(iv) Karl Pearson's coefficient of skewness lies between –3 and 3. (5,5,5)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 3574 **I**

Unique Paper Code : 2374001002

Name of the Paper : Introduction to Statistics

Name of the Course : **GE (NEP-UGCF) Offered by Department of Statistics**

Semester : I

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **Six** questions in all. Question No. **1** is compulsory.
3. Attempt **five** more questions, selecting at least **two** questions from each of **Sections A** and **B**.
4. Use of a non-programmable scientific calculator is allowed.

1. (a) (i) The geometric mean of 2, 4, 16 and 32 is _____ .

(ii) Median = _____ Quartile.

(iii) A portion of the population selected for study is referred to as a _____ .

(iv) In descriptive statistics, _____ gives a measure of peakedness of a dataset.

(v) If $\beta_2 > 3$, the distribution is said to be _____ .

(b) Define primary and secondary data.

(c) Find the arithmetic mean of the following frequency distribution :

x	1	2	3	4	5	6	7
f	5	9	10	15	17	8	6

7. (a) Define Yule's coefficient of association (Q) between two attributes A and B. Also prove $-1 \leq Q \leq 1$. When are the limits +1 and –1 attained? Interpret them.

(b) Can vaccination be regarded as a preservative measure for small-pox from the data given below?

'Of 1,482 persons in a locality exposed to small-pox, 368 in all were attacked.'

'Of 1,482 persons, 343 had been vaccinated and of these only 35 were attacked.' (8,7)

8. Write shorts notes on **any three** of the following :

(i) Measures of skewness

(ii) Coefficients of Dispersion

(iii) Kurtosis is greater than unity for any frequency distribution

(b) Eight coins were tossed together 256 times. The frequencies (f) that were obtained for different x, the number of heads, are shown in the following table. Calculate median, quartiles, 4^{th} decile and 27^{th} percentile.

x	0	1	2	3	4	5	6	7	8
f	1	9	26	59	72	52	29	7	1

(7,8)

SECTION B

6. (a) What do you mean by independence of attributes? Give a criterion of independence for attributes A and B.

(b) Given the following ultimate class frequencies, find the frequencies of positive class.

$(ABC) = 149$ $(AB\gamma) = 738$ $(A\beta C) = 225$

$(A\beta\gamma) = 1,196$ $(\alpha BC) = 204$ $(\alpha B\gamma) = 1,762$

$(\alpha\beta C) = 171$ and $((\alpha\beta\gamma) = 21,842$ (8,7)

(d) In a frequency distribution, the coefficient of skewness based upon quartiles is 0.6. If the sum of the upper and lower quartiles is 100 and the median is 38, find the value of upper and lower quartiles. A cyclist pedals from his house to his college at a speed of 10 km.p.h. and back from the college to his house at 15 km.p.h. Find the average speed.

(e) Following are the 2009 earnings (in thousands of dollars) before taxes for all six employees of a small company.

88.50 108.40 65.50 52.50 79.80 54.60

Calculate variance of the given data.

(f) The standard deviation of a symmetrical distribution is 5. What will be the value of the fourth moment about mean in order that the distribution be (i) Leptokurtic and (ii) mesokurtic.

(1×5,2,2,2,2,2)

P.T.O.

SECTION A

2. (a) Define and discuss the following terms :

(i) Quartile deviation

(ii) Mean deviation

(iii) Variance and

(iv) Coefficient of variation

(b) Define r^{th} central and r^{th} non-central moments. Calculate the first four moments about the mean and about an arbitrary value 25 for the following given data :

Class Interval	10-20	20-30	30-40	40-50
Frequency	2	4	3	1

(8,7)

3. (a) What is standard deviation? Explain its superiority over other measures of dispersion.

(b) Find the missing information for the following data

	Group-I	Group-II	Group-III	Combined
Number	50	?	90	200
Standard deviation	6	7	?	7.746
Mean	113	?	115	116

(8,7)

4. (a) Explain for what kind of frequency distribution an ogive is drawn. Explain its utility.

(b) Calculate (i) Quartile deviation (ii) Mean deviation from mean, for the following data :

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Students	6	5	8	15	7	6	3

(7,8)

5. (a) What do you understand by measures of central tendency? What are its chief measures? Explain how these are determined in case of frequency distribution?