SHREE NARAYANA COLLEGE OF COMMERCE
AHMEDABAD

Name of the Department: Statistics
Subject: Probability and Discrete Probability Distribution
Class & Semester: C Division (Semester- II)
Faculty Name: Dr.Neeta M.Mandaliya

ASSIGNMENT

SECTION – 1 (UNIT – 1)

Enlist: Probability

(I) Explain the following terms (any four):
- (a) Random experiment
- (b) Exhaustive event
- (c) Intersection events
- (d) Independent even
- (e) Difference events

(II) A group consists of 4 men and some women. If the of selecting 2 men from them is 2/15 find the number of women in the group.

(III) Three Machines A, B and C produces 15%, 55% and 30% of items daily in a factory. The percentage of defective items of these machines are respectively 4%, 5% and 6%. An item is taken at random from the production and is found to be defective. Find the probability that it is produced by machine A.

SECTION – 2 (UNIT – 2)

Enlist: Mathematical Expectation

(I) What is probability Distribution? State its main properties.

(II) The probability distribution of a random variable x is as follows:

x_i	-1	0	1	2	3	4
P (x_i)	$\frac{1}{6}$	$\frac{1}{3}$	p	p	$\frac{1}{12}$	$\frac{1}{12}$

Find the value of p and also obtain mean and variance of x.

(III) There are 5 tickets in a box numbered 1,1,2,2,2 respectively. Two tickets are taken at random from it, find the expectation of total of the numbers on the tickets.

SECTION – 3 (UNIT – 3)

Enlist: Discrete Distribution -I (Poisson Distribution and Hyper geometric distribution)

(I) Give the properties of Poisson distribution.

(II) For a Poisson variate x, P($x = 1$)= P(x=2) Prove that P($x = 4$)=$\frac{2}{3}e^{-2}$

(III) In the production of electric fuses 2% are defective. Find the probability of getting (i) all non-defective fuses in a box containing 200 fuses. (ii) at the most 2 defective fuses (iii) 3 defective fuses (e^{-4}= 0.0183)

(IV) Fit a Poisson distribution to the following data:

x	0	1	2	3	4
f	110	65	21	3	1

($e^{-0.6}$=0.5488)

(V) Give the properties of Hyper Geometric distribution.

(VI) There are 40 screws in a packet of which 5 are defective. If 10 screws are taken at random from the packet, find the probability that none of them is defective. Also find mean and variance of defective screws.

SECTION – 4 (UNIT – 4)

Enlist: Discrete Distribution -II (Negative Binomial distribution and Geometric distribution)

(I) State the probability mass function of geometric distribution State its properties and uses.

(II) State the probability mass function of negative binomial distribution. State its properties and uses.

(III) The probability that a person can hit a target in any trials 0.7. Find the probability that a person can hit the target third time at the eighth trial.

(IV) In a lot of apples there are 20% are sour. Find the probability that a person gets third sweet apple when fifth apple is tested.

(V) In an objective test 3 alternatives are given in each question and of them only one is correct. A student ticks any one of the answers at random. Find the probability that his first answer will be correct at fourth trial

SECTION – 5 (REVISION & PRACTICE)

Question:

From Unit 1 to Unit 4, draft the following:

(I) What is the probability of having 5 saturaday in a February of a leap year?

(a) 0.2
(b) 0.3
(c) $\frac{4}{10}$
(d) $\frac{1}{7}$

(II) In usual notations, P(U)= ____ and P(∅)= ___

(a) (0,1)
(b) (0,0)
(c) (0.5,0.5)
(d) (1,0)

(III) For a random variable x, E(x)= 2, find the values of E(3 x)=

(a) 2
(b) 3
(c) 0
(d) 6

(IV) If x and y are two independent random variables,E($x + y$)= _____

(a) E(y)

(b) E(x)
(c) E xy
(d) E(x)+E(y)

(V) The Mean of Poisson distribution 1.44 its Variance=_____
(a) 1
(b) 0.44
(c) 0
(d) 1.44

(VI) In a Poisson distribution P(0)=
(a) 0
(b) 1
(c) M
(d) e^{-m}

(VII) Hypergeometric distribution is a _____ random variable.
(a) Continuous
(b) Discrete
(c) 1
(d) None of these

(VIII) Mean of Hypergeometric distribution_____
(a) M
(b) N
(c) R
(d) $\frac{mr}{m+n}$

(IX) When n =__ negative binomial distribution becomes geometric distribution.
(a) 0
(b) 2
(c) -1
(d) 1

(X) In which distribution variance is greater than mean.
(a) Poisson distribution
(b) Hypergeometric distribution
(c) Geometric distribution
(d) Negative binomial distribution