Practice Assignment 2A

1. An organization selected 2288 families at random and surveyed them to determine a relationship between income level and the number of vehicles in a family. The information gathered is listed in the table below:

Monthly income (in Rs.)	Vehicles per family			
	0	1	2	Above 2
Less than 7000	8	155	20	0
7000 − 10000	0	300	17	1
10000 − 13000	1	525	26	1
13000 − 16000	2	459	49	15
16000 or more	1	559	72	77

Suppose a family is chosen, find the probability that the family chosen is

(i) earning Rs.10000 − 13000 per month and owning exactly 2 vehicles.

(ii) earning Rs. 16000 or more per month and owning exactly 1 vehicle.

(iii) earning less than Rs. 7000 per month and does not own any vehicle.

(iv) earning Rs. 13000 − 16000 per month and owning more than 2 vehicles.

(v) owning not more than 1 vehicle.

2. An organization selected 454 families at random and surveyed them to determine a relationship between savings and the number of children. The information gathered is listed in the table below:

Savings (in Rs.)	Children per family			
	0	1	2	Above 2
Less than 3000	5	55	10	0
3000 − 6000	0	30	17	1
6000 − 8000	1	52	21	1
8000 − 10000	2	45	39	10
10000 or more	1	55	52	57

Suppose a family is chosen, find the probability that the family chosen is

(i) saving Rs.6000 − 8000 per month and has exactly 2 children.

(ii) saving Rs.10000 or more per month and has exactly 1 child.

(iii) saving less than Rs.3000 per month and does not have any child.

(iv) saving Rs.8000 − 10000 per month and have more than 2 children.

3. A teacher wanted to analyse the performance of two sections of students in a chemistry test of 100 marks. Looking at their performances, she found that a few students got under 30 marks and a few got 80 marks or above. So she decided to group them into intervals of varying sizes as follows: 0 − 30, 30 – 60, …, 80 − 100. Then she formed the following table:

Marks	Number of student
0 – 30	7
30 − 40	8
40 − 50	8
50 − 60	18
60 − 70	18
70 − 80	13
80 − above	8
Total	80

(i) Find the probability that a student obtained less than 50% in the chemistry test.

(ii) Find the probability that a student obtained marks 60 or above.

4. A tyre manufacturing company kept a record of the distance covered before a tyre needed to be replaced. The table shows the results of 800 cases:

Distance (in km)	Frequency
0 − 3000	110
3000 − 5000	120
5000 − 7000	125
7000 − 9000	145
More than 9000	300

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If you buy a tyre of this company, what is the probability that:

(i) it will need to be replaced before it has covered 3000 km?

(ii) it will need to be replaced after it has covered more than 7000 km?

5. The distance (in km) of 20 students from their residence to their school were found as follows

5	3	1	2	2	1	1	2	1	3
1	1	2	2	1	1	3	1	1	2

What is the empirical probability that a student lives:

(i) Less than 2 km from his/her school?

(ii) More than or equal to 2 km from his/her school?

(iii) Within $\frac{1}{2}$ km from his/her school?

6. The weights (in kg) of 20 people were found as follows:

65	60	51	67	54	53	75	60	53	54
49	65	56	58	55	64	67	56	47	50

What is the probability that people's weight is

(i) Less than 70 kg?

(ii) More than or equal to 55 kg?

7. Ten bags of rice, each marked 10 kg, actually contained the following weights of rice (in kg):

10.97	10.05	10.08	10.03	10.00	10.06	10.08	10.98	10.04	10.07

Find the probability that any of these bags chosen at random contains more than 10 kg of rice.

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8. Eight bottles of tomato ketchup, each marked 1 kg, actually contained the following weights of ketchup (in kg):

0.97 1.05 1.03 1.00 1.08 0.98 1.04 1.07

Find the probability that any of these bottles chosen at random contains less than 1 kg of ketchup.