

This question paper contains 4+2 printed pages +1 table attached]

Your Roll No.....

7601

B.A. Prog./III

D-I

APPLICATION COURSE : BASIC STATISTICS

Time : 3 Hours

Maximum Marks : 100

(Write your Roll No. on the top immediately on receipt of this question paper.)

Question No. 1 is compulsory. Attempt any *four* questions from-

Question Nos. 2 to 7, selecting at least *one* question form each

section and give full explanation for each question.

Makrs are indicated against each question.

Use of simple calculator is allowed.

1. Short answers with proper justification are expected in all the five parts of this question. Each part is of 4 marks : $4 \times 5 = 20$

(i) Write a short note on Kurtosis.

P.T.O.

- (ii) One patient's blood pressure, measured daily over several weeks, averaged 182 with a standard deviation of 12.6, while that of another patient averaged 124 with a standard deviation of 9.4. Which patient's blood pressure is relatively more variable ?
- (iii) A die is thrown at random. What is the expectation of numbers on it ?
- (iv) If the values of the joint probability distribution of X and Y are as shown in the table :

		x		
		0	1	2
y	0	$1/6$	$1/3$	$1/12$
	1	$2/9$	$1/6$	
	2	$1/36$		

Find :

- (i) $P(X \leq 1, Y \leq 1)$
- (ii) $P(X = 0, Y = 2)$
- (v) A team of efficiency experts intends to use the mean of a random sample of size $n = 150$ to estimate the average mechanical aptitude of assembly-line workers in a large industry. If based on experience the experts can assume that $\sigma = 6.2$ for such data, what can they assert with probability 0.99 about the maximum error of their estimate ? (Given : $Z_{0.025} = 1.96, Z_{0.005} = 2.58$)

Section I

2. Calculate Quartile Deviation : 20

Marks	No. of Students
0—10	6
10—20	5
20—30	8

P.T.O.

30—40	15
40—50	7
50—60	6
60—70	3

3. The following are the number of hours, in the morning (X) and in the afternoon (Y) it took engineers to complete a task. Calculate the correlation between X and Y and interpret : 20

X	Y
2	6
3	5
6	3
5	5
4	6

Section II

4. In a test on 2000 electric bulbs it was found that the life of a particular make, was normally distributed with an average life of 2040 hours and S.D. of 60 hours. Estimate the number of bulbs likely to burn for :

(a) more than 2150 hours

(b) less than 1950 hours and

(c) between 1920 and 2160 hours. 20

5. The number of accidents in a year attributed to taxi drivers in a city follows Poisson distribution with mean 3. Out of 1000 taxi drivers, find approximately number of drivers with :

(a) no accidents in a year

(b) more than 3 accidents in a year.

($e^{-3} = 0.050$, $e^3 = 20.09$) 20

Section III

6. A random sample of 400 flower stems has an average length of 10 cm. Can this be regarded as a sample from a large population with mean 10.2 cm and a standard deviation of 2.25 cm ?
- (Given : $Z_{0.05} = 1.96$, $Z_{0.01} = 2.58$). 20
7. A random sample of 16 emergency reports was selected from the files of an ambulance service. The mean time required for ambulance to reach their destination was 13 minutes. Assume that the population of times is normally distributed with a variance of 9. Can we conclude at the 0.05 level of significance that the population mean is greater than 10 minutes ?
- (Given : $t_{0.05,14} = 1.761$, $t_{0.05,15} = 1.753$, $t_{0.05,16} = 1.746$) 20

