int M C(x) d x=A C(x)+c$
(c) $\int M C(x)=T C(x)+c$
(b) $\int M C(x) d x=T C(x)+c$
(d) $\int M C(x)=A C(x)+c$
175. Which of the following is correct about derivation of total revenue function and average revenue function from the marginal revenue function?
(a) $T C(x)=\int M R(x) d x=T C^{\prime}(x)+C$
(c) $T R(x)=\int M C(x) d x=T C^{\prime}(x)+$ $C$
(b) $T C(x)=\int M R(x) d x=T R(x)+C$ C
176. Which of the following is the integration of $\sin \mathrm{x}$ ?
(a) $-\sin x$
(c) $-\cos x$
(b) $\cos x$
(d) $\frac{1}{\cos x}$
177. A function expressed directly in terms of the dependent variable is an $\qquad$ function, where one variable is dependent on the other.
(a) implicit
(b) fixed
(c) variable
(d) explicit
178. In the equation $y=f(x), y$ is the $\qquad$ variable and $x$ is the
$\qquad$ variable.
(a) dependent; independent
(b) independent; dependent
(c) first; second
(d) explicit; implicit
179. The limit of a constant function $\lim _{x \rightarrow a} f(x)=c$ is
(a) x
(b) c
(c) a
(d) $\mathrm{f}(\mathrm{x})$
180. The derivative of $\mathrm{x}^{3}$ is
(a) $3 x$
(b) 3
(c) $3 x^{2}$
(d) x
181. The derivative of $(5 x-2)^{3}$ is
(a) $15(5 x-2)^{2}$
(b) $5 \mathrm{x}-2$
(c) $15(5 x-2)^{3}$
(d) $15 \mathrm{x}-2$
182. The derivative of $2 x+3$ is
(a) x
(b) 3
(c) 2
(d) 1
183. 7. $\int d x$ is equal to
(a) 1
(b) x
(c) y
(d) 0
1. The integration of $\int \frac{1}{\sqrt{x}} \mathrm{dx}$ is
(a) $2 \sqrt{x}$
(b) 1
(c) 2
(d) 0
2. A square matrix in which every non-diagonal is zero and all diagonal elements are equal is called
(a) Scaler matrix
(b) Square matrix
(c) Column matrix
(d) Row matrix
3. If rows are changed into column and column are change into rows, the $n$ the value of determinants
(a) Remains unchanged
(b) Changed
(c) Becomes zero
(d) None of the above
4. Differential calculus helps to find the
(a) Rate of change of a quantity
(b) Quantity when the rate of change is known
(c) Quantity when the rate of change is unknown
(d) None of the above
5. Integral calculus helps to find the
(a) Rate of change of a quantity
(b) Quantity when the rate of change is known
(c) Quantity when the rate o change is unknown
(d) None of the above
6. $\int_{\sqrt{x}}^{1} d x=$
(a) $\frac{1}{x}+C$
(b) $2 \sqrt{x}+C$
(c) $\sqrt[2]{x}+C$
(d) None of the above
7. A function expressed directly in terms of the dependent variable is said to be an
(a) Explicit function
(b) One valued function
(c) Two valued function
(d) None of the above
8. When the dependent variable increases with an increase in the independent variable, the function is called
(a) Algebraic functions
(b) Rational functions
(c) Monotonically increasing function
(d) None of the above
9. The limit of the ratio of the increment in the function corresponding to a small increment in the argument as the latter tends to zero is
(a) matrix
(b) limit
(c) function
(d) derivative
10. The value of $\lim _{x-3}\left(\left(x^{2}-9\right) /(x-3)\right)$ is
(a) 3
(b) -6
(c) 6
(d) NOTA
11. Derivative of $x^{3}-3 x^{2}+7 x-4$ with respect to $x$ is
(a) $3 x^{2}-6 x+7$
(b) $x^{2}-5 x+7$
(e) $3 x^{2}+6 x+7$
(c) 0
12. $\frac{d}{d x}\left(\sin ^{2} \mathrm{x}+\cos ^{2} \mathrm{x}\right)$ is
(a) $2 \sin x+2 \cos x$
(b) $2 \cos x-2 \sin x$
(c) $\cos x-\sin x$
(d) 0
13. Maxima of a function is determined by
(a) $\frac{d y}{d x}=0$ and $\left(\mathrm{d}^{2} y / \mathrm{dx}^{2}\right)>0$
(b) $\frac{d y}{d x}=0$ and $\left(\mathrm{d}^{2} y / \mathrm{dx}^{2}\right)<0$
(c) $\frac{d y}{d x}>0$ and $\left(\mathrm{d}^{2} y / \mathrm{dx}^{2}\right)=0$
(d) NOTA
14. Integration is also known as
(a) Anti-derivative
(b) Disintegration
(c) Differentiation
(d) Integral
15. . $\int e^{x} \mathrm{dx}$ is
(a) $e^{x}+\mathrm{c}$
(b) $x \mathrm{e}^{\mathrm{x}}+\mathrm{c}$
(c) $\mathrm{xe}^{\mathrm{x}+1}$
(d) NOTA
16. $\int \log x d x i s$
(a) $\frac{1}{\log x}$
(b) $\log x+c$
(c) $x \log x-x+c$
(d) NOTA
17. $\int\left(\tan ^{2} x\right) d x$ is
(a) $\tan x+x$
(b) $\tan x-x+c$
(c) $\left(\tan ^{3} \mathrm{x}\right) / 3+\mathrm{c}$
(d) NOTA

## II. Fill in the blanks

## Unit - 1

1. $\qquad$ is the reciprocal of the AM of the reciprocal of observations
2. $\qquad$ always lies in between arithmetic mean and mode
3. For the purpose of comparison between two or more series with varying zero or no. of items, varying central values or units of calculation, ony $\qquad$ measures can be used
4. The number of observations corresponding to a particular class is known as the
$\qquad$ of that class
5. Statistics relates to the collection, classification, presentation, analysis and
$\qquad$ of numerical data.
6. Statistics deals only with $\qquad$ data.
7. Highest time occurring observation called $\qquad$ .
8. Standard deviation is having effect in change of $\qquad$ but not change in origin.
9. $\qquad$ divides the data into four equal parts.
10. $\qquad$ is a positional average.
11. $\qquad$ is also known as root mean square deviation.
12. The average of squared deviations from mean is called $\qquad$ .
13. Statistics is applicable only to $\qquad$ data.
14. In the recruitment of right type of personnel for a job, the aptitude and efficiency of candidates are statistically determined by using $\qquad$ .
15. $\qquad$ statistics takes data from a sample and makes inferences about the larger population from which the sample was drawn.
16. $\qquad$ is the simplest means of dispersion.
17. In $\qquad$ sense, the word 'statistics' refers to numerical data.
18. $\qquad$ are the data that are collected for the first time by an investigator for a specific purpose.
19. $\qquad$ refers to the middle value in the distribution.
20. The degree to which numerical data tend to spread about an average value is called

## Unit - 2

21. According to $\qquad$ theorem, if two events A and B are mutually exclusive, the probability of occuraence of either A or B is giveb by $\mathrm{P}(\mathrm{A})+\mathrm{P}(\mathrm{B})$
22. Two or more events are said to be $\qquad$ when the outcomes of one does not affect the other.
23. If the sum of the product of deviations of $x$ and $y$ series from their means i.e. $\Sigma x y$ is zero, the coefficient of correlation shall be $\qquad$
24. If the amount of change in one variable tends to bear a constant ratio to the amount of change in the other variable, then the correlation is said to be $\qquad$
25. The correlation coefficient is the $\qquad$ of two regression coefficients
26. The graph showing the paired points of $(\mathrm{Xi}, \mathrm{Yi})$ is called $\qquad$
27. In the regression equation $Y=a+b X, a$ is called
28. Probability of a sure event is. $\qquad$
29. Two or more events are said to be $\qquad$ if the outcome of one does not affect and is not affected by the other.
30. According to $\qquad$ theorem, if two events A and B are independent, the probability that both will occur is equal to the product of their individual probabilities.
31. If the value of $Y$ decreases as the value of $X$ decreases, there is $\qquad$ correlation between the two variables.
32. If the variables are $\qquad$ , the regression lines are at right angles.
33. $\qquad$ theorem states that if two events A and B are mutually exclusive the probability of the occurrence of either A or B is the sum of the individual probability of A and B.
34. The process by which we estimate the value of dependent variable on the basis of one or more independent variables is called $\qquad$ .
35. $\qquad$ eventsare those in which the occurrence or non-occurrence of one event in any one trial affects the probability of other events in other trials.
36. Correlation is said to be $\qquad$ if both variables are varying in the same direction.
37. If we tossed a single coin, the probability of getting head is $\qquad$
38. In multiplication theorem of probability, $\mathrm{P}(\mathrm{A}$ and B$)=$ $\qquad$
39. $\qquad$ is an analysis of the covariation between two or more variables.
40. The variable which is used to predict the variable of interest is called $\qquad$

## Unit - 3

41. The factor reversdal test is only satisfied by $\qquad$
42. The method of combining two or more overlaping series of index numbers into one continuous series is called $\qquad$
43. A type of periodic movement where the period is not longer than one year is
44. In least square method for measurement of trend, the straight line trend is represented by the equation $\qquad$
45. Price relatives are a percentage ratio of current year price and $\qquad$ .
46. Purchasing power of money can be accessed through $\qquad$ .
47. The most commonly used mathematical method for measuring the trend is
$\qquad$ .
48. A time series has $\qquad$ components.
49. Index numbers measure $\qquad$ in a group of variables over a period of time.
50. Changing the reference base period is known as $\qquad$ the base.
51. A time series is a set of statistical observations arranged in $\qquad$ order.
52. Changes that occur as a result of booms and depressions are $\qquad$ variations.
53. Index number can be used for $\qquad$ .
54. An orderly set of data arranged in accordance with their time of occurrence is called
$\qquad$ .
55. Fishers ideal index is calculated by using the equations $\qquad$ .
56. $\qquad$ is the method of combining two or more overlapping series of index numbers into one continuous series.
57. $\qquad$ index compares the levels of prices from one period to another.
58. In time reversal test, $\mathrm{P}_{01} \times \mathrm{P}_{10}=$ $\qquad$
59. $\qquad$ is a set of statistical observations arranged in chronological order.
60. Changes that have taken place during a period of 12 months as a result of change in climate, weather conditions, festivals, etc are called $\qquad$ variation.

## Unit - 4

61. If any Matrix A has different numbers of rows and columns, then matrix A is $\qquad$
62. If $\left|\begin{array}{ccc}5 & 6 & -3 \\ -4 & 3 & 2 \\ -4 & -7 & 3\end{array}\right|$, then cofactor of the element $\mathrm{a}_{21}$ is $\qquad$
63. The matrix $\left[\begin{array}{ll}k & 2 \\ 3 & 4\end{array}\right]$ has no inverse, then the value of k is equal to $\qquad$
64. The sum of the products of elements of any row with the co-factors of corresponding elements is equal to. $\qquad$
65. The determinant of identity matrix is $\qquad$
66. If determinant of a matrix A is Zero than matrix A is a $\qquad$
67. If the order of matrix $A$ is $m \times p$. And the order of $B$ is $p \times n$. Then the order of matrix AB is $\qquad$
68. Idea of matrices was introduced by Arthur Caylet in $\qquad$ century.
69. Division of a unit matrix by any square matrix can be accomplished by a process known as $\qquad$ _.
70. A $\qquad$ is the determinant of a square matrix formed by deleting one row and one column from some larger square matrix.
71. If we interchange rows and columns of a matrix, the new matrix obtained is known as $\qquad$ .
72. A matrix in which there is only one row and any number of columns is said to be
$\qquad$ matrix.
73. A square matrix in which all elements except at least one element in diagonal are zeros is said to be $\qquad$ matrix.
74. Matrices obtained by changing rows and columns is called $\qquad$ .
75. A matrix in which numbers of rows is equal to the number of column is called
$\qquad$ matrix.
76. A square matrix in which every non-diagonal is zero and every diagonal element is 1 is called a $\qquad$ matrix.
77. A matrix having the same number of rows and columns is called $\qquad$ .
78. A matrix $\left[\mathrm{a}_{\mathrm{ij}}\right]_{2 \times 5}$ has $\qquad$ number of elements.
79. Interchanging rows and columns of a Matrix is known as $\qquad$ .
80. If two rows or columns of a determinant are identical or proportional to one another, the value of that determinant is $\qquad$ .

## Unit - 5

81. Limit is called $\qquad$ hand limit, whenlim $x_{x \rightarrow a^{-}} f(x)$.
82. When the value of a function is equal at LHL, RHL and at the point called
$\qquad$ at that particular point of $x$.
83. $\overline{d^{2} y} \frac{d x^{2}}{}$ is called the $\qquad$ order derivative of a function.
84. $\int \frac{1}{x} d x$ is $\qquad$ .
85. The derivative of $\cos x$ is $\qquad$
86. If $f(x)=g(u)$ and $u=u(x)$ then $\qquad$
87. The derivative of $[\mathrm{g}(\mathrm{x})] 2$ is equal to [ $\left.\mathrm{g}^{\prime}(\mathrm{x})\right] 2$ $\qquad$ (True / False)
88. $\int \sec ^{2} x d x=$ $\qquad$
89. If a symbol $x$ denotes any element of a given set of numbers, then $x$ is said to be a
90. The $\qquad$ of a function is that fixed value to which a function approaches as the variable approaches a given value.
91. A function $f(x)$ is said to be at its minimum value at $x=a$ if the function ceases to
$\qquad$ and begins to increase at $x=a$.
92. A function $f(x)$ is said to be at its $\qquad$ value at $x=a$ if the function ceases to increase and begins to decrease at $\mathrm{x}=\mathrm{a}$.
93. A matrix having only one row is called $\qquad$ .
94. A matrix having only one column is said to be $\qquad$ .
95. When a function has only one value corresponding to each value of the independent variable, the function is called a $\qquad$ .
96. When a function has two values corresponding to each value of the independent variable, the function is said to be $\qquad$ -.
97. The rate of change of velocity or a change in the rate of change is known as
98. If the function first decreases and then stop decreasing. After which the function starts increasing. The point at which the function stops decreasing is called
99. The value of $\int x^{n} d x$ is $\qquad$
100. Integration is a branch of Mathematics formulated by a scientist named

## KEY ANSWER

## I. Choose the correct answet

## Unit - 1

1. (c) both art as well as science
2. (d) ading upper and lower limit and dividing by 2
3. (c) both (a) and (b)
4. (b) 0
5. (a) 0
6. (b) mean deviation
7. (a) absolute measure
8. (d) dispersion
9. (b)
10. (c)
11. (b)
12. (c)
13. (c)
14. (c)
15. (b)
16. (d)
17. (a) quantitative characteristics
18. (a) lower limit of the first class and the upper limit of the last class are known
19. (c) mode $=3$ median -2 mean
20. (c) arithmetic mean
21. (b) an absolute measures
22. (c) the third quartile and the first quartile
23. (b) negative
24. (c) mean deviation
25. (b) Median
26. (c) 18
27. (b) Median
28. (c) Both art as well as science
29. (a) Arithmetic mean
30. (d) 0
31. (a) Mean
32. (c) Independent
33. (c)
34. (d)
35. (a)
36. (d)
37. (c)
38. (d)
39. (b)
40. (a)

## Unit - 2

41. (c) mutually exclusive events
42. (b) $\mathrm{P}(\mathrm{A}) \times \mathrm{P}(\mathrm{B})$
43. (a) dependent event
44. (d) $\frac{3}{4}$
45. (a) $2 / 13$
46. (c) positive correlation
47. (d) varies between -1 and +1
48. (b) $r^{2}$
49. (a)
50. (c)
51. (d)
52. (d)
53. (d)
54. (a)
55. (c)
56. (b)
57. (b) $\frac{1}{7}$
58. (d) $\frac{9}{20}$
59. (d) $\frac{1}{2}$
60. (b) Mutually exclusive events
61. (d) Spearman's Correlation Coefficient
62. (b) cause-effect relationship
63. (c) -1 to 1
64. (a) average of X and Y
65. (a) Positive correlation
66. (a) Mutually exclusive events
67. (b) Independent event
68. (d) Dependent event
69. (a) $\frac{1}{3}$
70. (b) $r$
71. (a) Origin
72. (d) Regression coefficient of Y on X
73. (c)
74. (b)
75. (a)
76. (b)
77. (d)
78. (c)
79. (a)
80. (b)

## Unit - 3

81. (a) simple aggregative method
82. (c) The geometric mean of Laspeyres and Paasches' index
83. (b) $\mathrm{P}_{\mathrm{o} 1} \times \mathrm{P}_{10}=1$
84. (c) base shifting
85. (a) trend
86. (c) demand forecast
87. (b) seasonal variation
88. (a) rising trend
89. (c)
90. (a)
91. (b)
92. (d)
93. (d)
94. (c)
95. (d)
96. (b)
97. (d) All of the above
98. (a) Simple Aggregative Method
99. (a) $\mathrm{P}_{01}=\frac{\Sigma \mathrm{p}_{1} \mathrm{q}_{1}}{\Sigma \mathrm{p}_{0} \mathrm{q}_{1}} \times 100$
100. (b) $\mathrm{P}_{01}=\frac{\sum \mathrm{p}_{1} \mathrm{q}_{0}+\sum \mathrm{p}_{1} \mathrm{q}_{1}}{\sum \mathrm{p}_{0} \mathrm{q}_{0}+\sum \mathrm{p}_{0} \mathrm{q}_{1}} \times 100$
101. (a) $\mathrm{Q}_{01}=\frac{\sum \mathrm{q}_{1} \mathrm{p}_{0}}{\sum \mathrm{q}_{0} \mathrm{p}_{0}} \times 100$
102. (d) Both of the above
103. (d) None of the above
104. (d) All of the above
105. (d) Varies between +1 and -1
106. (c) $\frac{1}{221}$
107. (c) Percentages
108. (a) 100
109. (b) $\mathrm{P}_{\mathrm{o} 1} \times \mathrm{P}_{10}=1$
110. (c) Both (a) and (b)
111. (b) Laspeyre's and Paasche's indices
112. (d) All the above
113. (a)
114. (c)
115. (b)
116. (d)
117. (d)
118. (c)
119. (a)
120. (a)

## Unit - 4

121. (c)
122. (d)
123. (a)
124. (d)
125. (a)
126. (b)
127. (d)
128. (a)
129. (b) $\left[\begin{array}{lll}1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1\end{array}\right]$
130. (b) $\left[\begin{array}{lll}3 & 2 & 1 \\ 7 & 8 & 9 \\ 4 & 5 & 6\end{array}\right]$
131. (a) $\mathrm{A}^{\prime}=\left[\begin{array}{lll}1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1\end{array}\right]$
132. (c) $\left[\begin{array}{ll}1 & 2 \\ 3 & 1\end{array}\right]+\left[\begin{array}{ll}1 & 3 \\ 2 & 1\end{array}\right]=\left[\begin{array}{ll}2 & 5 \\ 5 & 2\end{array}\right]$
133. (b) $\mathrm{A}^{-1}=\frac{|1|}{|A|} \cdot \operatorname{Adj} A$
134. (a) 0
135. (c) $\left[\begin{array}{ll}1 & 2 \\ 3 & 1\end{array}\right] \cdot\left[\begin{array}{ll}1 & 2 \\ 3 & 5 \\ 4 & 6\end{array}\right]$
136. (b) (AB) $=\mathrm{B}^{\prime} \cdot \mathrm{A}^{\prime}$
137. (b) $2 \times 3$
138. (a) Symmetric Matrix
139. (c) 0
140. (b) $\left[\begin{array}{rr}2 & 1 \\ -3 & 6\end{array}\right]$
141. (b) Unit matrix
142. (c) number of columns of A is equal to number of rows of B
143. (a) Scalar Matrix
144. (a) Row Matrix
145. (c) Seasonal variation
146. (d) Irregular variation
147. (a) Rectangular matrix
148. (c) Number of columns of $A$ is equal to columns of $B$
149. (c) Column matrix
150. (b) Singular matrix
151. (c)Determinants $=0$
152. (c) Large systems
153. (b)
154. (c)
155. (c)
156. (a)
157. (b)
158. (b)
159. (a)
160. (c)

## Unit - 5

161. (d)
162. (a)
163. (b)
164. (d)
165. (d)
166. (c)
167. (c)
168. (b)
169. (a) $21(3 x+1)^{6}$
170. (a) $\frac{\left(x^{3}\right)^{8}}{8}+c$
171. (b) $f^{\prime}(x)=4 x^{3}+6 x^{2}-2 x+4$
172. (c) 2
173. (a) $\ln x \cdot 5^{x+2}$
174. (b) $\int M C(x) d x=T C(x)+c$
175. (d) $T R(x)=\int M R(x) d x=T R^{\prime}(x)+C$
176. (c) $-\cos x$
177. (d) explicit
178. (a) dependent; independent
179. (b) c
180. (c) $3 x^{2}$
181. (a) $15(5 x-2)^{2}$
182. (c) 2
183. (b) x
184. (a) $2 \sqrt{x}$
185. (a) Scaler matrix
186. (a) Remains unchanged
187. (a) Rate of change of a quantity
188. (b) Quantity when the rate of change is known
189. (b) $2 \sqrt{x}+C$
190. (b) Explicit function
191. (c) Monotonically increasing function
192. (d) derivative
193. (c)
194. (a)
195. (d)
196. (b)
197. (a)
198. (a)
199. (c)
200. (b)

## II. Fill in the blanks

## Unit - 1

1. HM
2. median
3. relative
4. frequency
5. interpretation
6. quantitative
7. mode
8. scale
9. quartiles
10. median
11. standard deviation
12. variance
13. Quantitative
14. Test score
15. Inferential
16. Range
17. Plural
18. Primary data
19. Median
20. Dispersion/variation

## Unit - 2

21. addition
22. independent
23. zero
24. linear
25. Geometric mean
26. Scatter diagram
27. Y-intercept
28. 1
29. independent
30. Multiplication
31. positive
32. independent
33. Additional theorem
34. Regression
35. Dependent
36. Positive
37. $1 / 2$
38. $\quad \mathrm{P}(\mathrm{A}) \mathrm{X} P(\mathrm{~B})$
39. Correlation
40. Independent variable or explanatory variable

## Unit - 3

41. Fishers' index number
42. splicing
43. seasonal variation
44. $\quad Y_{c}=a+b X$
45. base year price
46. Consumer Price Index
47. Least Square Method
48. four
49. changes
50. shifting
51. chronological
52. cyclical
53. Forecasting
54. Time series
55. $\sqrt{ } \mathrm{L}+\mathrm{P} \times 100$
56. Fishers' index number
57. Price
58. 1 (one)
59. Time series
60. Seasonal

## Unit - 4

61. Rectangular Matrix
62. 3
63. $3 / 2$
64. Value of determinant
65. 1
66. Singular matrix
67. $\mathrm{m} \times \mathrm{n}$
68. 19th century
69. Inversion of matrix
70. minor
71. transpose
72. row
73. Diagonal
74. Transpose
75. Square
76. Unique or identity
77. Square matrix
78. 10
79. Transpose
80. Zero(0)

## Unit - 5

81. left
82. continuous
83. second
84. $\log x$
85. $-\sin x$
86. $f^{\prime}(x)=g^{\prime}(u) \cdot u^{\prime}(x)$
87. False. The derivative of $[\mathrm{g}(\mathrm{x})] 2$ is equal to $\left.2 \mathrm{~g}^{\prime}(\mathrm{x}) \cdot \mathrm{g}(\mathrm{x})\right]$.
88. $\tan ^{2} x+1$
89. variable
90. limit
91. decrease
92. maximum
93. Row matrix
94. Column matrix
95. One valued function
96. Two valued function
97. Acceleration
98. Minima
99. $\left(\mathrm{x}^{\mathrm{n}+1}\right) /(\mathrm{n}+1)$
100. Isaac Newton
