8. PROBABILITY

PREVIOUS EAMCET BITS

1. If A and B are events of a random experiment such that $P(A \cup B) = \frac{4}{5}, P(\bar{A} \cup \bar{B}) = \frac{7}{10}$ and $P(B) = \frac{2}{5}$, then $P(A) =$ **[EAMCET 2009]**

   1) $\frac{9}{10}$ 2) $\frac{8}{10}$ 3) $\frac{7}{10}$ 4) $\frac{3}{5}$

   Ans: 3

Sol: $P(\overline{A \cap B}) = \frac{7}{10} \Rightarrow P(A \cap B) = \frac{3}{10}$

$\therefore P(A \cup B) = P(A) + P(B)$

$P(A \cap B) \Rightarrow P(A) = \frac{7}{10}$

2. The probability of choosing randomly a number c from the set {1, 2, 3, …9} such that the quadratic equation $x^2 + 4x + c = 0$ has real roots is : **[EAMCET 2009]**

   1) $\frac{1}{9}$ 2) $\frac{2}{9}$ 3) $\frac{3}{9}$ 4) $\frac{4}{9}$

   Ans: 4

Sol: $\Delta \geq 0, \Rightarrow C \leq 4$

$\therefore E = \{1, 2, 3, 4\}$ & $P(E) = \frac{4}{9}$

3. Suppose that E_1 and E2 are two events of a random experiment such that $P(E_1) = \frac{1}{4}, P\left(\frac{E_2}{E_1}\right) = \frac{1}{2}$ and $P\left(\frac{E_1}{E_2}\right) = \frac{1}{4}$, observe the lists given below : **[EAMCET 2009]**

List – I	List – II
(A) $P(E_2)$	(i) 1/ 4
(B) $P(E_1 \cup E_2)$	(ii) 5/8
(C) $P(\bar{E}_1 / \bar{E}_2)$	(iii) 1/8
(D) $P(E_1 / \bar{E}_2)$	(iv) 1/2
	(v) 3/8
	(vi) ¾

	A	B	C	D		A	B	C	D
1)	ii	iii	vi	i	2)	iv	v	vi	i
3)	iv	ii	vi	i	4)	i	ii	iii	iv

Sol: Ans : 3

$$P\left(\frac{E_2}{E_1}\right) = \frac{1}{2} \Rightarrow \frac{P(E_1 \cap E_2)}{1/4} = \frac{1}{2}$$

$$\Rightarrow P(E_1 \cap E_2) = \frac{1}{8} \,\&\, P\left(\frac{E_1}{E_2}\right) = \frac{1}{4}$$

$$\Rightarrow P(E_2) = \frac{1}{2}$$

4. If A and B are independent events of a random experiment such that

$P(A \cap B) = \frac{1}{6}$ and $P(\bar{A} \cap \bar{B}) = \frac{1}{3}$, then $P(A) =$ **[EAMCET 2008]**

1) $\frac{1}{4}$ 2) $\frac{1}{3}$ 3) $\frac{3}{4}$ 4) $\frac{2}{3}$

Ans:2

Sol: Let $P(A) = x$ and $P(B) = y$

$$P(A \cap B) = \frac{1}{6} \Rightarrow P(A)P(B) = \frac{1}{6} \Rightarrow xy = \frac{1}{6}$$

$$P(\bar{A} \cap \bar{B}) = \frac{1}{3} \Rightarrow P(\bar{A})P(\bar{B}) = \frac{1}{3} \Rightarrow [1 - P(B)] = \frac{1}{3} \Rightarrow (1-x)(1-y) = \frac{1}{3}$$

$$\Rightarrow 1 - x - y + xy = \frac{1}{3} \Rightarrow 1 - x - y + \frac{1}{6} = \frac{1}{3} \Rightarrow x + y = \frac{5}{6} \Rightarrow y = \frac{5}{6} - x$$

$$xy = \frac{1}{6} \Rightarrow x\left(\frac{5}{6} - x\right) = \frac{1}{6} \Rightarrow x(5 - 6x) = 1 \Rightarrow 6x^2 - 5x + 1 = 0 \Rightarrow (2x-1)(3x-1) = 0$$

$$\Rightarrow x = \frac{1}{2} (\text{or}) \frac{1}{3}$$

5. Let S be the sample space of the random experiment of throwing simultaneously two unbiased dice with six faced (numbered 1 to 6) and let $E_k = \{(a,b) \in S : ab = k\}$ for $k \geq 1$ **[EAMCET 2008]**

1) $p_1 < p_{30} < p_4 < p_6$ 2) $p_{36} < p_6 < p_2 < p_4$ 3) $p_1 < p_{11} < p_4 < p_6$ 4) $p_{36} < p_{11} < p_6 < p_4$

Ans:1

Sol: $p_1 = P(E_1) = P[\{(a,b)/ab = 1\}] = P[\{(1,1)\}] = 1/36$

$$p_2 = P(E_2) = P[\{(a,b)/ab = 2\}] = P[\{(1,2),(2,1)\}] = 2/36$$

$$p_4 = P(E_4) = P[\{(a,b)/ab = 4\}] = P[\{(1,4),(2,2),(4,1)\}] = 3/36$$

$$p_6 = P(E_6) = P[\{(a,b)/ab = 6\}] = P[\{(1,6),(2,3),(3,2),(6,1)\}] = 4/36$$

$$p_{11} = P(E_{11}) = P[\{(a,b)/ab = 11\}] = P[\phi] = 0$$

$$p_{30} = P(E_{30}) = P[\{(a,b)/ab = 30\}] = P[\{(5,6),(6,5)\}] = 2/36$$

$$p_{36} = P(E_{36}) = P[\{(a,b)/ab = 36\}] = P[\{(6,6)\}] = 1/36 \ \therefore p_1 < p_{30} < p_4 < p_6$$

6. For K = 1, 2,3 the box B_k contains k red balls and (k +1) white balls. Let $P(B_1)=\frac{1}{2}, P(B_2)=\frac{1}{3}, P(B_3)=\frac{1}{6}$. A box is selected at random and a ball is drawn from it. If a red ball is drawn, the probability that it has come from box B_2 is **[EAMCET 2008]**

1) $\frac{35}{78}$ 2) $\frac{14}{39}$ 3) $\frac{10}{13}$ 4) $\frac{12}{13}$

Ans:

Sol: Let E be the event of drawing red ball from the selected box.

$$P\left(\frac{E}{B_1}\right)=\frac{1}{2}, P\left(\frac{E}{B_2}\right)=P\left(\frac{E}{B_3}\right)=\frac{3}{4}$$

$$P\left(\frac{B^2}{E}\right)=\frac{P(B_2)P(E\setminus B_2)}{P(B_1)P(E\setminus B_1)+P(B_2)P(E\setminus B_2)+P(B_3)P(E\setminus B_3)}$$

$$\frac{(1/3)(2/3)}{(1/2)(1/2)+(1/3)(2/3)+(1/6)(3/4)}=\frac{2/9}{1/4+2/9+1/8}=\frac{2}{9}\times\frac{72}{18+16+9}=\frac{16}{43}$$

7. Four numbers are chosen at random from {1, 2, 3, …..,40}. The probability that they are not consecutive, is **[EAMCET 2007]**

1) $\frac{1}{2470}$ 2) $\frac{4}{7969}$ 3) $\frac{2469}{2470}$ 4) $\frac{7965}{7969}$

Ans:3

Sol: Probability that four of the numbers are consecutive $=\frac{{}^{37}C_1}{{}^{40}C_4}$

Now, probability that four of the numbers are not consecutive = $1-\frac{{}^{37}C_1}{{}^{40}C_4}=\frac{2469}{2470}$

8. If A and B are mutually exclusive event with $P(B)\neq 1$, then $P(A\,|\,\bar{B})$ is equal to (Here $\bar{B}$ is the complement of the event B). **[EAMCET 2007]**

1) $\frac{1}{P(B)}$ 2) $\frac{1}{1-P(B)}$ 3) $\frac{P(A)}{P(B)}$ 4) $\frac{P(A)}{1-P(B)}$

Ans:4

Sol: Given A and B are mutually exclusive events So, $(A\cap B)=\phi$

Now, $P(A\,|\,\bar{B})=\frac{P(A\cap\bar{B})}{P(B)}=\frac{P(A)-P(A\cap B)}{P(\bar{B})}=\frac{P(A)}{1-P(B)}$

9. A bag contains 6 white and 4 black balls. Two balls are drawn at random. The probability that they are of the same colour, is **[EAMCET 2007]**

1) $\frac{1}{15}$ 2) $\frac{2}{5}$ 3) $\frac{4}{15}$ 4) $\frac{7}{15}$

Ans:4

Sol: The number of ways to select 2 balls our of 10 $={}^{10}C_2$

Number of ways to select 2 balls both white $= {}^6C_2$

Number of ways to select 2 balls both black = $= {}^4C_2$

$\therefore$ The required probability $= \dfrac{{}^6C_2 + {}^4C_2}{{}^{10}C_2} = \dfrac{7}{15}$

10. If A and B are two independent events such that $P(B) = \dfrac{2}{7}, P(A \cup B^c) = 0.8$, then $P(A)$ is equal to **[EAMCET 2006]**

1) 0.1 2) 0.2 3) 0.3 4) 0.4

Ans: 3

Sol: $\because P(B) = \dfrac{2}{7}$ and $P(A \cup B^c) = 0.8$

$P(B^c) = 1 - \dfrac{2}{7} = \dfrac{5}{7}$

We know that $P(A \cup B^c) = P(A) + P(B^c) - P(A).P(B^c)$

$\Rightarrow 0.8 = P(A) + \dfrac{5}{7} - \dfrac{5}{7}P(A) \Rightarrow 0.8 = \dfrac{5}{7} + \dfrac{2}{7}P(A)$

$\Rightarrow 5.6 - = 2P(A) \Rightarrow P(A) = 0.3$

11. A number n is chosen at random from {1, 2, 3, 4,……,100}. The probability that 'n' is divided by 7, is **[EAMCET 2006]**

1) $\dfrac{71}{500}$ 2) $\dfrac{143}{1000}$ 3) $\dfrac{72}{500}$ 4) $\dfrac{71}{1000}$

Ans: 1

Sol: Multiple of 7 in {1, 2,……, 1000} are 7, 14, 21, …, 994.

Let the number of terms be N

$\therefore 994 = 7 + (N-1).7 \Rightarrow \dfrac{987}{7} = (N-1)$

$\Rightarrow N - 1 = 141 \Rightarrow N = 142$

$\therefore$ Number of terms which leaves remainder 1 when divided by 7 = 142 and n(S) = 1000

$\therefore$ Required probability = $\dfrac{n(E)}{n(S)} = \dfrac{142}{1000} = \dfrac{71}{500}$

12. In the random experiment of tossing two unbiased dice let E be the event of getting the sum 8 and F be the event of getting even numbers on both the dice. Then (I) $P(E) = \dfrac{7}{36}$ (II) $P(E) = \dfrac{1}{3}$. Which of the following is correct statement? **[EAMCET 2006]**

1) Both I and II are correct 2) Neither I nor II is true

3) I is true, II is false 4) I is false, II is true

Ans:2

Sol: E = Event of getting the sum 8 .

$= \{(2,6),(3,5),(4,4),(5,3),(6,2)\}$ and F = Event of getting the even numbers on both the dice.

$= \{(1,1),(2,2),(3,3),(4,4),(5,5),(6,6)\}$

$\therefore P(E) = 5$ and $P(F) = 6$

also $n(S) = 36 \therefore P(E) = \frac{n(E)}{n(S)} = \frac{5}{36}$ and $P(F) = \frac{n(F)}{n(S)} = \frac{6}{36} = \frac{1}{6}$

Neither I nor II is true.

13. Seven balls are drawn simultaneously from a bag containing 5 white and 6 green balls. The probability of drawing 3 white and 4 green balls is: **[EAMCET 2006]**

1) $\frac{7}{{}^{11}C_7}$ 2) $\frac{{}^5C_3 + {}^6C_4}{{}^{11}C_7}$ 3) $\frac{{}^5C_2 + {}^6C_2}{{}^{11}C_7}$ 4) $\frac{{}^6C_3 + {}^5C_4}{{}^{11}C_7}$

Ans:3

Sol: Number of ways to get 3 white and 4 green balls from 5 white and 6 green balls

$= {}^5C_3 \times {}^6C_4 = {}^5C_2 \times {}^6C_2$

and total number of ways = ${}^{11}C_7$

$\therefore$ Required probability = $\frac{n(E)}{n(S)} = \frac{{}^5C_2 + {}^6C_2}{{}^{11}C_7}$

14. A coin and six faced die, both unbiased, are thrown simultaneously. The probability o getting a head on the coin and an odd number on the die, is **[EAMCET 2005]**

1) $\frac{1}{2}$ 2) $\frac{3}{4}$ 3) $\frac{1}{4}$ 4) $\frac{2}{3}$

Ans:3

Sol: Let E = Event of getting a head from a coin. F = Event of getting an odd number (1, 3, 5) from a die. $P(E) = \frac{1}{2}, P(F) = \frac{3}{6} = \frac{1}{2}$

Since E and F are independent events

$\therefore P(E \cap F) = P(E) \cap P(F) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

15. A number n is chosen at random from S = {1, 2, 3, …., 50}. Let $A = \left\{n \in S : n + \frac{50}{n} > 27\right\}$,

$B = \{n \in S; n \text{ is a prime}\}$ and $C = \{n \in S; n \text{ is a square}\}$. Then correct order of their probabilities is **[EAMCET 2005]**

1) $P(A) < P(B) < P(C)$ 2) $P(A) > P(B) > P(C)$

3) $P(B) < P(A) < P(C)$ 4) $P(A) > P(C) > P(B)$

Ans: 2

Sol: Given that S = {1, 2, 3, …., 50}, $A = \left\{n \in S : n + \frac{50}{n} > 27\right\}$

$= \{n \in S : n < 2 \text{ or } n > 25\}$

$= \{1, 26, 27, ..., 50\}$

$\Rightarrow n(A) = 26$

$B = \{n \in S : n \text{ is a prime}\} = \{2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47\}$

$\Rightarrow n(B) = 15$

$C = \{n \in S; n \text{ is a square}\} = \{1, 4, 9, 16, 25, 36, 49\}$

$\Rightarrow n(C) = 7$

$\therefore\ P(A) = \frac{n(A)}{n(S)} = \frac{26}{50};\ P(B) = \frac{n(B)}{n(S)} = \frac{15}{50};\ P(C) = \frac{n(C)}{n(S)} = \frac{7}{50}$

$\Rightarrow P(A) > P(B) > P(C)$

16. Box A contain 2 black and 3 red balls, while Box B contains 3 black and 4 red balls. Out of these two boxes one is selected at random; and the probability of choosing Box A is double that of Box B. If a red ball is drawn from the selected box, then the probability that it has come from Box B, is **[EAMCET 2005]**

1) $\frac{21}{41}$ 2) $\frac{10}{31}$ 3) $\frac{12}{31}$ 4) $\frac{13}{41}$

Ans:2

Sol: Let P(B) = p according to given condition P(A) = 2P(B) = 2p

$P\left(\frac{R}{A}\right) = \frac{{}^3C_1}{{}^5C_1} = \frac{3}{5}$ and $P\left(\frac{R}{B}\right) = \frac{{}^4C_1}{{}^7C_1} = \frac{4}{7}$

Using Baye's theorem $P\left(\frac{B}{R}\right) = \frac{P(B).P\left(\frac{R}{B}\right)}{P(A).P\left(\frac{R}{A}\right) + P(B).P\left(\frac{R}{B}\right)}$

$$= \frac{p.\frac{4}{7}}{2p.\frac{3}{5} + p.\frac{4}{7}} = \frac{\frac{4}{7}}{\frac{6}{5} + \frac{4}{7}} = \frac{\frac{4}{7}}{\frac{42+20}{35}} = \frac{20}{62} = \frac{10}{31}$$

17. An unbiased coin tossed to get 2 points for turning up a head and one point for the tail. If three unbiased coins are tossed simultaneously, then the probability of getting a total off odd number of points is **[EAMCET 2004]**

1) $\frac{1}{2}$ 2) $\frac{1}{4}$ 3) $\frac{1}{8}$ 4) $\frac{3}{8}$

Ans:1

Sol: We are getting a odd number of point, if it will comes (two head, one tail and three tail).

$\therefore\ P(H) = P(T) = \frac{1}{2}$

$\therefore$ Required probability = Probability of getting two heads and one tail + Probability of all three tails

$$= {}^3C_2\left(\frac{1}{2}\right)^2\left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^3 \Rightarrow 3\left(\frac{1}{2}\right)^3 + \left(\frac{1}{2}\right)^3 = \frac{3}{8} + \frac{1}{8} = \frac{1}{2}$$

18. Suppose E and F are two events of a random experiment. If the probability of occurrence of E is 1/5 and the probability of occurrence of F given E is 1/10, then the probability of non- occurrence of at least one of the events E and F is **[EAMCET 2004]**

1) $\frac{1}{18}$ 2) $\frac{1}{2}$ 3) $\frac{49}{50}$ 4) $\frac{1}{50}$

Ans:3

Sol: Given that $P(E)=\frac{1}{5}, P(F)=\frac{1}{10}$

Probability of both occurrence, $P(E\cap F)=P(E)P(F)=\frac{1}{5}.\frac{1}{10}=\frac{1}{50}$

Required Probability = $1-P(E\cap F)=1-\frac{1}{50}=\frac{49}{50}$

19. Six faces of an unbiased die are numbered with 2, 3, 5, 7, 11 and 13. If two such dice are thrown, then the probability that the sum on the uppermost faces of the dice is an odd number is **[EAMCET 2004]**

1) $\frac{5}{18}$ 2) $\frac{5}{36}$ 3) $\frac{13}{18}$ 4) $\frac{25}{36}$

Ans:1

Sol: The sum of two numbered on a dice is odd only, whence once is odd and second is even.

$\therefore$ Required probability = 2 × Probability of odd number × Probability of even number

[$\because$ Here we multiply by 2 because either the even number is on first or second dice.]

$=2\times\left(\frac{5}{6}\right)\times\left(\frac{1}{6}\right)=\frac{5}{18}$

20. If $P(A\cup B)=0.8$ and $P(A\cap B)=0.3$, then $P(\bar{A})+P(\bar{B})$ is equal to **[EAMCET 2003]**

1) 0.3 2) 0.5 3) 0.8 4) 0.9

Ans: 4

Sol: We have $P(A)+P(B)=P(A\cup B)+P(A\cap B)$

$=0.8+0.3=1.1$

$\Rightarrow 1-P(\bar{A})+1-P(\bar{B})=1.1$

$\Rightarrow P(\bar{A})+P(\bar{B})=2-1.1=0.9$

21 A coin is tossed n times the probability of getting head at least once is greater than 0.8. Then the least value of such n is **[EAMCET 2003]**

1) 2 2) 3 3) 4 4) 5

Ans: 2

Sol: The probability of getting head = $\frac{1}{2}$

The probability of getting head at least once in n times

$$= \frac{1}{2} + \frac{1}{2^2} + ... + \frac{1}{2^n} = \frac{\frac{1}{2}\left(1 - \left(\frac{1}{2}\right)^n\right)}{1 - \frac{1}{2}} = 1 - \left(\frac{1}{2}\right)^n$$

Given that $1 - \left(\frac{1}{2}\right)^n > 0.8 \Rightarrow \left(\frac{1}{2}\right)^n < 0.2 \Rightarrow 2^n > \frac{1}{0.2} \Rightarrow 2^n > 5$

Least value of n for which $2^n > 5$ is n = 3

22. A bag X contains 2 white and 3 black balls and another bag Y contains 4 white and 2 black balls. One bag is selected at random and a ball is drawn from it. Then the probability for the ball chosen be white, is **[EAMCET 2003]**

1) $\frac{2}{15}$ 2) $\frac{7}{15}$ 3) $\frac{8}{15}$ 4) $\frac{14}{15}$

Ans:3

Sol: Probability of selecting a white ball from X bag = $\frac{2}{5}$

Probability of selecting a white ball from Y bag = $\frac{4}{6} = \frac{2}{3}$

Probability of selecting a white ball from X or Y bags $= \frac{2}{5} + \frac{2}{3} = \frac{6+10}{15} = \frac{16}{15}$

Probability of selecting the white ball from one of the bags = $= \frac{1}{2} . \frac{16}{15} = \frac{8}{15}$

23. A bag contains 5 black balls, 4 white balls and 3 red balls. If a ball is selected at random, the probability that it is a black or a red ball, is **[EAMCET 2002]**

1) $\frac{1}{3}$ 2) $\frac{1}{4}$ 3) $\frac{5}{12}$ 4) $\frac{2}{3}$

Ans: 4

Sol: Required probability

$$= \frac{{}^5C_1 + {}^3C_1}{{}^{12}C_1} = \frac{5+3}{12} = \frac{8}{12} = \frac{2}{3}$$

24. The probability of getting qualified in IITJEE and EAMCET by a student are respectively $\frac{1}{5}$ and $\frac{3}{5}$.

The probability that the student gets qualified for at least on of these test, is **[EAMCET 2002]**

1) $\frac{3}{25}$ 2) $\frac{8}{25}$ 3) $\frac{17}{25}$ 4) $\frac{22}{25}$

Ans: 3

Sol: Given that $P(A) = \frac{1}{5} . P(B) = \frac{3}{5}$

Required probability = $P(A)P(\bar{B}) + P(\bar{A})P(B) + P(A)P(B)$

$= \frac{1}{5}\left(1-\frac{3}{5}\right)+\left(1-\frac{1}{5}\right).\frac{3}{5}+\frac{1}{5}.\frac{3}{5}$

$= \frac{1}{5}.\frac{2}{5}+\frac{4}{5}.\frac{3}{5}+\frac{3}{25} \Rightarrow \frac{2}{25}+\frac{12}{25}+\frac{3}{25}=\frac{17}{25}$

25. One die and a coin (both unbiased) are tossed simultaneously. The probability of getting 5 on the top of the die and tail on the coin is **[EAMCET 2002]**

1) $\frac{1}{2}$ 2) $\frac{1}{12}$ 3) $\frac{1}{6}$ 4) $\frac{1}{8}$

Ans: 2

Sol: Required probability = $\frac{1}{6}\times\frac{1}{2}=\frac{1}{12}$

26. In a competition A, B, C are participating the probability that A wins is twice that of B, the probability that B wins is twice that of C, then probability that A loses is **[EAMCET 2001]**

1) $\frac{1}{2}$ 2) $\frac{2}{7}$ 3) $\frac{4}{7}$ 4) $\frac{3}{7}$

Ans: 4

Sol: Let P(C) = p, then P(B) = 2p, P(A) = 2(2p) = 4p

Given that $P(A)+P(B)+P(C)=1$

$\Rightarrow 4p+2p+p=1 \Rightarrow p=\frac{1}{7} \quad \therefore \; P(A)=\frac{4}{7}$

$P(\bar{A})=1-\frac{4}{7}=\frac{3}{7}$

Thus the required probability is $\frac{3}{7}$

27. The probability that a number selected at random from the set of numbers (1, 2, 3, …, 100) s a cube is **[EAMCET 2001]**

1) $\frac{1}{25}$ 2) $\frac{2}{25}$ 3) $\frac{3}{25}$ 4) $\frac{4}{25}$

Ans:1

Sol: n(S) = 100

The se of cube numbers $A=\left(1^3,2^3,3^3,4^3\right)$

Total number in favour n(A) = 4

Required probability $\frac{n(A)}{n(S)}=\frac{4}{100}=\frac{1}{25}$

28. The events A and B have probabilities 0.25 and 0.50 respectively. The probability that both A and B occur simultaneously is 0.14, then the probability that neither A nor B occurs, is **[EAMCET 2001]**

1) 0.39 2) 0.29 3) 0.110 4) 0.25

Ans: 1

Sol: Given that $P(A)=0.25, P(B)=0.50$, $P(A\cap B)=0.14$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$
$$= 0.25 + 0.50 - 0.14 \Rightarrow 0.75 - 0.14 = 0.61$$
$$P(\bar{A} \cap \bar{B}) = P(\overline{A \cup B}) = 1 - P(A \cup B) = 1 - 0.61 = 0.39$$

29. Two dice are rolled simultaneously. The probability that the sum of the two numbers on the mean is 3 and variance is 2 **[EAMCET 2001]**

1) $\frac{5}{12}$ 2) $\frac{7}{12}$ 3) $\frac{9}{14}$ 4) none of these

Ans:1

Sol: Give that A =[2, 3, 5, 7, 11]

Required probability $= P(X=2) + P(X=3) + P(X=5) + P(X=7) + P(X=11)$

$$\frac{1}{36} + \frac{2}{36} + \frac{4}{36} + \frac{6}{36} + \frac{2}{36} = \frac{15}{36} = \frac{5}{12}$$

30. Probability of choosing a number divisible by 6 or 8 from among 1 to 90 is **[EAMCET 2000]**

1) $\frac{1}{6}$ 2) $\frac{11}{90}$ 3) $\frac{1}{30}$ 4) $\frac{23}{90}$

Ans: 4

Sol: The total number of ways = 90

Number divisible by 6 , $E = (6,12,18,24,30,36,42,48,54,60,66,72,78,84,90)$

$\therefore\ n(E) = 15$

Numbers divisible by 8, F = $\{8,16,24,32,40,48,56,64,72,80,88\}$

$\therefore\ n(F) = 11$

The number divisible by both 6 and 8 $E \cap F = \{24,48,72\}$

$n(E \cap F) = 3$

The total number of way, $= 15 + 11 - 3 = 26 - 3 = 23$

Required probability = $= \frac{23}{90}$

31. The probability of two events A and Bare 0.25 and 0.40 respectively and $P(A \cap B) = 0.15$ the probabilities that neither A nor B occurs is **[EAMCET 2000]**

1) 0.35 2) 0.65 3) 0.5 4) 0.75

Ans: 3

Sol: Given that

$P(A) = 0.25, P(B) = 0.40$

$P(A \cap B) = 0.15$

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$= 0.25 + 0.40 - 0.15 = 0.50 \Rightarrow 1 - 0.5 = 0.5$