| Student's Name | | Group No. | |
| Teacher's Name: | | Serial No. | |

Question	1	2	3	4	Total
Marks					

Instructions:
1.   Time allowed is 2 hours. Attempt all questions.
2.   This examination consists of 4 questions. There are 4 different pages.
3.   Answer on the page of the question. For additional space use the backside and indicate the question and the part numbers.

Q.1 (A) Against each statement, put a tick mark ($\sqrt{}$) if it is true and a cross ($\times$) if it is false. [Half mark for each]

(i) A measure obtained from the sample is called a statistic. --------------------------- (   )

(ii) The variable representing nationality is a quantitative variable. ------------------- (   )

(iii) Median is better than mean as a measure of central tendency when there is an

extreme value in the data set. --- (   )

(iv) The variance is negative if all data are negative. ------------------------------------ (   )

(v) If the events A and B are disjoint, then they are independent. ---------------------- (   )

Q.1 (B) Fill in blanks: [Half mark for each]

(i)   The events A and B are independent if
_____.

(ii)   The events A and B are disjoint (mutually exclusive) if
_____.

(iii)   If $P(A)=0.7$ and $P(A \cap B)=0.5$, then $P(A \cap B^c)=$_____.

(iv)   If the mean for X_1, X_2, and X_3 is 5 (kg), then the mean for $2X_1+1$, $2X_2+1$, and $2X_3+1$ is _____.

(v)   If the C.V.$=100\%$ and the variance $S^2=100$ (cm^2), the $\overline{X} = $ _____.

Q.2 The following are the weights (in kg) of 5 patients from a certain clinic: 79, 83, 60, 79, 90.

Find:

(i)   The sample mean [2 marks]

(ii)   The median [1 mark]

(iii)   The mode [1 mark]

(iv)   The sample standard deviation [2 marks]

(v)   The coefficient of variation (c.v.) [1 mark]

(vi)   Q.3 Suppose we measure the duration of labor (in hours) for a sample of pregnant women and obtained:

Duration (C. I.)	No. of Women (f)	mid-point (m)	R. F.
1 – 5	10		
6 – 10	30		
11 – 15	40		
16 – 20	20		
Total	100		

(a)   Complete the mid-point and relative frequency (R. F.) columns in the table. [2 marks]

(b)   Find approximate values for:

(i)   The sample mean: [1 mark]

(ii)   The sample variance: [2 marks]

(iii)   The coefficient of variation (c.v.): [1 mark]

(c)   Compare the variability of data in Q(2) with that of data in Q(3). [1 mark]

(d) Construct a frequency histogram [2 marks]

Q.4 Suppose that 80% of the patients in a particular hospital are male (M), 50% are smokers (S), and 40% are male smokers. If one patient is selected randomly,

   (a) Construct a two-way table giving all probabilities. [2 marks]

   (b) Find the probability that the patient selected is not smoker. [1 mark]

   (c) Find the probability that the patient selected is male or smoker. [1 mark]

   (d) Find $P(M^c \cup S)$. [1 mark]

   (e) If it is known that the patient selected is smoker, what is the probability that the patient is male. [2 marks]

   (f) Does knowing the patient is smoker have an affect on the probability of being male (i.e., are the events M and S independent)? Explain. [2 marks]