

UNIT – IV

8. (a) In two large populations, there are 30% and 25% respectively, of fair-haired people. In this difference likely to be hidden in samples of 1200 and 900 respectively, from the two populations.
- (b) A sample of 100 electric bulbs produce by a manufacture A showed a mean life time of 1190 hours and a standard deviation of 90 hours. A sample of 75 bulbs produced by manufacturer B showed a mean life time of 1230 hours with a standard deviation of 120 hours. Is there a difference between the mean life time of the two brands at significance levels of 5% and 1%.

9. Fit a binomial distribution to the data :

$x:$	0	1	2	3	4	5
$y:$	38	144	342	287	164	25

and test for goodness-of-fit at the level of significance 0.05.

Roll No.

3016

B. Tech. 2nd Semester (CSE)
Examination – July, 2021

MATH-II (PROBABILITY & STATISTICS)

Paper : BSC-MATH-104-G

Time : Three Hours]

[Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting one question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

- (a) Define continuous random variable and probability measure.
- (b) Explain probability mass function.
- (c) Explain properties of continuous distribution function.

- (d) Evaluate mean of Poisson's distribution.
- (e) The mortality rate for a certain disease is 6 per 1000. What is the probability for just four death from that disease in a group of 400.
- (f) Explain measures of Kurtosis.

UNIT - I

2. (a) Let x and y be random variable such that :

$$f(x, y) = \begin{cases} k(2x+y) & \text{for } 0 < x < 1, 0 < y < 2 \\ 0 & \text{elsewhere} \end{cases}$$

be a joint probability density function. Find the value of k .

- (b) Explain Bernoulli trials.

3. State and prove Chebyshev's Inequality.

UNIT - II

4. (a) Show that the function $f(x) = \begin{cases} e^{-x} & \text{for } x \geq 0 \\ 0 & \text{for } x < 0 \end{cases}$ a probability density function and find :

- (i) $P[1 \leq x \leq 2]$ (ii) $F(2)$

3016-2650-(P-4)(Q-9)(21) (2)

- (b) A bag X contains 2 white, 3 red balls and bag Y contains 4 white, 5 red balls. One ball is drawn at random from one of the bags and it is found to be red. Find the probability that it was drawn from bag Y.

5. State and prove Distribution of Quotient of two random variables.

UNIT - III

6. (a) The following table shows the marks obtained by 100 candidates in an examination. Calculate the mean, median and standard deviation :

Marks obtained	1-10	11-20	21-30	31-40	41-50	51-60
No. of candidates	3	16	26	31	16	8

- (b) A bag contains five white, seven black and eight red balls. A ball is drawn at random. What is the probability that it is a red ball or a white ball ?

7. (a) A coin is tossed five times. What is the probability of getting at least three heads.

- (b) Fit a Poisson distribution of the following data :

x	0	1	2	3	4
f	122	60	15	2	1

3016-2650-(P-4)(Q-9)(21) (3)

P. T. O.