GCSE Probability Practice Questions SET 3

Basic Probability

1. What is the probability of rolling an even number on a fair six-sided die?

2. A coin is flipped twice. What is the probability of getting exactly one head?

3. A bag has 3 red, 5 blue, and 2 green balls. What is the probability of drawing a blue ball?

4. A spinner is divided into 4 equal parts numbered 1 to 4. What is the probability it lands on number 3?

5. Two coins are tossed. What is the probability of getting two tails?

6. A card is drawn from a standard 52-card deck. What is the probability it is a heart?

7. If the probability of rain today is 0.3, what is the probability it does not rain?

8. A jar contains candies: 5 chocolates, 8 gummies, and 7 mints. If one candy is chosen at random, what is the probability it is not a chocolate?

9. What is the complement of drawing a spade from a deck?

10. If the probability of drawing a face card or a 10 is 4/13, what is the probability of NOT drawing a face card or a 10?

Combined and Sequential Events

11. Two dice are rolled. What is the probability that the sum of the numbers is 7?

12. A bag contains 10 balls: 6 red and 4 yellow. Two balls are drawn one after the other, without replacement. What is the probability both are red?

13. Two coins are tossed. What is the probability of getting exactly one head?

14. Two dice are rolled. What is the probability both show the same number?

15. A die is rolled, and a card is drawn from a deck. What is the probability the die shows 3 and the card is a heart?

16. Two cards are drawn from a deck without replacement. What is the probability both are kings?

17. If event A and B are independent with given probabilities, what is P(A and B)?

18. Calculate the probability of getting a sum of 6 when rolling two dice.

19. There is a bag with green and blue marbles. The probability of drawing a green marble is 0.4. After adding more green marbles, the probability becomes 0.6. Find the original number of green marbles if total marbles are 20.

20. A ball is randomly selected from a bag with red, blue, yellow, and green balls. The probability it is green is 0.2, and the probability it is not yellow equals 0.8. What is the probability it is red?

Conditional Probability and Venn Diagrams

21. In a class, 18 students prefer football and 12 prefer basketball. 10 students prefer both. What is the probability a student chosen at random prefers football but not basketball?

22. A biased coin lands heads with probability 0.4. What is the probability it lands tails?

23. Given that a marble drawn is red, what is the probability it is also large, assuming specific statistical data?

24. Two events A and B are mutually exclusive with probabilities 0.2 and 0.3. Find P(A or B).

25. The probability of event C occurring is 0.7. What is the probability that C does not occur?

26. A drawer contains 5 red and 5 blue balls. Two drawn with replacement; what is the probability both are red?

27. Two dice are rolled. What is the probability that the sum is a multiple of 3?

28. An urn contains 10 balls: 4 red, 3 blue, 3 yellow. Two balls are drawn without replacement; find the probability both are yellow.

29. A bag with 4 red and 6 blue marbles. Two marbles are drawn, one after the other, with replacement. What is the probability both are blue?

30. A die is rolled twice. Find the probability the sum is greater than 9.

Tree Diagrams and Expectation

31. A spinner has 4 sectors with probabilities 0.1, 0.2, 0.3, 0.4. Find the probability it lands on each sector after 3 spins.

32. In a game, the probability of winning on any round is 0.25. What is the probability of winning exactly 2 times in 5 rounds?

33. A tree diagram shows branching outcomes with different probabilities; calculate the combined chance for specific paths.

34. Expectancy: If a game pays £2 for winning and costs £1 to play, with winning probability 0.3, what is the expected profit per game?

35. A biased coin lands heads with probability 0.6. Find the probability it lands heads exactly 3 times in 5 flips.

36. The probability of winning a raffle is 0.05 each ticket. What is the probability of winning at least once in 10 tickets?

37. A spinner is spun twice. Calculate the probability that the sum of the outcomes is 5 or 7.

38. The probability that a student passes a test is 0.8. What is the probability that a student passes at least two tests out of three?

39. A darts game has a success rate of 0.7 for each throw. What is the probability that the player scores at least 2 successes in 3 throws?

40. Using a probability tree, find the probability of two consecutive failures in a two-stage process with success probability 0.9.

Expected Value and Binomial Distributions

41. Calculate the expected number of heads when flipping a coin 10 times.

42. What is the probability of getting exactly 4 successes out of 8 trials with success probability 0.5?

43. A player rolls a die 20 times; what is the expected number of sixes?

44. In a binomial distribution with n=10 and p=0.4, find the probability of 3 successes.

45. Calculate the probability of at least 2 successes in 6 trials, success probability 0.5.

46. A basketball player has a free throw success rate of 0.75. What is the probability they make exactly 4 out of 5 attempts?

47. Calculate the probability of zero successes in 4 trials with success rate 0.6.

48. A machine produces 500 widgets, with a 2% defect rate. Expect how many defective widgets?

49. The average score of students in a test is 75, with standard deviation 10, assume normal distribution. What percentage scored above 85?

50. The average height of a population is 170 cm with SD=10 cm. Find the percentage taller than 180 cm using normal distribution principles.

Additional Application and Word Problems

51. An airline's success rate for landing safely is 0.98. Find the probability of at least one successful landing in 3 flights.

52. In a factory, machines produce pistols in batches. The defect rate is 3%. What's the probability that in a batch of 100, more than 5 are defective?

53. A survey shows 55% of people prefer product A. If 8 people are sampled, what is the probability that at least 4 prefer A?

54. A computer failure occurs with probability 0.01 in a day. What is the probability of failure at least once in 30 days?

55. A card is drawn from a deck. If all face cards are removed, what is the new probability of drawing a king?

56. The distribution of exam scores is approximately normal. If the mean score is 70, SD 8, what percentage scored below 60?

57. The average daily sales at a shop is £300 with SD of £50. Find the probability total sales exceed £350.

58. In a game, the chance of winning a prize is 10%. Find the probability of winning exactly 3 prizes in 20 attempts.

59. In a restaurant, 60% customers order coffee. If 60 customers are served, what is the probability that at least 40 ordered coffee?

60. A spinner has 8 segments with different probabilities. Calculate the probability it lands on the segment with 0.15 chance.

GCSE Probability Practice Questions: 61 to 100

61. For two events A and B, $P(A) = 3/5$ and $P(B|A) = 2/7$. Find $P(A$ and $B)$.

62. The probability a student plays football but no rugby is 1/4, rugby but no football is 1/6, and the events are independent. Given 324 kids play both, estimate the number of kids who play neither.

63. Given a box has 8 pencils: 5 blue and 3 red. Simon picks one, Hazel picks after without replacement: find probability both pick red.

64. Sue rolls a dice six times recording frequency of each face; explain why her experimental results don't conclusively show bias.

65. Train delay probabilities: late leaving Swindon 1/5, late arrival in London if late leaving is 7/10, late arrival if not late leaving 1/10. Find probability train is late arriving in London.

66. Probability Amy and Greg pick same color ball from bags with given counts.

67. Calculate probability Amy's score is higher than Greg's in a dice game.

68. Number of chocolates problem: given probability of mint chocolates, find total chocolates.

69. Number of pairs of matching dice rolls out of 36 possible pairs.

70. Explain the difference between experimental and theoretical probability.

71. A probability problem involving red and blue counters and finding an unknown 'x'.

72. Calculate the probability of rolling a sum of 12 on two dice.

73. Find the complement of rolling a prime number.

74. Probability of bias in repeated coin tosses with given frequencies.

75. Probability of drawing red then blue or blue then red from a bag.

76. Homework submission problem with multiple subjects and probability of all or none submitting.

77. Probability problem involving kids playing football, rugby, or both using sets intersection.

78. Drawing probability problem with given colored counters and given compound probability.

79. Probability that James wears both a jacket and tie, based on provided probabilities.

80. Tree diagram for probability of different outcomes involving homework.

81. Calculate the probability a person chosen at random likes 100m Athletics given counts by gender.

82. Given survey liking pizza, find probability someone only likes pepperoni if likes pepperoni.

83. Expression for probability of drawing one red and one blue marble from bag with n red marbles.

84. Calculate probability of two consecutive successes in a described situation.

85. Probability a maths student passes all subjects and also none.

86. Calculate joint, conditional, and complementary probabilities given events A and B.

87. Find probability of passing a test for two students with given pass probabilities.

88. Calculate chance of drawing a particular color over multiple draws without replacement.

89. Probability of drawing balls of different colors in sequence.

90. Probability problems related to dice outcomes and relative frequencies.

91. Write expressions and solve quadratic probability problems involving times of events.

92. Probability of getting exactly a certain number of successes in multiple independent trials.

93. Binomial expansion related to probability of outcomes in repeated events.

94. Calculate expected wins in a large number of repeated trials.

95. Probability upper bound estimation for outliers in a set of outcomes.

96. Tree diagram for probability of consecutive draws from different colored balls.

97. Experimental probability vs theoretical probability explanation.

98. Probability calculations on combined events using multiplication and addition rules.

99. Probability question solving missing values using algebraic expressions.

100.   Use of probability in real-life scenario questions involving multi-step events.