TILAK MAHARASHTRA VIDYAPEETH, PUNE
BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
SPECIALIZATION IN CYBER SECURITY (CS)
EXAMINATION : DECEMBER - 2023
SEMESTER - II

Sub: Statistics (BCA – 240-18/BCA-240-20/BCA-CS-240-20)

Date : 30/12/2023   **Total Marks : 60**   **Time: 2.00 pm to 4.30 pm**

Instructions:
1. *All questions are compulsory unless and otherwise stated.*
2. *Bold figures to the right of every question are the maximum marks for that question.*
3. *Candidates are advised to attempt questions in order.*
4. *Answers written illegibly are likely to be marked zero.*
5. *Use of scientific calculators, Log tables, Mollier Charts is allowed.*
6. *Draw neat and labelled diagrams wherever necessary.*

Q.1. Solve (Any 4)   **(8)**

1. If the values of Mean and Mode of certain data are 101 and 100 respectively. Find the Median of the data.

2. Two groups of observations are there with Arithmetic Mean 30 & 20 respectively. Their standard Deviations are 4 and 6 respectively. Which of the two groups will me more consistent?

3. State True or False:
    (i)   Mean can be calculated graphically.
    (ii)   For a symmetric frequency distribution, Mean = Mode = Median = Standard Deviation.

4. For a certain data, the regression coefficient of the line Y on X is $-\left(\dfrac{3}{2}\right)$ and the regression coefficient of the line X on Y is $-\left(\dfrac{2}{3}\right)$. Find Karl Pearson`s correlation coefficient.

5. If the mean and variance of certain data are 9 and 36 respectively. Find its coefficient of Variation.

Q.2. Solve (Any 3)   **(9)**

1. Find the Arithmetic Mean for the following Data:

Classes	6-12	12-18	18-24	24-30	30-36
Frequencies	2	3	6	7	2

2. Find the Standard Deviation of the data given below:
    24,30,36,21,29,30,32,28,33,27.

3. Represent the following data with pie diagram:

Items	Food	Clothing	Transport	Education	Savings
Expenses	2400	900	1200	3000	1500

4. Write down the formulae for Laspeyre`s, Paasche`s and Fisher`s Index numbers. Also write down the uses of Index numbers.

Q.3. **Solve (Any 2)** (8)

1. The means of the two samples of sizes 20 and 10 are 45 and 24 respectively. Their standard deviations are 11 and 6 respectively. Obtain the standard deviation of sample size of 30 obtained by combining the two samples.

2. Find Mode and Median for the following data:

Classes	100-200	200-300	300-400	400-500	500-600
Frequencies	120	130	500	200	50

3. Find the correlation coefficient of the following data:
$$\sum(x-\bar{x})(y-\bar{y})=125, \ \sum(x-\bar{x})^2 = 250, \ \sum y(x-\bar{y})^2 =150 \text{ and }$$
No. of pairs pairs of X and Y= 25

Q.4. **Solve (Any 3)** (15)

1. Observe the data carefully and Answer the questions:

Collection (in thousand Rupees)	0-10	10-20	20-30	30-40	50-60
No. of vendors	12	15	24	36	13

   1) State the type of data classified in above table.
   2) Find the Median class of the data.
   3) Prepare the cumulative frequency tables of the data.
   4) The vendor, who collects Rs.30000 will belongs to which of the above classes?
   5) Find the value of 'h' in case of the modal class.

2. Find the number of pairs of X and Y if,
$$\sum x =\sum y =100, \ \sum x^2 =\sum y^2 =2250, \ \sum xy =1900 \text{ and } r = -0.4$$

3. Draw the oggive curves for the following data:

Classes	0-10	10-20	20-30	30-40	40-50
Frequencies	2	7	6	4	1

4. Write down all the steps for finding the lines of regression of the type X on Y & Y on X.

Q.5. **Solve. (Solve any 2)** (20)

1. IF the two lines of regressions are $2x+3y-8=0$ and $x+2y-5=0$.
   Determine the following :
   (i) Arithematic Mean of X and Arithematic Mean of Y.
   (ii) Karl Pearson`s correlation coefficient.
   (iii) $\dfrac{\sigma_x}{\sigma_y}$
   (iv) $\dfrac{\sigma_y}{\sigma_x}$

2. Represent the following data with appropriate bar diagrams:

Divisions	A	B	C	D	E
No. of passed students	15	25	30	13	35
No. of failed students	10	15	10	12	15

3.   Find : (i) Fishers Index number (ii) Price Index Number (iii) Quantity Index Nunber
for the following data:

Commodities	Base Year prices	Base Year Quantities	Current Year Prices	Current Year Quantities
P	12	20	15	25
Q	15	30	25	30
R	6	18	10	40
S	24	10	40	15

_____