Roll No. .....

Y – 3645

B.C.A. (Sixth Semester) EXAMINATION,

May/June-2021

Paper – 601

PROBABILITY & STATISTICS

Time : Three Hours

Maximum Marks : 80 *Minimum Pass Marks : 32*

Note—Attempt *all* questions. Each question carries equal marks.

Unit-I

1. (a) Show that the algebraic sum of the deviation of all the variety values from their arithmetic mean is zero.

(b) Compute the mode of the following data—

Midvalue	15	20	25	30	35	40	45	50	55
Frequency	2	22	19	14	3	4	6	1	1

Unit-II

2. (a) Calculate first three moments about 90 from the following frequency distribution—

x	82	88	90	91	92	95	97
f	7	11	15	8	4	3	2

(b) For any two events A and B, prove that

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

Unit-III

3. (a) Find whether the following function is probability density function :

$$f(x) = \begin{cases} x, & 0 \le x \le 1 \\ 2x, & 1 \le x \le 2 \end{cases}$$

(b) A perfect cubical die is thrown a large number of times in set of 8. The occurrence of 5 or 6 is called a success. In what proportional of the sets you expect 3 successes.

Unit-IV

4. (a) Calculate the value of r in case of the following data :

x	11	10	9	8	7	6	5
y	20	18	12	8	10	5	4

(b) Calculate Karl Pearson's correlation coefficient between x and y using short cut method.

x	2	5	7	9	19	17
y	25	27	26	29	34	35

Unit-V

5. (a) Write short notes on the following—

(i) Hypothesis

(ii) Alternative hypothesis

(b) Show that in a 2×2 contingency table $\begin{array}{c|c} a & b \\ \hline c & d \end{array}$

$$\chi^2 = \frac{(a+b+c+d)(ad-bc)^2}{(a+b)(c+d)(b+d)(a+c)}$$