



**Q.1. Solve the following: (6x5=30)**

- i. Define mutually exclusive events and independent event with example.
- ii. In a bridge hand of 13 cards. Find the probability that all four kings and all four Queens are selected.
- iii. For what value of K, the function  $f(x)$  defined below may be a density function

$$f(x) = Kx, \quad 0 \leq x \leq 2$$
$$= 0, \quad \text{elsewhere.}$$

- iv. Define hyper geometric probability distribution.
- v. If the probability that a person will believe a rumour is 0.25 What is the probability that the sixth person to hear the rumour will be the first to believe it.
- vi. If  $x$  is  $N(-7, 16)$ . Write down its moment generating function.

**Q.2. Solve the following: (3x10=30)**

- i. A card is drawn at random from a deck of 52 cards. What is the probability that it is a diamond, a face or a king card?
- ii. Drive the mean, variance and recurrence formula of Poisson distribution.
- iii. The mean height of soldiers is 68.22 inches with a variance of 10.8 inches. Assuming the distribution of heights to be normal, how many soldiers in a regiment of 1000 would you expect to be over 6 feet tall?