VCD 27/11/19 FYCS / Descriptive statistics and introduction to probability/ Sem-I

Marks: 75

Hours: 2½

Note : 1) All the questions are compulsory.

2) Figure to the right indicate marks

3) Illustrations, in-depth answers and diagrams will be appreciated.

4) Mixing of sun-questions is not allowed.

Q.1. Attempt all (each of 5 marks) **(15)**

a) Multiple choice questions: **(05)**

i) The point of introduction of the less than and the more than a give corresponds to

a) The mean b) the median c) the mode d) none of these

ii) 10 is the mean of a set of 7 observations and 5 is the mean of a set of 3 observations. The mean of a combined set is given by

a) 15 b) 10 c) 8.5 d) 7.5

iii) The karl pearson coefficient of correction between x and y is

a) $r(x,y) = \frac{cov(x,y)}{\sigma_x \sigma_y}$ b)) $r(x,y) = \frac{\sigma_x \sigma_y}{cov(x,y)}$

c) $r(x,y) = \sigma_x \sigma_y$ d) none of these

iv) For any frequency distribution, the kurtosis is

a) greater than 1 b) less than 1 c) equals to 1 d) none of these

v) Seem of all probabilities of a sample space is

a) 1 b) -1 c) 0 d) none of these

B) Fill in the blanks. **(05)**

i) _____ is affected very much by extreme values.

(mean, median, mode)

ii) _____ cannot be drawn for open ended class intervals.

(histogram, frequency polygon, both)

iii) Two independent variables are _____

(correlated, uncorrelated)

iv) It ons regression coefficient is greater than unify them the other must be _____

(greater than the first one, equal to unity, less than unity)

v) If P(A) P(B) P(C)= P(A∩B∩C) then the events A,B,C are _____

(Dependent, independent, mutually exclusive)

C) Short answers in 1-2 sentence. (05)

i) Define class boundary

ii) Define standard deviation

iii) Define Bivariate data

iv) Define conditional probability

v) Define kurtosis.

Q.2. Attempt the following (any three) **(15)**

a) Discuss the merits and demerits of mean and median.

b) Distinguish between the following with suitable example.

i) Less than and greater than or equal to frequencies.

ii) Exclusive and inclusive class interval

C) What are the requisites of a good measure of dispersion?

D) Find the mode of the following data.

Class:-	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency:-	5	8	7	12	28	20	10	10

E) Obtain the variance for the following data.

X:	22.5-27.5	27.5-32.5	32.5-33.5	37.5-42.5
f:	175	198	176	120

F) Write a short note on measure of central tendency.

Q.3. Attempt the following (any three) **(15)**

a) Explain the term skewness. Distinguish between positive and negative skewness.

b) Find the first four central moment's fir the following data.

x:	11	12	13	14	15	16	17
f:	2	9	25	35	20	8	1

c) Calculate the coefficient of correlation between x and y for the following data:-

x:	1	3	4	5	7	8	10
y:	2	6	8	10	14	16	20

d) State and prove the relationship between central moments and raw moments about origin.

e) The values of x and y are given. Find the regression series of the type y on x and x on y for the following.

x:	65	66	67	67	68	69	70	72
y:	67	68	65	68	72	72	69	71

f) What is scatter diagram? Draw scatter diagram for perfect positive and perfect negative correlation.

Q.4. Attempt the following. (any three) **(15)**

a) Define exhaustive events, trail, equity likely events, favorable events, sample space.

b) Two dice are thrown randomly. Find the probability that

i) The first die shows 6 ii) the total number on the dice is greater than 8

c) Let A and B be two events such that $P(A)=\frac{3}{4}$ and $P(B)=\frac{5}{8}$ show that

i) $P(A\cup B)\geq\frac{3}{4}$ ii) $\frac{3}{8}\leq P(A\cap B)\leq\frac{5}{8}$

d) The chances that doctor A will diagnose a disear x correctly is 60%. The chances that a patient wiil be die by his treatment after diagnosis is 40% and the chance of death by wrong diagnosis is 70%. A patient of doctor A who has disease x died. What is the chance that his disease was diagnosed correctly?

e) Write a short note on conditional probability.

f) Define probability. State all the axiomatic of probability.

Q.5. Attempt any three. **(15)**

a) Explain the procedure of plotting frequency curve with one example.

b) Define quartile deviation and write its merits and demerits.

c) Calculate karl pearson's coefficient of correlation for the following data.

Classes:	0-20	20-40	40-60	60-80	80-10
Frequency:	5	12	32	40	11

d) Write a short note on Kurtosis.

e) State all the properties of regression coefficients.

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