MATHS

BOOKS - PSEB

PROBABILITY

Exercise

1. In the following , describe the sample space for the indicated experiment. A coin is tossed three times.

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2. In the following , describe the sample space for the indicated experiment. . A die is thrown two times.

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3. In the following , describe the sample space for the indicated experiment. A coin is tossed four times.

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4. In the following , describe the sample space for the indicated experiment. A coin is tossed and a die is thrown.

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5. In the following , describe the sample space for the indicated experiment. A coin is tossed and then a die is rolled only in case a head is shown on the coin.

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6. In the following , describe the sample space for the indicated experiment. 2 boys and 2 girls are in Room X, and 1 boy and 3 girls in Room Y. Specify the sample space for the experiment in which a room is selected and then a person.

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7. In the following , describe the sample space for the indicated experiment. One die of red colour, one of white colour and one of blue colour are placed in a bag. One die isselected at random and rolled, its colour and the number on its uppermost face is noted. Describe the sample space.

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8. An experiment consists of recording boy-girl composition of families with 2 children. What is the sample space if we are interested in knowing whether it is a boy or girl in the order of their births?

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9. An experiment consists of recording boy-girl composition of families with 2 children. What

is the sample space if we are interested in the number of girls in the family?

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10. A box contains 1 red and 3 identical white balls. Two balls are drawn at random in succession without replacement. Write the sample space for this experiment.

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11. An experiment consists of tossing a coin and then throwing it second time if a head occurs. If a tail occurs on the first toss, then a die is rolled once. Find the sample space.

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12. Suppose 3 bulbs are selected at random from a lot. Each bulb is tested and classified as defective (D) or non -defective(N). Write the sample space of this experiment.

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13. A coin is tossed. If the out come is a head, a die is thrown. If the die shows up an even number, the die is thrown again. What is the sample space for the experiment?

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14. The numbers 1, 2, 3 and 4 are written separatly on four slips of paper. The slips are put in a box and mixed thoroughly. A person

draws two slips from the box, one after the other, without replacement. Describe the sample space for the experiment.

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15. An experiment consists of rolling a die and then tossing a coin once if the number on the die is even. If the number on the die is odd, the coin is tossed twice. Write the sample space for this experiment.

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16. A coin is tossed. If it shows a tail, we draw a ball from a box which contains 2 red and 3 black balls. If it shows head, we throw a die. Find the sample space for this experiment.

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17. A die is thrown repeatedly untill a six comes up. What is the sample space for this experiment?

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18. A die is rolled. Let E be the event “die shows 4” and F be the event “die shows even number”. Are E and F mutually exclusive?

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19. A die isthrown. Describe the following event : A: a number less than 7

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20. A die isthrown. Describe the following event : B: a number greater than 7

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21. A die is thrown. Describe the following event : C: a multiple of 3

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22. A die is thrown. Describe the following event : D: a number less than 4

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23. A die is thrown. Describe the following event : E: an even number greater than 4

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24. A die is thrown. Describe the following event : F: a number not less than 3

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25. An experiment involves rolling a pair of dice and recording the numbers that come up. Describe the following events: A: the sum is greater than 8, B: 2 occurs on either die C: the sum is at least 7 and a multiple of 3. Which pairs of these events are mutually exclusive?

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26. Three coins are tossed once. Let A denote the event 'three heads show", B denote the event "two heads and one tail show", C denote the event" three tails show and D denote the event 'a head shows on the first coin". Which events are mutually exclusive?

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27. Three coins are tossed once. Let A denote the event ‘three heads show”, B denote the event “two heads and one tail show”, C denote the event” three tails show and D denote the event ‘a head shows on the first coin”. Which events are simple?

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28. Three coins are tossed once. Let A denote the event ‘three heads show”, B denote the

event “two heads and one tail show”, C denote the event” three tails show and D denote the event ‘a head shows on the first coin”. Which events are Compound?

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29. Three coins are tossed. Describe Two events which are mutually exclusive.

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30. Three coins are tossed. Describe Three events which are mutually exclusive and exhaustive.

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31. Three coins are tossed. Describe Two events, which are not mutually exclusive.

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32. Three coins are tossed. Describe Two events which are mutually exclusive but not exhaustive.

33. Three coins are tossed. Describe Three events which are mutually exclusive but not exhaustive.

34. Two dice are thrown. The events A, B and C are as follows: A: getting an even number on the first die. B: getting an odd number on the first die. C: getting the sum of the numbers on the dice ≤ 5.Describe the event:- A'

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35. Two dice are thrown. The events A, B and C are as follows: A: getting an even number on the first die. B: getting an odd number on the

first die. C: getting the sum of the numbers on the dice ≤ 5.Describe the event:- not B

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36. Two dice are thrown. The events A, B and C are as follows: A: getting an even number on the first die. B: getting an odd number on the first die. C: getting the sum of the numbers on the dice ≤ 5.Describe the event:- A or B

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37. Two dice are thrown. The events A, B and C are as follows: A: getting an even number on the first die. B: getting an odd number on the first die. C: getting the sum of the numbers on the dice ≤ 5.Describe the event:- A and B

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38. Two dice are thrown. The events A, B and C are as follows: A: getting an even number on the first die. B: getting an odd number on the

first die. C: getting the sum of the numbers on the dice ≤ 5.Describe the event:- A but not C

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39. Two dice are thrown. The events A, B and C are as follows: A: getting an even number on the first die. B: getting an odd number on the first die. C: getting the sum of the numbers on the dice ≤ 5.Describe the event:- B or C

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40. Two dice are thrown. The events A, B and C are as follows: A: getting an even number on the first die. B: getting an odd number on the first die. C: getting the sum of the numbers on the dice ≤ 5.Describe the event:- B and C

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41. Two dice are thrown. The events A, B and C are as follows: A: getting an even number on the first die. B: getting an odd number on the

first die. C: getting the sum of the numbers on the dice ≤ 5.Describe the event:- $A \cap B' \cap C$

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42. Two dice are thrown. The events A, B and C are as follows: A: getting an even number on the first die. B: getting an odd number on the first die. C: getting the sum of the numbers on the dice ≤ 5. state true or false: (give reason for your answer):- A and B are mutually exclusive

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43. Two dice are thrown. The events A, B and C are as follows: A: getting an even number on the first die. B: getting an odd number on the first die. C: getting the sum of the numbers on the dice ≤ 6. state true or false: (give reason for your answer):- A and B are mutually exclusive and exhaustive

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44. Two dice are thrown. The events A, B and C are as follows: A: getting an even number on the first die. B: getting an odd number on the first die. C: getting the sum of the numbers on the dice ≤ 7. state true or false: (give reason for your answer):- A = B'

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45. Two dice are thrown. The events A, B and C are as follows: A: getting an even number on

the first die. B: getting an odd number on the first die. C: getting the sum of the numbers on the dice ≤ 9. state true or false: (give reason for your answer):- A and B' are mutually exclusive.

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46. Two dice are thrown. The events A, B and C are as follows: A: getting an even number on the first die. B: getting an odd number on the first die. C: getting the sum of the numbers on

the dice ≤ 10. state true or false: (give reason for your answer):- A',B', C are mutually exclusive and exhaustive.

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47. Which of the following can not be valid assignment of probabilitiesfor outcomes of sample Space S = $\{\omega_1, \omega_2, \omega_3, \omega_4, \omega_5, \omega_6, \omega_7\}$

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48. A coin is tossed twice, what is the probability that atleast one tail occurs?

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49. A die is thrown, find the probability of following event :- A prime number will appear.

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50. A die is thrown, find the probability of following event :- A number greater than or equal to 3 will appear.

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51. A die is thrown, find the probability of following event :- A number less than or equal to one will appear.

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52. A die is thrown, find the probability of following event :- A number more than 6 will appear.

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53. A die is thrown, find the probability of following event :- A number less than 6 will appear.

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54. A card is selected from a pack of 52 cards. How many points are there in the sample space?

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55. A card is selected from a pack of 52 cards. Calculate the probability that the card is an ace of spades.

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56. A card is selected from a pack of 52 cards. Calculate the probability that the card is (i) an ace (ii) black card.

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57. A fair coin with 1 marked on one face and 6 on the other and a fair die are both tossed, find the probability that the sum of numbers that turn up is (i) 3 (ii) 12

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58. There are four men and six women on the city council. If one council member isselected for a committee at random, how likely is it that it is a woman?

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59. Three coins are tossed once. Find the probability of getting:- 3 heads

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60. Three coins are tossed once. Find the probability of getting:- 2 heads

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61. Three coins are tossed once. Find the probability of getting:- atleast 2 heads

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62. Three coins are tossed once. Find the probability of getting:- atmost 2 heads

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63. Three coins are tossed once. Find the probability of getting:- no head

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64. Three coins are tossed once. Find the probability of getting:- 3 tails

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65. Three coins are tossed once. Find the probability of getting:- exactly two tails

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66. Three coins are tossed once. Find the probability of getting:- no tail

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67. Three coins are tossed once. Find the probability of getting:- atmost two tails

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68. If $\frac{2}{11}$ is the probability of an event, what is the probability of the event 'not A'.

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69. A letter is chosen at random from the word 'ASSASSINATION'. Find the probability that letter is (i) a vowel (ii) a consonant

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70. In a lottery, a person choses six different natural numbers at random from 1 to 20, and if these six numbers match with the six numbers already fixed by the lottery committee, he winsthe prize. What is the probability of winning the prize in the game? [Hint order of the numbers is not important.]

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71. Check whether the following probabilities P(A) and P(B) are consistently defined:- P(A) = 0.5, P(B) = 0.7, $P(A \cap B)$ = 0.6

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72. Check whether the following probabilities P(A) and P(B) are consistently defined:- P(A) = 0.5, P(B) = 0.4, $P(A \cup B)$ = 0.8

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73. Given P(A) =3/5 and P(B) =1/5. Find P(A or B), if A and B are mutually exclusive events.

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74. If E and F are events such that P(E) =1/4, P(F) =1/2 and P(E and F) =1/8, find (i) P(E or F), (ii) P(not E and not F).

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75. Events E and F are such that P(not E or not F) = 0.25, State whether E and F are mutually exclusive.

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76. A and B are events such that P(A) = 0.42, P(B) = 0.48 and P(A and B) = 0.16. Determine (i) P(not A), (ii) P(not B) and (iii) P(A or B)

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77. In Class XI of a school 40% of the students study Mathematics and 30% study Biology. 10% of the class study both Mathematics and Biology. If a student is selected at random from the class, find the probability that he will be studying Mathematics or Biology.

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78. In an entrance test that is graded on the basis oftwo examinations, the probability of a randomly chosen student passing the first

examination is 0.8 and the probability of passing the second examination is 0.7. The probability of passing atleast one of them is 0.95. What isthe probability of passing both?

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79. The probability that a student will pass the final examination in both English and Hindi is 0.5 and the probability of passing neither is 0.1. If the probability of passing the English

examination is 0.75, what is the probability of passing the Hindi examination?

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80. In a class of 60 students, 30 opted for NCC, 32 opted for NSS and 24 opted for both NCC and NSS. If one of these students is selected at random, find the probability that The student opted for NCC or NSS.

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81. In a class of 60 students, 30 opted for NCC, 32 opted for NSS and 24 opted for both NCC and NSS. If one of these students is selected at random, find the probability that The student has opted neither NCC nor NSS.

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82. A box contains 10 red marbles, 20 blue marbles and 30 green marbles. 5 marbles are drawn from the box, what isthe probability

that (i) all will be blue? (ii) atleast one will be green?

83. 4 cards are drawn from a well -shuffled deck of 52 cards. What is the probability of obtaining 3 diamonds and one spade?

84. A die has two faces each with number '1', three faces each with number '2' and one face with number '3'. If die is rolled once, determine P(2)

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85. A die has two faces each with number '1', three faces each with number '2' and one face with number '3'. If die is rolled once, determine P(1 or 3)

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86. A die has two faces each with number '1', three faces each with number '2' and one face with number '3'. If die is rolled once, determine P(not 3)

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87. In a certain lottery 10,000 tickets are sold and ten equal prizes are awarded. What is the

probability of not getting a prize if you buy (a) one ticket (b) two tickets (c) 10 tickets.

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88. Out of 100 students, two sections of 40 and 60 are formed. If you and your friend are among the 100 students, what is the probability that you both enter the same section?

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89. Out of 100 students, two sections of 40 and 60 are formed. If you and your friend are among the 100 students, what is the probability that you both enter the different sections?

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90. A and B are two events such that P(A) = 0.54, P(B) = 0.69 and $P(A \cap B)$ = 0.35. Find:-

$P(A \cup B)$

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91. A and B are two events such that P(A) = 0.54, P(B) = 0.69 and $P(A \cap B)$ = 0.35. Find:- $P(A' \cap B')$

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92. A and B are two events such that P(A) = 0.54, P(B) = 0.69 and $P(A \cap B)$ = 0.35. Find:- $P(A \cap B')$

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93. A and B are two events such that P(A) = 0.54, P(B) = 0.69 and $P(A \cap B)$ = 0.35. Find:-

$P(B \cap A')$

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94. If 4-digit numbers greater than 5,000 are randomly formed from the digits 0, 1,3, 5, and 7, what is the probability of forming a number divisible by 5 when, (i) the digits are repeated? (ii)the repetition of digits is not allowed?

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95. The number lock of a suitcase has 4 wheels, each labelled with ten digits i.e., from 0 to 9. The lock opens with a sequence of four digits with no repeats. What is the probability of a person getting the right sequence to open the suitcase?

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