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1. Which of the following probability distributions is discrete?
   a) Normal distribution
   b) Poisson distribution
   c) Exponential distribution
   d) Uniform distribution

2. What does conditional probability represent?
   a) The probability of an event occurring given that another event has occurred
   b) The probability of two independent events occurring simultaneously
   c) The probability of an event occurring in isolation
   d) The probability of an event occurring with absolute certainty

3. Bayes' theorem is used to:
   a) Calculate the probability of an event occurring given prior knowledge
   b) Determine the expected value of a random variable
   c) Find the median of a probability distribution
   d) Estimate the variance of a sample

4. In Bayes' theorem, P(A|B) represents:
   a) The probability of event A occurring given event B has occurred
   b) The probability of event B occurring given event A has occurred
   c) The joint probability of events A and B occurring
   d) The marginal probability of event A

5. Which of the following statements is true about the normal distribution?
   a) It is a discrete probability distribution
   b) It is symmetric around its mean
   c) It is only applicable to small sample sizes
   d) It has a fixed range of possible values

6. Which of the following statements about the Poisson distribution is true?
   a) It is used to model continuous random variables.
   b) It is only applicable to finite sample sizes.
   c) It is characterised by a mean and standard deviation.
   d) It is used to model the number of events occurring in a fixed interval of time or space.

7. If events A and B are independent, what is P(A and B)?
   a) P(A) * P(B)
   b) P(A) + P(B)
   c) P(A) - P(B)
   d) P(A) / P(B)

8. A conditional probability of 0 means:
   a) The events are certain to occur together.
   b) The events are independent.
   c) The events cannot occur together.
   d) The events have no relationship.

9. What does the variance of a probability distribution measure?
   a) The spread or dispersion of the distribution
   b) The likelihood of an event occurring
   c) The average of the squared deviations from the mean
   d) The probability of the mean value occurring

10. In a binomial distribution, the parameters are:
   a) Mean and standard deviation
   b) Sample size and probability of success
   c) Median and mode
   d) Variance and range

11. If two events are mutually exclusive, what is the probability of both events occurring?
   a) 0
   b) 1
   c) 0.5
   d) Depends on the specific events

12. What does the area under a probability density function (PDF) represent?
   a) The probability of a specific outcome occurring
   b) The mean of the distribution
   c) The median of the distribution
   d) The total probability space

13. Which of the following is a property of the exponential distribution?
   a) It is symmetric around its mean.
   b) It is used to model the time until the next event occurs.
   c) It is a discrete distribution.
   d) It has a fixed range of possible values.

14. When applying Bayes' theorem, what does P(B|A) represent?
   a) The prior probability of event B occurring.
   b) The probability of event A occurring given event B has occurred.
   c) The joint probability of events A and B occurring.
   d) The marginal probability of event B.

15. In a uniform distribution, the probability density function is:
   a) Constant within a specified range.
   b) Skewed to the left.
   c) Skewed to the right.
   d) Bell-shaped.

16. Which of the following statements about the Bernoulli distribution is true?
   a) It models the number of successes in a fixed number of independent trials.
   b) It is characterised by two parameters: mean and variance.
   c) It is a continuous probability distribution.
   d) It is used to model continuous random variables.

17. What is the formula for conditional probability?
a) P(A and B) = P(A) * P(B)
b) P(A | B) = P(A) + P(B) - P(A and B)
c) P(A | B) = P(A) * P(B)
d) P(A and B) = P(A | B) * P(B)

18. In a normal distribution, approximately what percentage of the data lies within one standard deviation of the mean?
a) 25%
b) 50%
c) 68%
d) 95%

19. When do we use the binomial distribution?
a) When the number of trials is fixed and the probability of success is constant.
b) When the number of trials is infinite.
c) When the probability of success changes with each trial.
d) When the outcomes are continuous.

20. What does the cumulative distribution function (CDF) represent?
a) The probability of an event occurring exactly at a specified value.
b) The probability of an event occurring within a specified range.
c) The mean of the distribution.
d) The total number of trials in the distribution.

21. A bag contains 8 red balls and 5 blue balls. If one ball is drawn at random from the bag, what is the probability that it is red?
a) 5/13
b) 8/13
c) 8/5
d) 5/8

22. A standard deck of playing cards contains 52 cards. What is the probability of drawing a heart or a spade from the deck?
a) 13/52
b) 26/52
c) 39/52
d) 52/52

23. An experiment has 3 equally likely outcomes. What is the probability of getting the first outcome twice in a row?
a) 1/3
b) 1/9
c) 1/6
d) 1/2

24. A jar contains 10 red marbles, 8 blue marbles, and 6 green marbles. If one marble is drawn at random from the jar, what is the probability that it is either red or green?
a) 4/12
b) 5/12
c) 7/12
d) 9/12

25. A fair coin is flipped three times. What is the probability of getting exactly two heads?
a) 1/8
b) 1/4
c) 3/8
d) 1/2