Question: 10.13.3.10

Yash Patil - EE22BTECH11058

Question: All the jacks, queens and kings are removed from a deck of 52 playing cards. The remaining cards are well shuffled and then one card is drawn at random. Giving ace a value 1 similar value for other cards, find the probability that the card has a value

1) 7
2) greater than 7
3) less than 7

Solution: Number of cards left after removing all jacks, queens and kings(=N)

$$= 52 - 4 \times 3 \tag{1}$$

$$= 40 \tag{2}$$

For any given random variable X ranging from 1 to 10, the number of cards favouring the event(n) = 4
$\therefore$ probabilty for the random vector, P_X in range 1 to 10 = $\frac{n}{N} = 0.1$

X	P_X
X < 7	$\sum_{X=1}^{6} P_X$
X = 7	P_7
X > 7	$\sum_{X=8}^{10} P_X$

1) Probability to find a card with value equal to 7

$$= P_X, X = 7 \tag{3}$$

$$= 0.1 \tag{4}$$

2) Probability to find a card with value greater than 7

$$= \sum_{X=8}^{10} P_X \tag{5}$$

$$= 3 \times 0.1 \tag{6}$$

$$= 0.3 \tag{7}$$

3) Probability to find a card with value lesser than 7

$$= \sum_{X=1}^{6} P_X \tag{8}$$

$$= 6 \times 0.1 \tag{9}$$

$$= 0.6 \tag{10}$$