SECTION-A   2 x 4 = 8

1) A card is lost from a pack of 52 cards. From the remaining cards two cards are drawn at random.

Based on the above information, answer the following questions.

(i) The probability of drawing two diamonds, given that a card of diamond is missing, is

a) $\frac{21}{425}$ (b) $\frac{22}{425}$ (c) $\frac{23}{425}$ (d) None of these

(ii) The probability of drawing two diamonds, given that a card of heart is missing, is

a) $\frac{26}{425}$ (b) $\frac{22}{425}$ (c) $\frac{19}{425}$ (d) $\frac{23}{425}$

(iii) Let A be the event of drawing two diamonds from remaining 51 cards and E_1, E_2, E_3 and E_4 be the events that lost card is of diamond, club, spade and heart respectively, then the approximate value of $\sum_{i=1}^{4} P(A \mid E_i)$ is

a) 0.17 (b) 0.24 (c) 0.25 (d) 0.18

(iv) All of a sudden, missing card is found and, then two cards are drawn simultaneously without replacement. Probability that both drawn cards are king is

a) $\frac{1}{52}$ (b) $\frac{1}{221}$ (c) $\frac{1}{121}$ (d) $\frac{2}{221}$

(v) If two cards are drawn from a well shuffled pack of 52 cards, one by one with replacement, then probability of getting not a king in 1st and 2nd draw is

a) $\frac{144}{169}$ (b) $\frac{12}{169}$ (c) $\frac{64}{169}$ (d) None of these

Answer : **(i) (b):** Required probability $= \dfrac{^{12}C_2}{^{51}C_2}$

$= \dfrac{12\times 11}{51\times 50} = \dfrac{22}{425}$

(ii) (a): Required probability $= \dfrac{^{13}C_2}{^{51}C_2} = \dfrac{13\times 12}{51\times 50} = \dfrac{26}{425}$

(iii) (b): Clearly, $P(A \mid E_1) = \dfrac{^{12}C_2}{^{51}C_2} = \dfrac{22}{425}$

$$P(A \mid E_2) = \dfrac{^{13}C_2}{^{51}C_2} = \dfrac{26}{425}$$

$$P(A \mid E_3) = P(A \mid E_4) = \dfrac{26}{425}$$

$$\therefore \sum_{i=1}^{4} P(A \mid E_i) = \dfrac{22}{425} + \dfrac{26}{425} + \dfrac{26}{425} + \dfrac{26}{425} = \dfrac{100}{425} = 0.24$$

(iv) (b): P(getting both king) $= \dfrac{^{4}C_2}{^{52}C_2} = \dfrac{4\times 3}{52\times 51} = \dfrac{1}{221}$

(v) (a): P(drawing a king) $= \dfrac{4}{52} = \dfrac{1}{13}$

$$\therefore \quad P(\text{ not drawing a king }) = 1 - \dfrac{1}{13} = \dfrac{12}{13}$$

$$\therefore \quad \text{Required probability } = \dfrac{12}{13} \times \dfrac{12}{13} = \dfrac{144}{169}$$

2) In a bilateral cricket series between India and South Africa, the probability that India wins the first match is 0.6. If India wins any match, then the probability that it wins the next match is 0.4, otherwise the probability is 0.3. Aso, it is given that there is no tie in any match

Based on the above information answer the following questions.
(i) The probability that India won the second match, if India has already loose the first match is
(a) 0.5 (b) 0.3 (c) 0.4 (d) 0.7
(ii) The probability that India losing the third match, if India has already loose the first two matches is
(a) 0.2 (b) 0.3 (c) 0.4 (d) 0.7
(iii) The probability th-.at India losing the first two matches is
(a) 0.12 (b) 0.28 (c) 0.42 (d) 0.01
(iv) The probability that India winning the first three matches is
(a)   (b)   (c)   (d)
0.92   0.96   0.94   0.096
(v) The probability that India winning exactly one of the first three matches is
(a)   (b)   (c)   (d)
0.205   0.21   0.408   0.312

Answer : **(i) (c):** It is given that if India loose any match, then the probability that it wins the next match is 0.3.
∴ Required probability $= 0.3$
(ii) (d): It is given that, if India loose any match, then the probability that it wins the next match