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Designation: Professor & Head

Department: Mathematics,

LNCT&S, Bhopal (M.P)

Assignment-5

Subject: Mathematics-III

(BT-401)

(Common to CS/IT/EX/EE)

Topic: Concept of Probability

1. Define Concept of probability, probability of mass function, probability density function, Discrete distribution, Gamma distribution, Beeta distribution, Exponential distribution.
2. Given A and B two events with $P(A \cup B)=\frac{7}{8}, P(A \cap B)=\frac{1}{4}$ and $P(A \cup \overline{B})=\frac{5}{8}$. Find $P(A)$ and $P(B)$.
3. Find mean and variance of Binomial distribution, Poisson's distribution, Normal distribution.
4. Prove that the mean deviation about the mean of Normal distribution is 4/5 times the standard deviation.
5. Prove that in a normal distribution, all the moments of odd order about the mean vanishes.
6. Show that in a Poisson's distribution with unit mean and mean deviation about the mean is 2/3 times the standard deviation.
7. In a certain factory turning razor blades, there is a small chance (1/1500) for any blade to be defective. The blades are in packets of 10. Use Poisson's distribution to calculate the approximate number of packets containing no defective, one defective and two defective blades respectively in a consignment of 10,000 packets.
8. The probability that a bomb dropped from a plane will strike the target is 1/5. If six bombs are dropped, find the probability that
   (i) Exactly two will strike the target and (ii) at least two will strike the target.
9. If 10% of the bolts produced by a machine are defective. Determine the probability that out

of 10 bolts chosen at random.

10. The sum and the product of mean and variance of binomial distribution are 24 and 128. Find the distribution.
(i) One (ii) none (iii) at most two bolts will be defective.

11. In a Normal distribution, 31% of the items are under 45 and 8% are above 64. Find the mean and standard deviation.

12. Fit a Poisson's distribution to following data and calculate theoretical frequency.

Deaths	0	1	2	3	4
Frequencies	122	60	15	2	1

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