## **Probability and Statistics Objective Question Paper**

**Time: 60 minutes**  
**Total Marks: 50**

### Section A: (10 Marks)

1. **What is the probability of getting a head when flipping a fair coin?** a) 0  
   b) 0.25  
   c) 0.5  
   d) 1  
   **Answer: c) 0.5**
2. **In a deck of 52 cards, what is the probability of drawing an Ace?** a) 1/13  
   b) 1/4  
   c) 1/52  
   d) 1/26  
   **Answer: a) 1/13**
3. **Two dice are rolled. What is the probability of getting a sum of 7?** a) 1/36  
   b) 1/12  
   c) 1/6  
   d) 1/8  
   **Answer: c) 1/6**
4. **If events A and B are independent, the probability of both A and B occurring is:** a) P(A) + P(B)  
   b) P(A) \* P(B)  
   c) P(A) / P(B)  
   d) P(A) - P(B)  
   **Answer: b) P(A) \* P(B)**
5. **Which of the following distributions is used for modeling the number of times an event occurs in a fixed interval of time or space?** a) Binomial distribution  
   b) Poisson distribution  
   c) Normal distribution  
   d) Uniform distribution  
   **Answer: b) Poisson distribution**
6. **The mean of a probability distribution is also known as:** a) Mode  
   b) Median  
   c) Expected value  
   d) Standard deviation  
   **Answer: c) Expected value**
7. **What is the variance of a probability distribution?** a) The average of the squared deviations from the mean  
   b) The square root of the mean  
   c) The median value  
   d) The sum of all values  
   **Answer: a) The average of the squared deviations from the mean**
8. **In a standard normal distribution, the mean is:** a) 0  
   b) 1  
   c) -1  
   d) Depends on the data  
   **Answer: a) 0**
9. **Bayes' theorem is used to:** a) Find the probability of A and B occurring together  
   b) Update the probability estimate for an event based on new information  
   c) Calculate the probability of mutually exclusive events  
   d) Determine the variance of a dataset  
   **Answer: b) Update the probability estimate for an event based on new information**
10. **Which of the following is true for a probability density function (PDF)?** a) It always sums to 1  
    b) It is always non-negative  
    c) It represents discrete probabilities  
    d) It is always less than 1  
    **Answer: b) It is always non-negative**

### Section B: Descriptive Statistics (10 Marks)

1. **What is the median of the following data set: [3, 1, 4, 1, 5, 9, 2]?** a) 3  
   b) 4  
   c) 5  
   d) 1  
   **Answer: a) 3**
2. **The measure of central tendency most affected by outliers is:** a) Mean  
   b) Median  
   c) Mode  
   d) Range  
   **Answer: a) Mean**
3. **Which of the following measures the spread of a data set?** a) Mean  
   b) Median  
   c) Standard deviation  
   d) Mode  
   **Answer: c) Standard deviation**
4. **The interquartile range (IQR) is the difference between:** a) The maximum and minimum values  
   b) The mean and median  
   c) The first and third quartiles  
   d) The median and mode  
   **Answer: c) The first and third quartiles**
5. **If the data set [2, 4, 6, 8, 10] is transformed by adding 5 to each value, the new mean is:** a) 7  
   b) 10  
   c) 12  
   d) 15  
   **Answer: c) 12**

### Section C: Inferential Statistics (30 Marks)

1. **The process of using sample data to make general statements about a population is called:** a) Descriptive statistics  
   b) Inferential statistics  
   c) Data mining  
   d) Probability  
   **Answer: b) Inferential statistics**
2. **A confidence interval provides:** a) A range of values that is likely to contain the population parameter  
   b) The exact value of the population parameter  
   c) The variance of the population  
   d) The probability of a sample mean  
   **Answer: a) A range of values that is likely to contain the population parameter**
3. **The null hypothesis in hypothesis testing typically states that:** a) There is a significant effect or difference  
   b) There is no effect or difference  
   c) The sample mean is greater than the population mean  
   d) The sample mean is less than the population mean  
   **Answer: b) There is no effect or difference**
4. **What is the p-value in hypothesis testing?** a) The probability of rejecting the null hypothesis when it is true  
   b) The probability of obtaining the observed results, assuming the null hypothesis is true  
   c) The probability of accepting the null hypothesis when it is false  
   d) The probability of the sample mean being equal to the population mean  
   **Answer: b) The probability of obtaining the observed results, assuming the null hypothesis is true**
5. **A type I error occurs when:** a) The null hypothesis is incorrectly rejected  
   b) The null hypothesis is incorrectly accepted  
   c) The sample size is too small  
   d) The confidence level is too high  
   **Answer: a) The null hypothesis is incorrectly rejected**
6. **In a normal distribution, approximately what percentage of data falls within one standard deviation of the mean?** a) 50%  
   b) 68%  
   c) 95%  
   d) 99%  
   **Answer: b) 68%**
7. **In hypothesis testing, which of the following is a Type I error?** a) Failing to reject a true null hypothesis  
   b) Rejecting a true null hypothesis  
   c) Failing to reject a false null hypothesis  
   d) Rejecting a false null hypothesis  
   **Answer: b) Rejecting a true null hypothesis**
8. **A company wants to test the effectiveness of a new drug. They conduct a study with 200 participants, randomly assigning 100 to receive the drug and 100 to receive a placebo. The p-value obtained from the study is 0.03. What does this p-value indicate?** a) There is a 3% chance that the drug is effective.  
   b) There is a 3% chance that the observed effect is due to random variation.  
   c) There is a 97% chance that the drug is effective.  
   d) There is a 97% chance that the observed effect is due to random variation.  
   **Answer: b) There is a 3% chance that the observed effect is due to random variation.**
9. **Which of the following methods can be used to handle missing data in a dataset?** a) Removing rows with missing values  
   b) Imputing missing values using mean or median  
   c) Using machine learning algorithms to predict missing values  
   d) All of the above  
   **Answer: d) All of the above**
10. **A dataset has a mean of 50 and a standard deviation of 10. If we add a constant value of 5 to each data point, what will be the new mean and standard deviation?** a) Mean = 55, Standard Deviation = 10  
    b) Mean = 50, Standard Deviation = 15  
    c) Mean = 55, Standard Deviation = 15  
    d) Mean = 50, Standard Deviation = 10  
    **Answer: a) Mean = 55, Standard Deviation = 10**