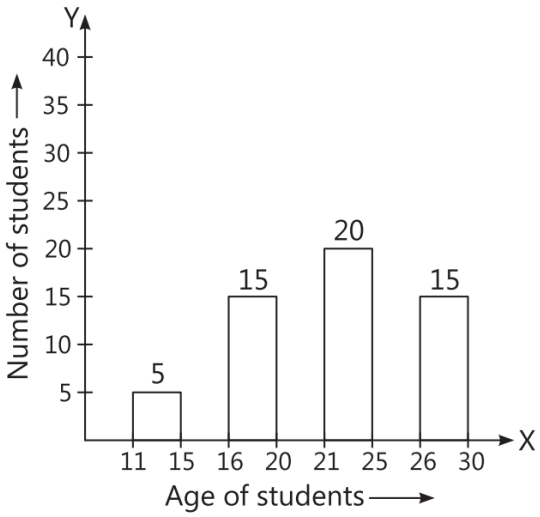
Statistics

Case Study Based Questions

Case Study 1

A teacher is a mentor of students who helps in development of skills, knowledge, temperament and attitude. For that, teacher may work with students as a small group or one to one in a regular interval. The data collected by the teacher of different age groups are shown below:



On the basis of the above information, solve the following questions:

Q1. The data collected by the teacher of different age group is:

a. 30 b. 50

c. 55 d. 40

Q2. The number of students whose age is less than 21 yr is:

a. 18 b. 20

c. 22 d. 24

Q3. The class mark of the interval in which most of students lie in that interval is:

a. 18 b. 22

c. 23 d. 25

Q4. The width of the third class interval is:

a. 5 b. 4

c. 4.5 d. 5.5

Q5. The range of the given data is:

a. 10 b. 14

c. 25 d. 15

Solutions

1. (c) The data collected by the teacher of different age group is 5 + 15 + 20 + 15, i.e., 55

So, option (c) is correct.

2. (b) The number of students whose age is less than 21 yr is 5 + 15 i.e., 20 students.

So, option (b) is correct.

3. (c) From the given bar graph, it is clear that most of the students lie in the age group 21 - 25.

$\therefore$ The class mark of 21-25 is $\frac{21+25}{2}$ *i.e.*, 23

So, option (c) is correct.

4. (b) Third class interval is 21 - 25.

$\therefore$ The width of the class interval is 25 – 21 = 4

So, option (b) is correct.

5. (d) The minimum and maximum values of given data are 5 and 20.

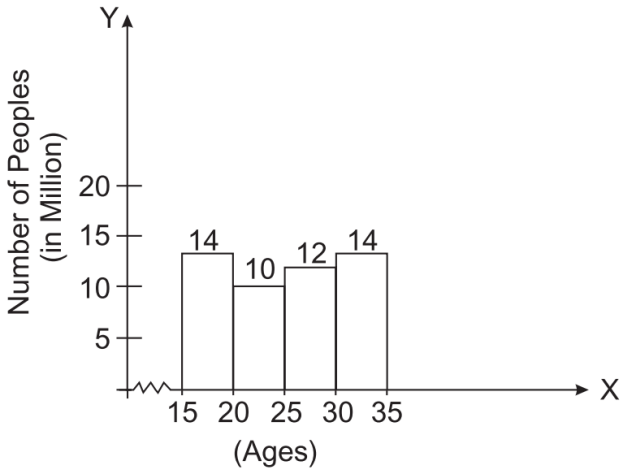
$\therefore$ The range of given data = Maximum value - Minimum value = 20 - 5 = 15

So, option (d) is correct.

Case Study 2

India began its vaccination programmed on 16th January 2021. Within one year a massive population above 18 yr vaccinated upto 80% with double dose and 70% of children from age group 15 to 18 by taking Ist dose. This is all possible in short span of time due to combine efforts of governments and the citizens. The data collected by the government of vaccinated population is shown below.

Ages	15-20	20-25	25-30	30-35
Number of peoples (in million)	14	10	12	14



On the basis of the above information, solve the following questions.

Q1. Upper limit of the fourth class interval is:

a. 30 b. 35

c. 35.5 d. 30.5

Q2. The class mark of 3rd class interval is:

a. 27 b. 27.5

c. 28 d. 28.5

Q3. The number of people having ages more than 25 is (in million):

a. 25 b. 26

c. 24 d. 23

Q4. The number of peoples having maximum ages of 30 is (in million):

a. 36 b. 34

c. 33 d. 38

Q5. In a histogram, the class intervals on the groups are taken along:

a. X-axis b. Y-axis

c. Both a. and b. d. in between X and Y axes

Solutions

1. (b) In given data, the fourth class-interval is 30 - 35.

∴ The upper limit of fourth class-interval 30 - 35 is 35.

So, option (b) is correct.

2. (b) In a given data, the third class is 25 - 30.

$$\therefore \text{ The class mark of 25-30 is } \frac{25+30}{2}$$

$$= \frac{55}{2} = 27.5$$

So, option (b) is correct.

3. (b) The number of peoples having ages more than 25 is

12 + 14 = 26 millions

So, option (b) is correct.

4. (a) The number of peoples having maximum ages of 30 is

14 + 10 + 12 = 36 million

So, option (a) is correct.

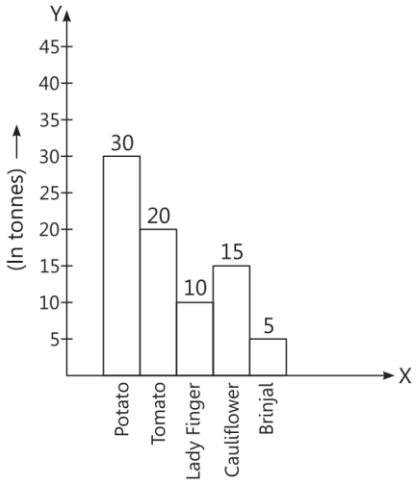
5. (a) In a histogram, the class intervals or the groups are taken along X-axis.

Case Study 3

Department of Agriculture, cooperation and farmers welfare conducted a survey to determine the production of a crop in the year 2021 in the city of Amritsar. The data is given below:

Table-7.4
Foodgrains production **(In '000 MT)**

Crop	2014-15	2015-16	2016-17 Adv. Ext.	2017-18 (Target)	2018-19 (Target)
I. Foodgrains					
Rice	127.38	129.88	146.59	132.00	132.00
Maize	735.96	737.65	784.29	740.00	742.00
Ragi	1.91	1.93	2.12	2.20	2.10
Wheats	648.29	667.62	704.21	670.00	690.00
Rice	36.70	34.33	35.82	36.00	36.00
Gram	0.38	0.38	0.40	0.45	0.45
Pulses	53.87	59.17	67.40	61.00	62.50
Foodgrains	1604.49	1630.96	1740.83	1641.65	1665.05
II. Commercial Crops					
Potato	161.30	103.25	195.84	200.00	195.00
Vegetables	1576.45	1608.55	1633.51	1540.00	1650.00
Chilli(Green)	16.50	32.33	35.39	32.70	35.00



On the basis of the above information, solve the following questions.

Q1. Which crop has maximum production?

Q2. Find the total production of crops.

Q3. What is the percentage of tomato crop in the given production?

Solutions

1. In the given data, it is clear that the maximum production of crop is potato.

2. The total production of crops = 30 + 20 + 10 + 15 + 5 = 80 tonnes

3. ∴ The percentage of tomato crop in given production = 20/80 × 100% = 25%

Case Study 4

National Sample Survey Office (NSSO) conducted a survey on the number of people who get infected in a village at time of monsoon and from what disease they got infected. The data has been given below.

Diseases	**Number of infected people** (in Lakhs)
Malaria	10
Dengue	15
Typhoid	18
Cholera	5
Diarrhoea	7

On the basis of the above information, solve the following questions.

Q1. Find the range of the infected people.

Q2. Which diseases, the maximum people are affected?

Q3. Draw the bar chart from the given data.

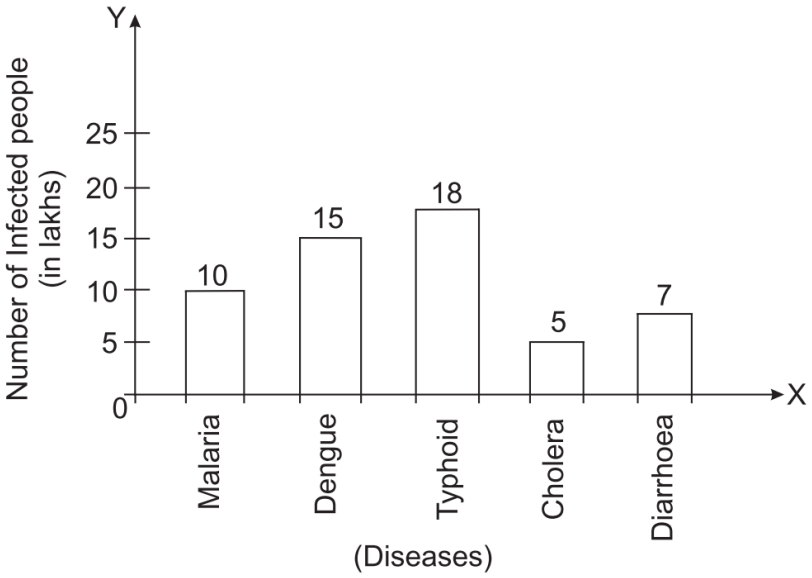
Solutions

1. The minimum value of infected people is 5 and the maximum value of infected people is 18.

∴ Range of infected people 18 - 5 = 13 lakhs.

2. In the given data, it is clear that maximum 18 lakhs people affected by typhoid.

3. The bar chart is shown below:


Y
Number of Infected people
(in lakhs)
25
20
15
10
5
0
10
15
18
5
7
X
Malaria
Dengue
Typhoid
Cholera
Diarrhoea
(Diseases)