

## Introduction to probability

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### MULTIPLE CHOICE

1. Each individual outcome of an experiment is called
- the sample space
  - a sample point
  - an experiment
  - an individual

ANS: B                      PTS: 1                      TOP: Probability Concepts

2. A graphical method of representing the sample points of an experiment is
- a frequency polygon
  - a histogram
  - an ogive
  - a tree diagram

ANS: D                      PTS: 1                      TOP: Probability Concepts

3. Any process that generates well-defined outcomes is
- an event
  - an experiment
  - a sample point
  - a sample space

ANS: B                      PTS: 1                      TOP: Probability Concepts

4. In statistical experiments, each time the experiment is repeated
- the same outcome must occur
  - the same outcome can not occur again
  - a different outcome may occur
  - a different out come must occur

ANS: C                      PTS: 1                      TOP: Probability Concepts

5. The counting rule that is used for counting the number of experimental outcomes when  $n$  objects are selected from a set of  $N$  objects where *order of selection* is **not** important is called
- permutation
  - combination
  - multiple step experiment
  - None of these alternatives is correct.

ANS: B                      PTS: 1                      TOP: Probability Concepts

6. From a group of six people, two individuals are to be selected at random. How many possible selections are there?
- 12
  - 36
  - 15
  - 8

ANS: C                      PTS: 1                      TOP: Probability Concepts

7. A method of assigning probabilities based upon judgment is referred to as the
- a. relative method
  - b. probability method
  - c. classical method
  - d. subjective method

ANS: D

PTS: 1

TOP: Probability Concepts

8. A graphical device used for enumerating sample points in a multiple-step experiment is a
- a. bar chart
  - b. pie chart
  - c. histogram
  - d. None of these alternatives is correct.

ANS: D

PTS: 1

TOP: Probability Concepts

9. The set of all possible outcomes of an experiment is
- a. an experiment
  - b. an event
  - c. the population
  - d. the sample space

ANS: D

PTS: 1

TOP: Probability Concepts

10. If a dime is tossed four times and comes up tails all four times, the probability of heads on the fifth trial is
- a. smaller than the probability of tails
  - b. larger than the probability of tails
  - c.  $\frac{1}{2}$
  - d.  $\frac{1}{32}$

ANS: C

PTS: 1

TOP: Probability Concepts

11. Of five letters (A, B, C, D, and E), two letters are to be selected at random. How many possible selections are there?
- a. 20
  - b. 7
  - c. 5!
  - d. 10

ANS: D

PTS: 1

TOP: Probability Concepts

12. Assume your favorite football team has 2 games left to finish the season. The outcome of each game can be win, lose or tie. The number of possible outcomes is
- a. 2
  - b. 4
  - c. 6
  - d. 9

ANS: D

PTS: 1

TOP: Probability Concepts

13. An experiment consists of tossing 4 coins successively. The number of sample points in this experiment is
- a. 16
  - b. 8
  - c. 4
  - d. 2

ANS: A

PTS: 1

TOP: Probability Concepts

14. Since the sun **must** rise tomorrow, then the probability of the sun rising tomorrow is
- a. much larger than one
  - b. zero
  - c. infinity
  - d. None of these alternatives is correct.

ANS: D

PTS: 1

TOP: Probability Concepts

15. If a coin is tossed three times, the likelihood of obtaining three heads in a row is
- a. zero
  - b. 0.500
  - c. 0.875
  - d. 0.125

ANS: D

PTS: 1

TOP: Probability Concepts

16. Of the last 100 customers entering a computer shop, 25 have purchased a computer. If the classical method for computing probability is used, the probability that the next customer will purchase a computer is
- a. 0.25
  - b. 0.50
  - c. 1.00
  - d. 0.75

ANS: B

PTS: 1

TOP: Probability Concepts

17. A six-sided die is tossed 3 times. The probability of observing three ones in a row is
- a.  $1/3$
  - b.  $1/6$
  - c.  $1/27$
  - d.  $1/216$

ANS: D

PTS: 1

TOP: Probability Concepts

18. A perfectly balanced coin is tossed 6 times and tails appears on all six tosses. Then, on the seventh trial
- a. tails can not appear
  - b. heads has a larger chance of appearing than tails
  - c. tails has a better chance of appearing than heads
  - d. None of these alternatives is correct.

ANS: D

PTS: 1

TOP: Probability Concepts

19. A method of assigning probabilities which assumes that the experimental outcomes are equally likely is referred to as the
- objective method
  - classical method
  - subjective method
  - experimental method

ANS: B

PTS: 1

TOP: Probability Concepts

20. The probability assigned to each experimental outcome must be
- any value larger than zero
  - smaller than zero
  - at least one
  - between zero and one

ANS: D

PTS: 1

TOP: Probability Concepts

21. Some of the CDs produced by a manufacturer are defective. From the production line, 5 CDs are selected and inspected. How many sample points exist in this experiment?
- 10
  - 25
  - 30
  - 32

ANS: D

PTS: 1

TOP: Probability Concepts

22. Assume your favorite football team has 3 games left to finish the season. The outcome of each game can be win, lose, or tie. How many possible outcomes exist?
- 7
  - 27
  - 36
  - 64

ANS: B

PTS: 1

TOP: Probability Concepts

23. From nine cards numbered 1 through 9, two cards are drawn. Consider the selection and classification of the cards as odd or even as an experiment. How many sample points are there for this experiment?
- 2
  - 3
  - 4
  - 9

ANS: C

PTS: 1

TOP: Probability Concepts

24. If a six sided die is tossed two times, the probability of obtaining two "4s" in a row is
- $\frac{1}{6}$
  - $\frac{1}{36}$
  - $\frac{1}{96}$
  - $\frac{1}{216}$

ANS: B

PTS: 1

TOP: Probability Concepts

25. The intersection of two mutually exclusive events

- a. can be any value between 0 to 1
- b. must always be equal to 1
- c. must always be equal to 0
- d. can be any positive value

ANS: C

PTS: 1

TOP: Probability Concepts

26. The range of probability is

- a. any value larger than zero
- b. any value between minus infinity to plus infinity
- c. zero to one
- d. any value between -1 to 1

ANS: C

PTS: 1

TOP: Probability Concepts

27. Two events, A and B, are mutually exclusive and each have a nonzero probability. If event A is known to occur, the probability of the occurrence of event B is

- a. one
- b. any positive value
- c. zero
- d. any value between 0 to 1

ANS: C

PTS: 1

TOP: Probability Concepts

28. The sum of the probabilities of two complementary events is

- a. Zero
- b. 0.5
- c. 0.57
- d. 1.0

ANS: D

PTS: 1

TOP: Probability Concepts

29. One of the basic requirements of probability is

- a. for each experimental outcome  $E_i$ , we must have  $P(E_i) \geq 1$
- b.  $P(A) = P(A^c) - 1$
- c. if there are k experimental outcomes, then  $\sum P(E_i) = 1$
- d.  $\sum P(E_i) \geq 1$

ANS: C

PTS: 1

TOP: Probability Concepts

30. The symbol  $\cup$  shows the

- a. union of events
- b. intersection of two events
- c. sum of the probabilities of events
- d. sample space

ANS: A

PTS: 1

TOP: Probability Concepts

31. The union of events A and B is the event containing
- all the sample points belonging to B or A
  - all the sample points belonging to A or B
  - all the sample points belonging to A or B or both
  - all the sample points belonging to A or B, but not both

ANS: C

PTS: 1

TOP: Probability Concepts

32. If A and B are mutually exclusive events with  $P(A) = 0.3$  and  $P(B) = 0.5$ , then  $P(A \cap B) =$
- 0.30
  - 0.15
  - 0.00
  - 0.20

ANS: C

PTS: 1

TOP: Probability Concepts

33. Events A and B are mutually exclusive with  $P(A) = 0.3$  and  $P(B) = 0.2$ . Then,  $P(B^c) =$
- 0.00
  - 0.06
  - 0.7
  - 0.8

ANS: D

PTS: 1

TOP: Probability Concepts

34. In an experiment, events A and B are mutually exclusive. If  $P(A) = 0.6$ , then the probability of B
- cannot be larger than 0.4
  - can be any value greater than 0.6
  - can be any value between 0 to 1
  - cannot be determined with the information given

ANS: A

PTS: 1

TOP: Probability Concepts

35. If  $P(A) = 0.62$ ,  $P(B) = 0.47$ , and  $P(A \cup B) = 0.88$ , then  $P(A \cap B) =$
- 0.2914
  - 1.9700
  - 0.6700
  - 0.2100

ANS: D

PTS: 1

TOP: Probability Concepts

36. If  $P(A) = 0.7$ ,  $P(B) = 0.6$ ,  $P(A \cap B) = 0$ , then events A and B are
- not mutually exclusive
  - mutually exclusive
  - independent events
  - complements of each other

ANS: B

PTS: 1

TOP: Probability Concepts

37. Two events with nonzero probabilities
- can be both mutually exclusive and independent
  - can not be both mutually exclusive and independent
  - are always mutually exclusive
  - are always independent

ANS: B

PTS: 1

TOP: Probability Concepts

38. If A and B are independent events with  $P(A) = 0.65$  and  $P(A \cap B) = 0.26$ , then,  $P(B) =$
- 0.400
  - 0.169
  - 0.390
  - 0.650

ANS: A

PTS: 1

TOP: Probability Concepts

39. If two events are independent, then
- they must be mutually exclusive
  - the sum of their probabilities must be equal to one
  - their intersection must be zero
  - None of these alternatives is correct.

ANS: D

PTS: 1

TOP: Probability Concepts

40. The multiplication law is potentially helpful when we are interested in computing the probability of
- mutually exclusive events
  - the intersection of two events
  - the union of two events
  - conditional events

ANS: B

PTS: 1

TOP: Probability Concepts

41. If A and B are independent events with  $P(A) = 0.4$  and  $P(B) = 0.6$ , then  $P(A \cap B) =$
- 0.76
  - 1.00
  - 0.24
  - 0.20

ANS: C

PTS: 1

TOP: Probability Concepts

42. If A and B are independent events with  $P(A) = 0.05$  and  $P(B) = 0.65$ , then  $P(A \mid B) =$
- 0.05
  - 0.0325
  - 0.65
  - 0.8

ANS: A

PTS: 1

TOP: Probability Concepts

43. If A and B are independent events with  $P(A) = 0.4$  and  $P(B) = 0.25$ , then  $P(A \cup B) =$
- a. 0.65
  - b. 0.55
  - c. 0.10
  - d. 0.75

ANS: B

PTS: 1

TOP: Probability Concepts

44. If A and B are independent events with  $P(A) = 0.38$  and  $P(B) = 0.55$ , then  $P(A \mid B) =$
- a. 0.209
  - b. 0.000
  - c. 0.550
  - d. 0.38

ANS: D

PTS: 1

TOP: Probability Concepts

45. If A and B are independent events with  $P(A) = 0.35$  and  $P(B) = 0.20$ , then,  $P(A \cup B) =$
- a. 0.07
  - b. 0.62
  - c. 0.55
  - d. 0.48

ANS: D

PTS: 1

TOP: Probability Concepts