F.Y.B Sc Comp. Sci. Sem I Nov. 17
Descriptive Statistics & Introduction to Probability

Q. P. Code: 12213

(Time: 2½ Hours) [Total Marks: 75]

N.B. 1) All questions are compulsory.
2) Figures to the right indicate marks.
3) Illustrations, in-depth answers and diagrams will be appreciated.
4) Mixing of sub-questions is not allowed.
5) Use of own non-programmable calculator is allowed.

Q. 1 Attempt All(Each of 5Marks) **(15M)**

(a) Multiple choice questions

i. The range of correlation coefficient is .....
A. 0 to 1 B. -1 to 1 C. -1 to 0 D. None of the above

ii. If B is subset of A then p(A/B) = ...
A. 1 B. P(A) C. P(B) D. None of the above

iii. In less than type ogive curve, the points are plotted for .....
A. the lower boundary and frequency.
B. the upper boundary and cumulative frequency.
C. the lower boundary and cumulative frequency.
D. None of the above

iv. The measure of central tendency which can be used for further mathematical treatment is .....
A. Mean
B. Median
C. Mode
D. All the above

v. If the lower and upper limits of the class interval are 20 and 30 respectively then the class mark will be .....
A. 10 B. 50 C. 30 D. 25

(b) Fill in the blanks

i. Mode is the most frequently occurring value in data set.
ii. In histogram the width of the bar will be decided on the basis of Class interval.
iii. If the correlation coefficient between two variables X and Y is perfect then the correlation coefficient r = $r(x,y) = \sqrt{b_{xy} \cdot b_{yx}}$
iv. For Y = a + bx, Y is called as dependent variable.
v. $p(A \cap A') = 0$

(c) Short answers.

i. Write two requisites of good measure of central tendency. ① It should be rigidly defin
ii. Define variance. The square of S.D. is called variance. ② It should be base upon all the observation.
iii. Write the formula of regression coefficient of X on Y. $b_{xy} = \frac{cov(x,y)}{\sigma_y^2}$
iv. Define probability.
v. Define mutually exclusive events
If two or more

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Q. 2 Attempt the following (Any THREE)(Each of 5Marks) **(15M)**

(a) Explain with one example Nominal scale, Ordinal scale and ratio scale.

(b) Write a short note on

i. Frequency polygon.ii. Stem and leaf plot.

(c) Given the following data on the marks obtained by students in some examination.

22,24,15,25,10,12,14,8, 2, 4,

4,6,12,14,16,17,18,18,17,14,10,10,8,9,22,21,23,20,18.

Construct frequency distribution with inclusive type class interval.

(d) Obtain mean and mode for the following data

C.I.	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	2	4	7	5	4	3

(e) Explain the procedure of obtaining Quartile deviation for grouped data.

(f) Define standard deviation and Find coefficient of variation for the following dataX: 12,13,14,15,16,12,14,16,13,15,14,14,12

Measure of dispersion that depends on all the data item.

Q. 3 Attempt the following (Any THREE)(Each of 5Marks) **(15M)**

(a) Define first four raw moments about origin zero and central moments of a distribution.Also state the relationship between raw and central moments

(b) Explain the concept of skewness. Also distinguish between positive and Negative skewness.

(c) With usual notation $\mu_1=2$, $\mu_2=8$, $\mu_3=14$ and $\mu_4=50$ then Compute β_1 and β_2.

(d) Represent Positive,Negative and Perfect correlation using scatter plots.

(e) Explain the concept of correlation and regression. Also comment, how regression is different from correlation.

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

X	12	14	16	14	15	18
Y	2	4	7	5	4	3

Q. 4 Attempt the following (Any THREE)(Each of 5Marks) **(15M)**

(a) Define the Following with one example:

i. Random Experiment with one example.

ii. Sample space and Event with one example.

(b) A ticket is drawn from a box containing 30 tickets and a number on it is observed. Obtain the probability that ticket drawn has a number

i. Less than 6

ii. Greater than 20

iii. Multiple of 5.

(c) The letter of the word 'EQUATION' are arranged randomly. What is the probability that an arrangement

i. Starts and ends with vowel.

ii. Have all vowels together.

iii. State Addition theorem and Bay's theorem.

(d) State Addition Theorem and Bay's Theorem.

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(e) Two dice are thrown simultaneously. Find the probability that the sum being 6 or same number on both dice.

(f) A hospital has 3 doctors X,Y&Z operating independently. The probability that doctor X is available is 0.9 and that for Y is 0.6 and for Z is 0.7; What is the probability that at least one doctor is available when needed?

Q. 5 Attempt the following (Any THREE)(Each of 5Marks) **(15M)**

(a) Explain the procedure of plotting Bar chart and Pie Chart.

(b) Write two merits and two demerits of the Mode and Coefficient of range.

(c) Define Kurtosis and explain different types of kurtosis.

(d) Obtain Spearman's Rank correlation between performance in Maths and Computer Science. The scores are given below:

Maths	56	65	72	48	56	70	68
Computer Science	76	60	50	75	66	87	77

(e) If the two regression equations are $4y - 5x - 33 = 0$ and $20y - 9x - 107 = 0$, Find: - i. Mean of x and y ii. Correlation coefficient between x and y.

(f) Stockiest has 20 items in a lot. Out of which 12 are non-defective and 8 are defective. A customer selects 3 items from the lot. What is the probability that out of these three items:-

i. Three items are non-defective

ii. Two are non-defective and one is defective

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