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MATHS

NCERT - NCERT MATHEMATICS(ENGLISH)

PROBABILITY

Exercise 15 1

1. The distances (in km) of 30 female engineers from their residence to their place of work

were found as follows: 5 3 10 20 25 11 13 7 12 31 19 10 12 17 18 11 32 17 16 2 12 14 2 9 6 15 15 7 6 2 Find the probability that an engineer lives: (i) less than 7 km from her place of work? (ii) at least 7km from her place of work? (iii) within $\frac{1}{2}km$ from her place of work? (iv) at most 15km from her place of work?

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2. Three coins are tossed simultaneously 200 times with the following frequencies of

different outcomes: Outcome: 3 heads 2 heads 1 head No head Frequency: 23 72 77 28 Find the probability of getting: (i) three heads (ii) two heads and one tail (iii) at least two heads

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3. A company selected 2400 families at random and survey them to determine a relationship between income level and the number of vehicles in a home. The information gathered is listed in the table below: Monthly income (in

Rs.) Vehicles per family 0 1 2 Above 2 Less than 7000 10 160 25 0 7000-10000 0 305 27 2 10000-13000 1 535 29 1 13000-16000 2 469 29 25 16000 or more 1 579 82 88 If a family is chosen, find the probability that the family is: earning Rs. 10000-13000 per month and owning exactly 2 vehicles. earning Rs. 16000 or more per month and owning exactly 1 vehicles. Earning less than Rs. 7000 per month and does not own any vehicle. Earning Rs. 13000-16000 per month and owning more than 2 vehicle. owning not more than 1 vehicle owning at least one vehicle.

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4. Refer to Table 14.7, Chapter 14.(i) Find the probability that a student obtained less than 20% in the mathematics test.(ii) Find the probability that a student obtained marks 60 or above.

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5. To know the opinion of the students about Mathematics, a survey of 200 students was conducted. The data is recorded in the following table: Opinion: Like Dislike No. of students 135 65 Find the probability that a student chosen at random (i) like Mathematics (ii) does not like it.

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6. In a cricket match, a bats woman hits a boundary 6 times out of 30 balls she plays. Find the probability that she did not hit a boundary.

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7. 1500 families with 2 children were selected randomly and the following data were recorded: No. of girls in a family 0 1 2 No. of families: 211 814 475 If a family is chosen at

random, compute the probability that it has: (i) No girl (ii) 1 girl (iii) 2 girls (iv) at most one girl

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8. Refer to Example 5, Section 14.4, Chapter 14. Find the probability that a student of the class was born in August.

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9. In Q.1, Exercise 14.2, you were asked to prepare a frequency distribution table regarding the blood groups of 30 students of a class. Use this table to determine the probability that a student of this class, selected at random, has blood group AB.

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10. Eleven bags of wheat flour, each marked 5 kg, actually contained the following weights of

flour (in kg):4.97, 5.05, 5.08, 5.03, 5.00, 5.06, 5.08, 4.98, 5.04, 5.07, 5.00Find the probability that any of these bags chosen at random contains more than 5 kg of flour.

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Solved Examples

1. Fifty seeds were selected at random from each of 5 bags of seeds, and were kept under standardised conditions favourable to

germination. After 20 days, the number of seeds which had germinated in each collection were counted and recorded as follow

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2. A die is thrown 1000 times with the frequencies for the outcomes 1, 2, 3,4, 5 and 6 as given in the following table :

$Outcome 1 2 3 4 5 6 Frequecny 179 150 157 149 175 190$

Find the probability of getting each outcome.

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3. Two coins are tossed simultaneously 500 times, and we getTwo heads : 105 timesOne head : 275 timesNo head : 120 timesFind the probability of occurrence of each of these events.

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4. A coin is tossed 1000 times with the following frequencies:Head : 455, Tail : 545Compute the probability for each event.

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5. The percentage of marks obtained by a student in the monthly unit tests are given below.Based on this data, find the probability that the student gets more than 70% marks in a unit test.

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6. A tyre manufacturing company kept a record of the distance covered before a tyre needed to be replaced. The table shows the results of 1000 cases.

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7. The record of a weather station shows that out of the past 250 onsecutivedays, its weather forecasts were correct 175 times.(i) What is the probability that on a given day it

was correct?(ii) What is the probability that it was not correct on a given day?

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8. On one page of a telephone directory, there were 200 telephone numbers. The frequency distribution of their unit place digit (for example, in the number 25828573, the unit place digit is 3) is given in Table:

Without looking at the page, the pencil is placed on one of the numbers i.e the number

it chosen at random. What is the probability that the digit in its unit place is 6?

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9. Consider the frequency distribution table (Table 14.3, Example 4, Chapter 14), which gives the weights of 38 students of a class. (i) Find the probability that the weight of a student in the class lies in the interval 46-50 kg.(ii) Give two events in this context, one having

probability 0 and the other having probability 1.

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10. An insurance company selected 2000 drivers at random (i.e., without any preference of one driver over another) in a particular city to find a relationship between age and accidents. The data obtained are given in the following table:`A g e\ o

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