Class / Semester / Subject Code: F.Y.B.Sc. (C.S.) / I / USCS106 Descriptive Statistics and Introduction to Probability

Date : 23.11.2019   Time : (2 ½ Hours)   Total Marks: 75

N.B. (1) All questions are compulsory.
      (2) Figures to the right indicate marks for respective sub questions.

Q.1)   Attempt All (Each of 5Marks)   (15)
(a)   Choose correct alternative in each of the following.   (5)
   (i)   Median can be determined using …
         (a)   Histogram   (b)   Frequency polygons
         (c)   ogives   (d)   None of the above
   (ii) If B is a subset of A then P(A/B)=
         (a)   1   (b)   P(A)
         (c)   P(B)   (d)   None of the above
   (iii) Temperature of a place is a … random variable.
         (a)   Discrete   (c)   Continuous
         (b)   Qualitative   (d)   None of these.
   (iv) Correlation coefficient lies between …and …
         (a)   -1 to 1   (c)   0 to 1
         (b)   O to 5   (d)   -1 to 0
   (v)   First raw moment is equal to …
         (a)   0   (b)   mean
         (c)   skewness   (d)   variance

(b)   Fill in the blanks   (5)
              (1/2,class intervals,most frequently,0, dependent)
   (i)   Mode is the …occurring value in the data set.
   (ii) For Y=a+bx, Y is called as… variable.
   (iii) In histogram the width of the class interval is defined on the basis of…
   (iv) If a coin is tossed then the probability of head and tail is…
   (v)   P(A∩ A')=…

(c)   Answer the following in one line   (5)
   (i)   Define percentile
   (ii)   Give any two merits of mode
   (iii) Mutually exclusive events
   (iv)   Sample space
   (v)   Define probability

Q.2)   Attempt **any THREE** of the following.   (15)
   (a)   What is stem and leaf display? Find stem and leaf display for the following
         data: 15,16,21,23,26,26,30,32,41,52,55
   (b)   Draw less than cumulative frequency curve for the following data:

Wages	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No of workers	1	3	11	21	43	32	9

         Hence find Q1(first quartile).
   (c)   Find coefficient of variation from the following data:

Age in years	10-20	20-30	30-40	40-50	50-60
No. of mobile users	8	12	20	14	10

(d) Define Arithmetic mean. Write any two merits and demerits for the same.

(e) Define mode. Calculate mode for the following data.

Class intervals	1-3	3-5	5-7	7-9	9-11
Frequency	110	120	116	108	100

(f) Write five requisites of good measures of central tendency.

Q.3) Attempt **any THREE** of the following.   (15)

(a) For the following data obtain the regression line of the type Y on X.

X	45	44	50	53	66	30	48
Y	42	40	41	42	56	30	43

(b) Define first four raw moments Also state the relationship between raw and central moments.

(c) Explain the concepts of correlation and regression.

(d) For the following distribution obtain the coefficient of Skewness.

Marks	20-30	30-40	40-50	50-60	60-70	70-80
No of students	5	20	14	10	8	5

(e) What is scatter diagram? Draw scatter diagram for Perfect positive and Perfect negative relationships.

(f) Write a short note on Skewness and Kurtosis.

Q.4) Attempt **any THREE** of the following.   (15)

(a) If an unbiased coin is tossed three times, find the probability
   i)   Of the event that getting exactly one head
   ii)   Of the event that getting at least two tails

(b) If given that P(A)=0.65, P(B)=0.3, P(A∩ B)=0.15. Find
   i)   P(A∩ B')   ii) P(A∪ B)   iii) P(A$' ∩ B'$)

(c) Prove that , i) P($\bar{A}$)=1-P(A)
   ii)   If A and B are two events such that A subset of B then P(A)≤P(B)

(d) Define conditional probability. A pair of dice is rolled. What is the probability that the sum of numbers showing on uppermost face is 8, given that both numbers are even?

(e) Let two objects are selected from a lot of 12 objects out of which 4 are defective, what is the probability that
   i)   None of the object selected is defective.
   ii)   At least one object is defective.

(f) State and prove Addition theorem.

Q.5) Attempt **any THREE** of the following.   (15)

(a) Calculate first two moments of the following data.
   i)   about mean   ii) about origin
   Data: 2,3,5,6,7

(b) Calculate the median for the following data.

Marks	5-10	10-15	15-20	20-25	25-30
Frequency	7	15	24	31	42

(c) Find the probability that a hand of five cards contains 4 cards of one kind.

(d) Explain the procedure of plotting Histogram with one example.

(e) Explain with one example qualitative data and quantitative data.