PRACTICE QUESTIONS INTRODUCTION TO PROBABILITY

EXERCISE – 2.1

SAMPLE SPACES AND EVENTS

1. A Coin is tossed twice. Let A denote the event that at least one head appears, and B denote the event that at most two tails appear then find the following

(a) Sample Space and Events A, B
(b) A^c *and* B^c
(c) $A \cup B,\ A \cap B,\ A - B$

2. A Coin is tossed thrice. Let A denote the event that at least two heads appear, and B denote the event that at most one tail appears then find the following

(a) Sample Space and Events A, B
(b) A^c *and* B^c
(c) $A \cup B,\ A \cap B,\ A - B$

3. A die is rolled once. Let A be the event that dots appeared is an even number, and B the event that dots appeared is a prime number, then find the following

(a) Sample Space and Events A, B
(b) A^c *and* B^c
(c) $A \cup B,\ A \cap B,\ A - B$

4. Two dice are rolled once. Let A be the event that the sum of dots on the faces shown is an odd number, and B the event that there is at least one 3 shown. then find the following

(a) Sample Space and Events A, B
(b) A^c *and* B^c
(c) $A \cup B,\ A \cap B,\ A - B$

5. A Coin and a Die are rolled together. Let A denote the event that head appears on the coin and B denote the event that number of dots appeared on the die is at most 4, then find the following

(a) Sample Space and Events A, B
(b) A^c *and* B^c
(c) $A \cup B,\ A \cap B,\ A - B$

EXERCISE – 2.2

BASIC PROBABILITY

1. A box of highlighters contains 10 red, 15 blue, 5 green and 10 yellow highlighters. A highlighter is picked at random from the box. Find the probability that
   (a) it is red
   (b) it is green
   (c) it is not yellow
   (d) it is purple
   (e) it is neither green nor yellow

$(Ans: \frac{1}{4}, \frac{1}{8}, \frac{3}{4}, 0, \frac{5}{8})$

2. If $S = \{1,2,3,.....,30\}$, a number is selected from set S at random what is the probability that selected number is
   (a) An even number
   (b) A prime number
   (c) A multiple of 3
   (d) Factor of 48
   (e) An odd number greater than 5 but less than 15.

$(Ans: \frac{1}{2}, \frac{1}{3}, \frac{1}{3}, \frac{3}{10}, \frac{2}{15})$

3. A card is drawn from an ordinary deck of 52 playing cards, find the probability that
   (a) it is a red card
   (b) it is a diamond card
   (c) it is an ace
   (d) it is a picture card
   (e) it is not a heart card.

$(Ans: \frac{1}{2}, \frac{1}{4}, \frac{1}{13}, \frac{3}{13}, \frac{3}{4})$

4. A fair coin is tossed once. Find the probability that
   (a) exactly one head is obtained
   (b) exactly one tail is obtained
   (c) at least one head is obtained
   (d) at most one head is obtained
   (e) at most one tail is obtained

$(Ans: 0.5, 0.5, 0.5, 1, 1)$

5. A fair coin is tossed twice. Find the probability that
   (a) exactly one head is obtained
   (b) at least one head is obtained
   (c) at most one head is obtained
   (d) at least two heads are obtained
   (e) at most two tails are obtained

$(Ans: \frac{1}{2}, \frac{3}{4}, \frac{3}{4}, \frac{1}{4}, 1)$

6. A fair coin is tossed three times. Find the probability that
- (a) tail appears
- (b) exactly one tail appears
- (c) at least two tails appear
- (d) at most two tails appear
- (e) at most three tails appear

$(Ans: \frac{7}{8}, \frac{3}{8}, \frac{1}{2}, \frac{7}{8}, 1)$

7. An ordinary die is thrown once. Find the probability that number obtained is
- (a) a multiple of 3
- (b) less than 5
- (c) a factor of 6
- (d) a prime number
- (e) an odd number

$(Ans: \frac{1}{2}, \frac{2}{3}, \frac{2}{3}, \frac{1}{2}, \frac{1}{2})$

8. Two ordinary unbiased dice are thrown. Find the probability that
- (a) sum of the numbers on the two dice is 6
- (b) sum of the numbers on the two dice exceeds 7
- (c) sum of the numbers on the two dice is less than 8
- (d) sum of the numbers on the two dice is at least 10
- (e) sum of the numbers on the two dice is at most 8

$(Ans: \frac{5}{36}, \frac{5}{12}, \frac{7}{12}, \frac{1}{6}, \frac{13}{18})$

9. Two ordinary unbiased dice are thrown. Find the probability that
- (a) two dice show the same number
- (b) product of dots is a multiple of 3
- (c) product of dots is a factor of 20
- (d) difference of dots is a multiple of 4
- (e) difference of dots is an odd number

$(Ans: \frac{1}{6}, \frac{5}{9}, \frac{1}{3}, \frac{1}{12}, \frac{1}{2})$

10. Three dice are thrown once. Find the probability that
- (a) Sum of dots appeared is greater than 19.
- (b) Sum of dots appeared is less than 4.
- (c) Same dots appeared on three dice

$(Ans: 0, \frac{1}{216}, \frac{6}{216})$