Seat No. : _____

ME-117

March-2019

B.Sc., Sem.-I

CC-3-101 : Statistics
(Descriptive Statistics - I)
(New Course)

Time : 2.30 Hours] **[Max. Marks : 70**

1. (A) Write the following :

(i) Distinguish between primary and secondary data. What precautions should be taken in the use of secondary data ? **7**

(ii) What are grouped and ungrouped frequency distributions ? What are their uses ? What are the considerations that one has to bear in mind while forming the frequency distribution ? **7**

OR

(i) How would you design Questionnaire ? Which points you should keep in mind when designing Questionnaire ? **7**

(ii) Prepare a specimen Questionnaire related to Malls which aimed to give better ways of providing shopping facilities to the consumers. **7**

(B) Answer the following questions : (Any **four**) **4**

(i) Give an illustration of primary data and secondary data.

(ii) State basic rules for a good classification.

(iii) What method would you employ in collection of data considering accuracy, time and cost involved when the field of inquiry is small ?

(iv) Which is a suitable method of collecting data in cases where the informants are literate and spread over a vast area ?

(v) Data are classified into _____ and _____.

(vi) There are _____ methods of collecting data.

2. (A) Write the following :

(i) Explain the method of constructing Histogram and Frequency Polygon. Which, out of these two, is better representative of frequencies of : (a) a particular group, and (b) whole group. **7**

(ii) Write short notes on : (a) Frequency distribution, (b) Frequency curve and (c) Ogive **7**

OR

(i) Explain diagrammatic representation of data using Bar diagrams namely : (a) Multiple bar, (b) Sub-divided bar and (c) Percentage bar diagrams. **7**

(ii) Write short notes on : (a) Rectangles Diagram and (b) Pie Diagram. **7**

(B) Answer the following questions : (Any **four**) **4**

(i) What is simple bar diagram ?

(ii) What is the limitation of simple bar diagram ?

(iii) If there is large number of items or values of variable under study, then instead of bar diagram which diagram is preferred ?

(iv) When the use of sub-divided bar diagram is not suggested ?

(v) When the number of components exceeds 10, which diagram is appropriate ?

(vi) Which chart is based on the area principal ?

3. (A) Write the following :

(i) Define mean, median and mode. Which of these measures is best ? Why ? **7**

(ii) Write important properties and applications of Arithmetic mean. Calculate the mean for the following frequency distribution. **7**

Class-interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	10	25	30	20	10

OR

(i) Define Partition values. Draw the cumulative frequency curve for the following distribution showing the number of marks of 59 students in statistics.

Marks-group	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Students	4	8	11	15	12	6	3

Locate the median in frequency curve you have drawn. **7**

(ii) Define Geometric mean and Harmonic mean of grouped and ungrouped data. Compare them and write their merits and demerits. **7**

(B) Answer the following questions : (Any **three**) **3**

(i) If an observation is zero in a series of n observations, then find the geometric mean of that series.

(ii) What is the empirical relation between mean, median and mode ?

(iii) Which measure of location will be suitable to compare intelligence of students ?

(iv) The mean of 20 observations is 15. On checking it was found that two observations were wrongly copied as 3 and 6. If wrong observations are replaced by correct values 8 and 4, then find the correct mean.

(v) What is the algebraic sum of the deviations of a set of n values from their arithmetic mean ?

4. (A) Write the following :

(i) The first three moments of a distribution about the value 5 are 4, 15 and –2. Find the mean, standard deviation and μ_3. Also find the values of first three raw moments. **7**

(ii) Explain the main difference between mean deviation and standard deviation. Show that standard deviation is independent of change of origin and scale. **7**

OR

(i) Explain the methods of measuring skewness and kurtosis of a frequency distribution. **7**

(ii) Obtain expression for first four central moments in terms of raw moments. **7**

(B) Answer the following questions : (Any **three**) **3**

(i) What is steam and leaf plot ?

(ii) What is box plots ?

(iii) Define skewness.

(iv) Define kurtosis.

(v) Mean of hundred observations is 50 and S.D. is 10. What will be the new mean and S.D. if 5 is subtracted from each observation and then it is divided by 4 ?

Seat No. : _____

ME-117

March-2019

B.Sc., Sem.-I

CC-3-101 : Statistics
(Statistical Method - I)
(Old Course)

Time : 2.30 Hours] **[Max. Marks : 70**

1. (A) Write the following :

(i) Define the following terms with illustration : **7**

(a) Discrete and continuous data

(b) Time series and cross-sectional data

(c) Primary and secondary data

(ii) What are grouped and ungrouped frequency distributions ? What are their uses ? What are the considerations that one has to bear in mind while forming the frequency distribution ? **7**

OR

(i) Explain various measures of central tendency with their merits and demerits. **7**

(ii) Explain the method of constructing Histogram and Frequency Polygon. Which, out of these two, is better representative of frequencies of : (1) a particular group and (2) whole group ? **7**

(B) Answer the following questions : (Any **four**) **4**

(i) Give one example each for nominal data and ordinal data.

(ii) Write any two applications of median.

(iii) What is steam and leaf plot ?

(iv) What is box plots ?

(v) What method would you employ in collection of data considering accuracy, time and cost involved when the field of inquiry is small ?

(vi) Which is a suitable method of collecting data in cases where the informants are literate and spread over a vast area ?

2. (A) Write the following :

(i) Give the classical and statistical definitions of probability. Write the objections which are raised in these definitions. **7**

(ii) State and prove 'Addition rule of Probability' for two events A and B. **7**

OR

(i) Explain the following terms using proper illustration : **7**

(a) Mutually exclusive and exhaustive events

(b) Random process and random experiment

(c) Sample space and venn diagram

(ii) Two dice, one green and the other red, are thrown. Let A be the event that the sum of the points on the faces shown is odd, and B the event of at least one ace(number '1').

Describe : (i) the complete sample space, (ii) events A, B, $A \cap B$. Obtain $P(A \cup B)$. **7**

(B) Answer the following questions : (Any **four**) **4**

(i) Seven cards are drawn at random from pack of 52 cards. What is the probability that 4 will be red and 3 black ?

(ii) What is the probability of obtaining a total of 9 in a single throw with two dice ?

(iii) A bag contains 7 white, 6 red and 5 black balls. Two balls are drawn at random. What is the probability that both the balls are white ?

(iv) Give an example of an impossible event.

(v) Find the probability of the impossible event.

(vi) Define sample space.

3. (A) Write the following :

(i) Define the law of demand and supply. Check whether the following functions are demand functions or supply functions : **7**

(a) $p = 4 - 5x^2$

(b) $p = 20 - (4/5)x$

(ii) Write a short note on Elasticity of demand. **7**

OR

(i) If the demand curve is $p = a \cdot e^{-kx}$ where p is the price and x is the demand then prove that the elasticity of demand is $1/kx$. Hence deduce the elasticity demand for the curve $p = 10 \cdot e^{-x/2}$. **7**

(ii) Define Total revenue, Marginal revenue and Average revenue. Also obtain the expression for elasticity of demand in terms of marginal revenue and average revenue. **7**

(B) Answer the following questions : (Any **three**) **3**

(i) What is market equilibrium ?

(ii) Define equilibrium price.

(iii) The demand and supply curves of commodity are $D = 19 - 3p - p^2$ and $S = 5p - 1$ respectively. Find the equilibrium price and the quantity demanded.

(iv) When two commodities A_1 and A_2 are said to complementary ?

(v) Define partial and cross elasticity of demand.

4. (A) Write the following :

(i) Explain the concept of Bivariate data and plotting of Bivariate data. **7**

(ii) Write a short note on principle of least square. **7**

OR

(i) What is linear regression ? Derive the equation of regression line of y on x. Why there are two regression lines ? **7**

(ii) Define the following terms : **7**

(a) Co-efficient of correlation

(b) Co-efficient of determination

(c) Rank correlation

(d) Parabolic exponential curve

(B) Answer the following questions : (Any **three**) **3**

(i) Define Product moments

(ii) Give the relation between correlation co-efficient and regression co-efficient.

(iii) State any two properties of correlation co-efficient.

(iv) Define scatter diagram.

(v) Write any two properties of correlation co-efficient.