

### Assignment for performance improvement.

#### Question: 1. Answer in Short

- Three unbiased coins are tossed. Find the probability of getting exactly two heads.
- If  $A$  and  $B$  are two events such that  $P(A)=0.3$ ,  $P(B)=0.4$  and  $P(A \cap B) = 0.2$  then find  $P(A \cup B)$ .
- What is the probability of getting at least one head if two unbiased coins are tossed?
- If  $A$  and  $B$  are mutually exclusive then what is  $P(A \cap B)$  ?
- A fair die is thrown then what is the probability of getting at most 2?
- If  $P(E) = 0.05$ , what is the probability of 'not E'?

#### Question: 2.

- Three boxes namely  $B_1$ ,  $B_2$  and  $B_3$  contain 10%, 20% and 30% of defective joints respectively. A joint is selected at random which was found defective then determine the probability that it comes from (i) box  $B_1$  and (ii) box  $B_2$ .
- A random variable  $X$  has following probability distribution. Find (1)  $k$  (2)  $P(X < 2)$  (3)  $P(X > 0)$   
 (4) Cumulative distribution function.

$X$	0	1	2
$P(X=x)$	$K$	$2k$	$3k$

- Calculate the first 4 central moments for the following probability distribution:

$X$	1	2	3	4	5	6	7	8
$p(X)$	0.008	0.032	0.142	0.216	0.240	0.206	0.143	0.013

#### Question: 3

- What is the probability that a standard normal variate  $Z$  will be  
 (i) Greater than 1.09 (ii) Less than or equal  $-1.65$   
 (iii) Lying between  $-1$  and  $1.96$  (iv) lying between  $1.25$  and  $2.75$
- If a random variable has a Poisson distribution such that  $P(X = 1) = P(X = 2)$ ,  
 find (i) the mean of the distribution, (ii)  $P(X \geq 1)$ , (iii)  $P(1 < X < 4)$
- The mileage that car owners get with a certain kind of radial tire is a random variable having an exponential distribution with a mean of  $4000$  km. Find the probabilities that one of these tires will last (i) at least  $2000$  km and (ii) at most  $3000$  km.
- Two dice are thrown five times. Find the probability of getting the sum as 7 at least once.