

# IX MOE – O – Probability (sol)

## OBJECTIVE EXERCISES

### RANDOM EXPERIMENTS - I

**1. Probability is \_\_\_\_\_**

- a) Number of outcomes in favour of event
- b) Total number of possible outcomes
- c) Ratio of number of outcomes in favour to total number of outcomes
- d) Ratio of total number of outcomes to number of outcomes in favour

**Answer: c**

Explanation: Probability is chance of an outcome to appear. It is the ratio of number of outcomes in favour to total number of outcomes.

**2. Probability of getting head on an unbiased coin is \_\_\_\_\_**

- a)  $\frac{1}{4}$
- b) 1
- c) 0
- d)  $\frac{1}{2}$

**Answer: d**

Explanation: An unbiased coin can have head or tail as outcome i.e. there are two possible outcomes.

So, probability of getting head on an unbiased coin is  $\frac{1}{2}$ .

**3. Probability of getting tail on an unbiased coin is \_\_\_\_\_**

- a)  $\frac{1}{4}$
- b) 1
- c) 0
- d)  $\frac{1}{2}$

**Answer: d**

Explanation: An unbiased coin can have head or tail as outcome i.e. there are two possible outcomes.

So, probability of getting tail on an unbiased coin is  $\frac{1}{2}$ .

**4. Probability of getting an even number on dice is \_\_\_\_\_**

- a) 1
- b)  $\frac{1}{2}$
- c)  $\frac{1}{3}$
- d) 0

**Answer: b**

Explanation: There are six possible outcomes on dice i.e. 1 to 6.

Even numbers on dice are 2,4,6 i.e. three outcomes in favour of the event.

So, probability of getting an even number on dice is  $3/6 = \frac{1}{2}$ .

**5. Probability of getting an odd number on dice is \_\_\_\_\_**

- a) 1
- b)  $\frac{1}{2}$
- c)  $\frac{1}{3}$
- d) 0

**Answer: b**

Explanation: There are six possible outcomes on dice i.e. 1 to 6.

Odd numbers on dice are 1,2,3 i.e. three outcomes in favour of the event.

So, probability of getting an odd number on dice is  $3/6 = \frac{1}{2}$ .

**6. Probability of getting prime number on dice is \_\_\_\_\_**

- a)  $\frac{1}{2}$
- b)  $\frac{1}{4}$
- c)  $\frac{1}{3}$
- d) 1

**Answer: a**

Explanation: There are six possible outcomes on dice i.e. 1 to 6.

Prime numbers on dice are 2,3,5 i.e. three outcomes in favour of the event.

So, probability of getting a prime number on dice is  $3/6 = \frac{1}{2}$ .

**7. Probability of getting composite number on dice is \_\_\_\_\_**

- a)  $\frac{1}{2}$
- b)  $\frac{1}{4}$
- c)  $\frac{1}{3}$
- d) 1

**Answer: c**

Explanation: There are six possible outcomes on dice i.e. 1 to 6.

Composite numbers on dice are 4,6 i.e. two outcomes in favour of the event.

So, probability of getting a composite number on dice is  $2/6 = \frac{1}{3}$ .

**8. Probability of getting 7 on a dice is \_\_\_\_\_**

- a)  $\frac{1}{2}$
- b) 0
- c) 1
- d)  $\frac{1}{3}$

**Answer: b**

Explanation: There are six possible outcomes on dice i.e. 1 to 6.

7 does not appear on a dice so probability of getting 7 on a dice is zero.

### 9. If two coins are tossed simultaneously what are total number of possible outcomes?

- a) 2      b) 4
- c) 6      d) 8

**Answer: b**

Explanation: If two coins are tossed simultaneously total number of possible outcomes are 4.  
 $\{HH, TT, HT, TH\}$

### 10. If two coins are tossed simultaneously what is the probability of getting exactly one head?

- a)  $\frac{1}{2}$       b)  $\frac{1}{3}$
- c)  $\frac{1}{4}$       d)  $\frac{3}{4}$

**Answer: a**

Explanation: If two coins are tossed simultaneously total number of possible outcomes are 4.  
 $\{HH, TT, HT, TH\}$  out of which  $\{HT, TH\}$  favour the event.  
So, probability of getting exactly one head =  $2/4 = 1/2$ .

### 11. If two coins are tossed simultaneously what is the probability of getting exactly one tail?

- a)  $\frac{1}{2}$       b)  $\frac{1}{3}$
- c)  $\frac{1}{4}$       d)  $\frac{3}{4}$

**Answer: a**

Explanation: If two coins are tossed simultaneously total number of possible outcomes are 4.  
 $\{HH, TT, HT, TH\}$  out of which  $\{HT, TH\}$  favour the event.  
So, probability of getting exactly one tail =  $2/4 = 1/2$ .

### 12. If two coins are tossed simultaneously what is the probability of getting at least one head?

- a)  $\frac{1}{2}$       b)  $\frac{1}{3}$
- c)  $\frac{1}{4}$       d)  $\frac{3}{4}$

**Answer: d**

Explanation: If two coins are tossed simultaneously total number of possible

outcomes are 4.

$\{HH, TT, HT, TH\}$  out of which  $\{HH, HT, TH\}$  favour the event.

So, probability of getting at least one head =  $3/4$ .

### 13. If two coins are tossed simultaneously what is the probability of getting at most one head?

- a)  $\frac{1}{2}$       b)  $\frac{1}{3}$
- c)  $\frac{1}{4}$       d)  $\frac{3}{4}$

**Answer: d**

Explanation: If two coins are tossed simultaneously total number of possible outcomes are 4.

$\{HH, TT, HT, TH\}$  out of which  $\{HT, TH, TT\}$  favour the event.

So, probability of getting at most one head =  $3/4$ .

### 14. If two coins are tossed simultaneously what is the probability of getting all heads?

- a)  $\frac{1}{2}$       b)  $\frac{1}{3}$
- c)  $\frac{1}{4}$       d)  $\frac{3}{4}$

**Answer: c**

Explanation: If two coins are tossed simultaneously total number of possible outcomes are 4.

$\{HH, TT, HT, TH\}$  out of which  $\{HH\}$  favour the event.

So, probability of getting all heads =  $1/4$ .

### 15. If two coins are tossed simultaneously what is the probability of getting no heads?

- a)  $\frac{1}{2}$       b)  $\frac{1}{3}$
- c)  $\frac{1}{4}$       d)  $\frac{3}{4}$

**Answer: c**

Explanation: If two coins are tossed simultaneously total number of possible outcomes are 4.

$\{HH, TT, HT, TH\}$  out of which  $\{TT\}$  favour the event.

So, probability of getting no heads =  $1/4$ .

**1. If n coins are tossed simultaneously what is the total number of outcomes?**

- a)  $2^{n-2}$       b)  $2^{n-1}$   
 c)  $2^n$       d)  $2^{n+1}$

**Answer: c**

Explanation: If n coins are tossed simultaneously total number of possible outcomes are  $2^n$ .

For 2 coins, it is 4. For 3 coins it is 8 etc.

**2. If four dice are rolled simultaneously then what is the total number of possible outcomes?**

- a) 6      b) 36  
 c) 216      d) 1296

**Answer: d**

Explanation: If four dice are rolled simultaneously then total number of possible outcomes is  $6^4 = 1296$ .

**3. If two dice are simultaneously rolled then what is probability of getting sum 4?**

- a)  $1/6$       b)  $1/4$   
 c)  $1/12$       d)  $1/9$

**Answer: c**

Explanation: If two dice are simultaneously rolled then total number of possible outcomes is  $6 \times 6 = 36$ .

We can get 4 as sum in these cases  $\{(1,3), (2,2), (3,1)\}$ . So, probability of getting sum 4 is  $3/36 = 1/12$ .

**4. If two dice are simultaneously rolled then what is probability of getting sum 11?**

- a)  $1/6$       b)  $1/4$   
 c)  $1/9$       d)  $1/18$

**Answer: d**

Explanation: If two dice are simultaneously rolled then total number of possible outcomes is  $6 \times 6 = 36$ .

We can get 11 as sum in these cases  $\{(5,6), (6,5)\}$ . So, probability of getting sum 11 is  $2/36 = 1/18$ .

**5. A coin is tossed and a dice is rolled simultaneously what is total number of possible outcomes?**

- a) 2      b) 6

- c) 12      d) 24

**Answer: c**

Explanation: If a coin is tossed and a dice is rolled simultaneously then total number of possible outcomes will be  $2 \times 6 = 12$ .

**6. A coin is tossed and if head come then a red dice is rolled and if tail come then a blue dice is rolled then what is the possible number of outcomes?**

- a) 6      b) 12  
 c) 24      d) 72

**Answer: b**

Explanation: If head come on coin then red dice can have 6 outcomes so total  $1 \times 6 = 6$  outcomes. And if tail come on coin then blue dice can have 6 outcomes so total  $1 \times 6 = 6$  outcomes.

So, total number of possible outcomes =  $6 + 6 = 12$ .

**7. If 4 bulbs are there each of which can be defective or non-defective then what is the total number of possible outcomes?**

- a) 8      b) 16      c) 4      d) 2

**Answer: b**

Explanation: Each bulb can have two cases i.e. either defective or non-defective. Then total number of outcomes will be  $2^4 = 16$ .

**8. If 4 bulbs are there each of which can be defective or non-defective then what is the probability that all the bulbs are defective?**

- a)  $1/8$       b)  $1/16$   
 c)  $1/4$       d)  $1/2$

**Answer: b**

Explanation: Each bulb can have two cases i.e. either defective or non-defective. Then total number of outcomes will be  $2^4 = 16$ .

So, the probability that all the bulbs are defective is  $1/16$ .

**9. If 4 bulbs are there each of which can be defective or non-defective then what is the probability that at least one bulb is non-defective?**

- a)  $7/8$       b)  $15/16$   
 c)  $3/4$       d)  $1/2$

**Answer: b**

Explanation: Each bulb can have two cases i.e. either defective or non-defective. Then total number of outcomes will be  $2^4 = 16$ . Probability that all the bulbs are defective is  $1/16$ . So, the probability that at least one bulb is non-defective is  $1 - 1/16 = 15/16$ .

**10. The probability can be negative.**

- a) True      b) False

**Answer: b**

Explanation: Since probability is the ratio of number of outcomes in favour to total number of possible outcomes and number (counting) cannot be negative so, probability cannot be negative.

**EVENTS – I****1. Set which contains all possible outcomes is \_\_\_\_\_**

- a) event      b) empty set  
c) sample space      d) probability

**Answer: c**

Explanation: Set which contains all possible outcomes is called sample space. It can also be called universal set.

favour.

So, it is denoted by sample space S.

**2. Any subset of sample space is known as \_\_\_\_\_**

- a) event      b) empty set  
c) sample space      d) probability

**Answer: a**

Explanation: Any subset of sample space is known as event. Event means occurrence of some particular outcomes.

**6. What is the probability of a sure event?**

- a) 0      b) 1  
c)  $\frac{1}{2}$       d)  $\frac{1}{4}$

**Answer: b**

Explanation: Sure event has all outcomes in favour i.e. number of outcomes in favour equal to the total number of possible outcomes.

And probability is ratio of number of outcomes in favour to the total number of possible outcomes.

So, probability of sure event will be 1.

**3. Which symbol denote impossible event?**

- a) S      b)  $\Phi$       c)  $\beta$       d)  $\mu$

**Answer: b**

Explanation: Impossible event has no outcome in favour. So, it is denoted by empty set  $\Phi$ .

**7. Which of the following cannot be the value of probability?**

- a) 1      b) -1      c) 0      d)  $\frac{1}{2}$

**Answer: b**

Explanation: Since probability is ratio of number of outcomes in favour to the total number of possible outcomes. So, it cannot be negative.

**4. What is the probability of impossible event?**

- a) 0      b) 1  
c)  $\frac{1}{2}$       d)  $\frac{1}{4}$

**Answer: a**

Explanation: Impossible event has no outcome in favour. And probability is ratio of number of outcomes in favour to the total number of possible outcomes. So, probability of impossible event is zero.

**8. Which of the following cannot be the value of probability?**

- a) 1      b)  $\frac{1}{4}$       c) 0      d) 2

**Answer: d**

Explanation: Since probability is ratio of number of outcomes in favour to the total number of possible outcomes. And number of outcomes in favour are always less than or equal to total number of possible outcomes. So, probability is always less than or equal to 1.

**5. Which symbol denotes sure event?**

- a) S      b)  $\Phi$       c)  $\beta$       d)  $\mu$

**Answer: a**

Explanation: Sure event has all outcomes in

**9. What is the probability of getting a number greater than 6 on dice?**

- a) 0      b) 1/2  
c) 1/3      d) 1

**Answer: a**

Explanation: Since number greater than 6 cannot appear on dice so probability of getting a number greater than 6 is zero.

**10. If an event has only one sample point then it is called \_\_\_\_\_**

- a) simple event  
b) compound event  
c) impossible event  
d) sure event

**Answer: a**

Explanation: If an event has only one sample point then it is called simple event.  
e.g. All heads on tossing n coins.

**11. If an event has more than one sample point then it is called \_\_\_\_\_**

- a) simple event  
b) compound event  
c) impossible event  
d) sure event

**Answer: b**

Explanation: If an event has more than one sample point then it is called compound event.  
e.g. at least one head appears on tossing n coins.

**12. If two coins are tossed simultaneously then "Exactly one head appears" is simple event or not.**

- a) True      b) False

**Answer: b**

Explanation: If two coins are tossed

simultaneously then  $S = \{\text{HH, HT, TH, TT}\}$ .  
"Exactly one head appears" includes HT, TH. It has more than one sample point so it is compound event not simple event.

**13. For every event there exist some complementary event.**

- a) True      b) False

**Answer: a**

Explanation: Yes, for every event there exist some complementary event. If the event is A then complementary event is not A.

**14. What is a complementary event for "At least one head appears" if two coins are tossed simultaneously?**

- a) Exactly one head appears  
b) At least one tail appears  
c) At most one tail appears  
d) None head appears

**Answer: d**

Explanation: We know complementary of at least one is none. So, complementary event for "At least one head appears" is none head appears.

**15. What is the representation of complementary event of event A?**

- a)  $S-A$       b)  $A-S$   
c)  $S$       d)  $S+A$

**Answer: a**

Explanation: If the event is A then complementary event is not A.

Not A means  $S-A$ . So, complementary event of event A is represented by  $A' = S-A$ .

## EVENTS – II

**1. Event \_\_\_\_\_ contains elements which are either in A or in B or in both.**

- a) A or B      b) A and B  
c) A but not B      d) B but not A

**Answer: a**

Explanation: Event "A or B" contains elements which are either in A or in B or in both. It is also called union of the two sets.

**2. Event "A or B" is represented by \_\_\_\_\_**

- a)  $A \cup B$       b)  $A \cap B$   
c)  $A \cap B'$  d)  $A' \cap B$

**Answer: a**

Explanation: Event "A or B" contains elements which are either in A or in B or in both. It is also called union of the two sets and is represented by  $A \cup B$ .

**3. Event "A and B" is represented by \_\_\_\_\_**

- a)  $A \cup B$       b)  $A \cap B$

c)  $A \cap B'$  d)  $A' \cap B$

**Answer: b**

Explanation: Event "A and B" contains elements which are both in A and B. It is also called intersection of two sets and is represented by  $A \cap B$ .

**4. Event \_\_\_\_\_ contains elements which are present in both A as well as B.**

- a) A or B                      b) A and B
- c) A but not B                d) B but not A

**Answer: b**

Explanation: Event "A and B" contains elements which are in A as well as B. It is also called intersection of the two sets.

**5. Event \_\_\_\_\_ contains elements which are present in A and absent in B.**

- a) A or B                      b) A and B
- c) A but not B                d) B but not A

**Answer: c**

Explanation: Event "A but not B" contains elements which are present in A but not in B. It is represented by  $A - B$  or  $A \cap B'$ .

**6. Event \_\_\_\_\_ contains elements which are present in B and absent in A.**

- a) A or B                      b) A and B
- c) A but not B                d) B but not A

**Answer: d**

Explanation: Event "B but not A" contains elements which are present in B but not in A. It is represented by  $B - A$  or  $B \cap A'$ .

**7. Event "A but not B" is represented by**

- a)  $A \cup B$                       b)  $A \cap B$
- c)  $A \cap B'$  d)  $A' \cap B$

**Answer: c**

Explanation: Event "A but not B" contains elements which are present in A but not in B. It is represented by  $A - B$  or  $A \cap B'$ .

**8. Event "B but not A" is represented by**

- a)  $A \cup B$                       b)  $A \cap B$
- c)  $A \cap B'$  d)  $A' \cap B$

**Answer: d**

Explanation: Event "B but not A" contains

elements which are present in B but not in A. It is represented by  $B - A$  or  $B \cap A'$ .

**9. If  $A \cap B = \emptyset$  then set is said to be mutually exhaustive.**

- a) True                        b) False

**Answer: b**

Explanation: If  $A \cap B = \emptyset$  then set is said to be mutually exclusive not mutually exhaustive. If both sets A and B have no element in common then it is a pair of mutually exclusive sets.

**10. If  $A \cup B = S$  then set is said to be mutually exhaustive.**

- a) True                        b) False

**Answer: b**

Explanation: If  $A \cup B = S$  then set is said to be mutually exhaustive. If both sets A and B have together form sample space then it is a pair of mutually exhaustive sets.

**11. Two dice are thrown simultaneously.**

**Let A be the event of getting sum less than 4 and B be the event of getting sum not more than 4. Find set "A or B".**

- a)  $\{(1,1), (1,2), (2,1)\}$
- b)  $\{\}$
- c)  $\{(1,1), (1,2), (1,3), (2,1), (2,2), (3,1)\}$
- d)  $\{(1,3), (2,2), (3,1)\}$

**Answer: c**

Explanation:  $A = \{(1,1), (1,2), (2,1)\}$

$B = \{(1,1), (1,2), (1,3), (2,1), (2,2), (3,1)\}$

"A or B" contains elements of either A or B or both.

So,  $A \text{ or } B = \{(1,1), (1,2), (1,3), (2,1), (2,2), (3,1)\}$ .

**12. Two dice are thrown simultaneously.**

**Let A be the event of getting sum less than 4 and B be the event of getting sum not more than 4. Find set "A and B".**

- a)  $\{(1,1), (1,2), (2,1)\}$
- b)  $\{\}$
- c)  $\{(1,1), (1,2), (1,3), (2,1), (2,2), (3,1)\}$
- d)  $\{(1,3), (2,2), (3,1)\}$

**Answer: a**

Explanation:  $A = \{(1,1), (1,2), (2,1)\}$

$B = \{(1,1), (1,2), (1,3), (2,1), (2,2), (3,1)\}$

"A and B" contains elements present in both A and B.

So,  $A \text{ and } B = \{(1,1), (1,2), (2,1)\}$ .

**13. Two dice are thrown simultaneously.  
Let A be the event of getting sum less than  
4 and B be the event of getting sum not  
more than 4. Find set "A and not B".**

- a)  $\{(1,1), (1,2), (2,1)\}$
- b)  $\{\}$
- c)  $\{(1,1), (1,2), (1,3), (2,1), (2,2), (3,1)\}$
- d)  $\{(1,3), (2,2), (3,1)\}$

**Answer: b**

Explanation:  $A = \{(1,1), (1,2), (2,1)\}$

$B = \{(1,1), (1,2), (1,3), (2,1), (2,2), (3,1)\}$

"A and not B" contains elements which are in A  
but not in B.

So,  $A$  and not  $B = \{\}$ .

**14. Two dice are thrown simultaneously.  
Let A be the event of getting sum less than  
4 and B be the event of getting sum not  
more than 4. Find set "B and not A".**

- a)  $\{(1,1), (1,2), (2,1)\}$
- b)  $\{\}$
- c)  $\{(1,1), (1,2), (1,3), (2,1), (2,2), (3,1)\}$
- d)  $\{(1,3), (2,2), (3,1)\}$

**Answer: d**

Explanation:  $A = \{(1,1), (1,2), (2,1)\}$

$B = \{(1,1), (1,2), (1,3), (2,1), (2,2), (3,1)\}$

"B and not A" contains elements which are in B  
but not in A.

So,  $B$  and not  $A = \{(1,3), (2,2), (3,1)\}$ .