U-3725

B.C. A. (Sixth Semester)

EXAMINATION, May/June, 2018

Paper-I

PROBABILITY AND STATISTICS

Time : Three Hours

Maximum Marks : 80 (For Regular Students)

Minimum Pass Marks : 32

Note-Attempt all questions. Solve any two parts from each question. All questions carry equal marks.

Unit - I

1. (a) Write short notes on the following-

(i) Histogram (ii) Cumulative frequency distribution.

(b) Find Mean of the following data-

Age (in years)	No. of students
10 - 19	1
20 – 29	0
30 - 39	1
40 - 49	10
50 - 59	17
60 - 69	38
70 - 79	9
80 - 89	3

(c) Calculate the coefficient of variation of the following distribution:

x	Frequency
102	3
106	9
110	25

114	35
118	17
122	10
126	01

Unit - II

2. (a) Compute the first three moments about mean from the following data

Class interval	Frequency
0 - 10	1
10 - 20	3
20 – 30	4
30 – 40	2

(b) Find the moment generating function of the random variable 'X' having p.d.f.

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

(c) Three horses A, B and C are in a race. A is twice as likely to win as B and B is twice as likely to win as C. What are the respective probabilities of winning?

Unit - III

3. (a) Find the value of λ a for which the function is p.d.f. if

$$f(x)=\begin{cases} \lambda x^2, & 0\le x\le 3 \\ 0, & \text{otherwise} \end{cases}$$

Also compute P(1≤ x ≤ z).

(b) In a Poisson distribution, prove that mean and variance are same.

(c) Explain normal distribution and its properties.

Unit - IV

4. (a) Calculate the Karl Pearson's correlation coefficient between x and y:

x	y
150	65

153	**66**
154	**67**
155	70
157	68
160	53
163	70
164	63

(b) If 4x-5y + 33 = 0 and 20.x - 9y = 107 are two lines of regression. Find

(i) Mean value of x and y

(ii) Regression coefficients

(iii) Correlation coefficients.

(c) Fit a parabolic curve of regression of yon x to the following data

x	y
1.0	1.1
1.5	1.3
2.0	1.6
2.5	2.0
3.0	2.7
3.5	3.4
4.0	4.1

Unit- V

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

(i) Null and alternative hypothesis.

(ii) Errors of Kind I and Kind II.

(b) From the table given below, whether the colour of son's eyes is associated with that of father's eyes ? Given that the value of chi-square for 1 d.f at 5% level of significance is 3.841.

Eye colour son's

Eye colour of father		Not light	Light
	Not light	230	148
	Light	151	471

(c) In a test given two groups of students drawn two normal populations, the marks obtained were as follows

Group B	Group A
18	29
20	28
36	26
50	35
49	30
36	44
34	46
49	
41	

Examine at 5% level of significance, whether the two populations have the same variance. (Given that

$F_{0.05, (8,6)} = 4.15$)