Test Paper

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Subject: Math
Topic: Probability
Number of Questions: 15
Optional Details: Hard, MCQ

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1. **MCQ (Easy):** A bag contains 3 red and 5 blue marbles. If one marble is randomly selected, what is the probability of selecting a red marble?

2. **MCQ (Medium):** A fair six-sided die is rolled twice. What is the probability of rolling a 2 on the first roll and a 4 on the second roll?

3. **Open-ended (Hard):** A box contains 10 balls, 5 of which are white and 5 of which are black. Two balls are drawn successively without replacement. What is the probability of drawing two white balls?

4. **MCQ (Easy):** A coin is flipped 4 times. What is the probability of getting exactly 2 heads?

5. **MCQ (Medium):** A game of chance consists of rolling a die and flipping a coin. What is the probability of rolling a 6 on the die and getting tails on the coin?

6. **Open-ended (Hard):** A lottery ticket has 6 numbers chosen from 1 to 49. If the winning numbers are randomly drawn, what is the probability of matching all 6 numbers?

7. **MCQ (Easy):** A deck of cards contains 52 cards. What is the probability of drawing an ace?

8. **Open-ended (Medium):** A bag contains 3 red balls, 2 blue balls, and 1 green ball. If two balls are drawn at random without replacement, what is the probability of drawing one red ball and one blue ball?

9. **MCQ (Hard):** A fair coin is flipped n times. What is the probability of getting at least one head?

10. **Open-ended (Hard):** Suppose you roll a six-sided die and then flip a coin. Let X be the random variable representing the outcome of the die and Y be the random

variable representing the outcome of the coin. What is the joint probability distribution of X and Y?

11. **MCQ (Medium):** A factory produces light bulbs, 5% of which are defective. If a batch of 20 light bulbs is randomly selected, what is the probability of selecting at least one defective bulb?

12. **Open-ended (Hard):** A company surveys 100 employees and finds that 60 of them prefer coffee, 30 prefer tea, and 10 prefer both coffee and tea. If one employee is randomly selected, what is the probability that they prefer coffee or tea?

13. **MCQ (Easy):** A random number between 1 and 10 (inclusive) is generated. What is the probability of the number being odd?

14. **Open-ended (Medium):** A group of 10 people is divided into two teams of 5. What is the probability that two specific people are on the same team?

15. **MCQ (Hard):** A person is dealt 5 cards from a standard deck of 52 cards. What is the probability of having a full house (three of one kind and two of another)?