- 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

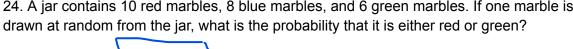
Certainly, here are 15 more multiple-choice questions:

- 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)  $P(A \mid B) = P(A) + P(B) P(A \text{ and } B)$
  - c) P(A | B) = P(A) \* P(B)
  - d)  $P(A \text{ and } B) = P(A \mid B) * P(B)$
- 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







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