Long Answer Type Questions

[4 Marks]

Que 1. The value of π up to 50 decimal places in given below:

3.14159265358979323846264338327950288419716939937510

(i) Make a frequency distribution of the digits from 0 to 9 after the decimal point.

(ii) What are the most and the least frequently occurring digits?

Sol. Frequency distribution of the digits from 0 to 9 after the decimal point in tabular form is given as:

Digits	Tally	Frequency
0	||	2
1	𝍸	5
2	𝍸	5
3	𝍸 |||	8
4	||||	4
5	𝍸	5
6	||||	4
7	||||	4
8	𝍸	5
9	𝍸 |||	8
Total		**50**

(ii) The most frequently occurring digits are 3 and 9. The least occurring is 0.

Que 2. The distance (in km) of 40 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
7	9	7	8	3	5	12	15	18	3
12	14	2	9	6	15	15	7	6	12

Construct a grouped frequency distribution table with class size 5 for the data given above taking the first interval as 0 – 5 (5 not included). What main features do you observe from this tabular representation?

Sol. Frequency distribution of above data in tabular form is given as:

Distances (in km)	**Tally marks**	**Frequency**
0 – 5	𝍸	5
5 – 10	𝍸 𝍸 |	11
10 – 15	𝍸 𝍸 |	11
15 – 20	𝍸 ||||	9
20 – 25	|	1
25 – 30	|	1
30 – 35	||	2
Total		**40**

It is observed that 36 engineers out of 40 live at a distance not more than 20 km from their residence.

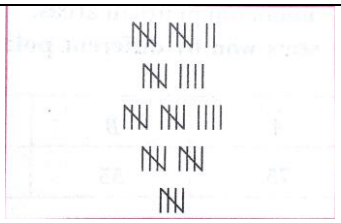
Que 3. The height of 50 students, measured to the nearest centimeter, have been found to be as follows:

161	150	154	165	168	161	154	162	150	151
162	164	171	165	158	154	156	172	160	170
153	159	161	170	162	165	166	168	165	164
154	152	153	156	158	162	160	161	173	166
161	159	162	167	168	159	158	153	154	159

(i) Represent the data given above by a grouped frequency distribution table,

taking the class interval as 160 – 165, 165 – 170, etc.
(ii) What can you conclude about their height from the table?

Sol. (i) Frequency distribution of above data in tabular form is given as:

Height (in cm)	**Tally marks**	**Frequency**
150 – 155 155 – 160 160 – 165 165 – 170 170 – 175		12 9 14 10 5
Total		**50**

(ii) One conclusion we can draw from the above table is that more that 50% of students are shorter than 165 cm.

Que 4. The following data on the number of girls to the nearest ten per thousand boys in different sections of the society is given on next page:

Section of the society	**Number of girls per thousand boys**
Scheduled caste (SC)	940
Scheduled Tribe (ST)	970
Non – SC/ST	920
Backward districts	950
Non – backward districts	920
Rural	930
Urban	910

(i) Represent the above information by a bar graph.
(ii) Write two conclusions you can arrive at from the graph, with justification.

Sol. (i)

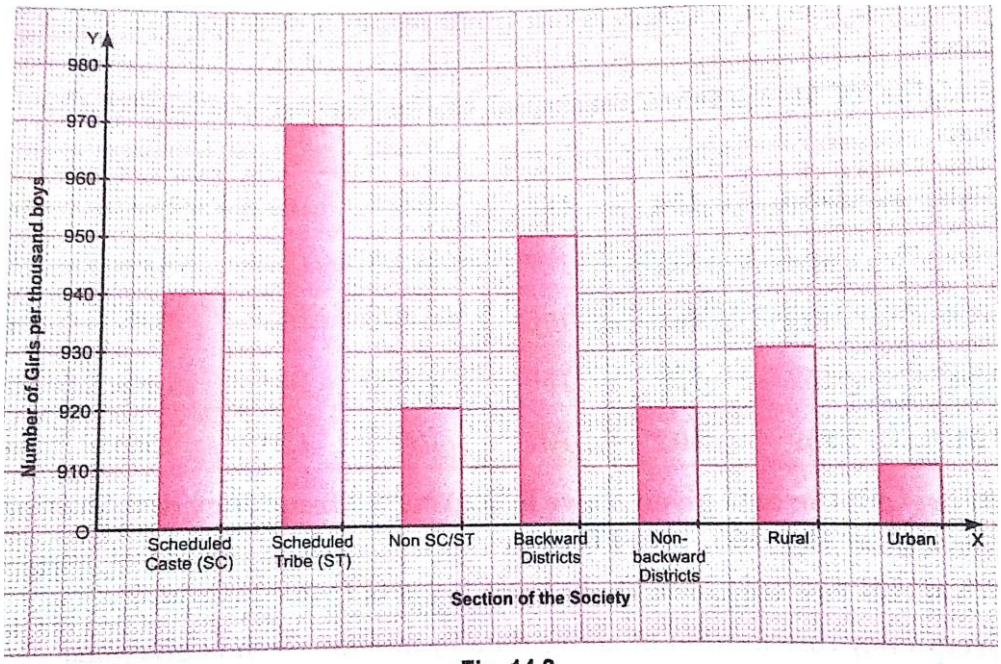


Fig. 14.2

(ii) Number of girls to the nearest ten per thousand boys are maximum in scheduled tribes whereas they are minimum in urban areas.

Que 5. Given below are the seats won by different political parties in the polling outcome of state assembly elections:

Political party	A	B	C	D	E	F
Seats won	75	55	37	29	10	37

(i) Draw a bar graph to represent the polling results.
(ii) Which political party won the maximum number of seats?

Sol. (i)

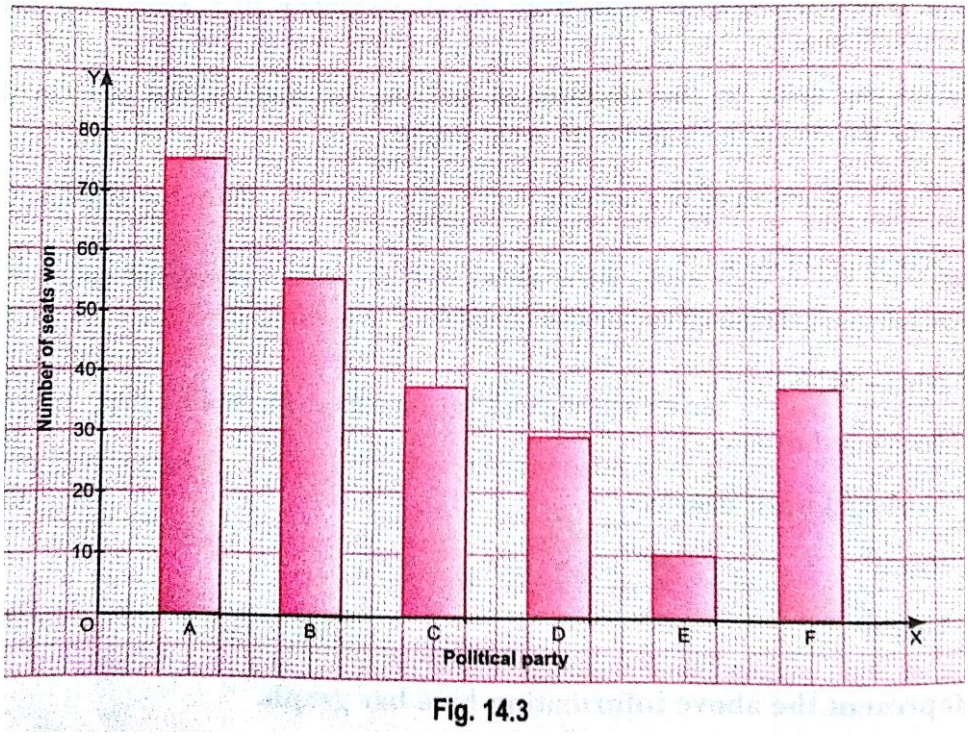


Fig. 14.3

(ii) Party A won the maximum number of seats, i.e., 75.

Que 6. A survey conducted by an organization for the cause of illness and death among the women between the ages 15 – 44 (in years) worldwide found the following figures (in per cent).

S.No.	Causes	Female fatality rate (%)
1.	Reproductive health conditions	31.8
2.	Neuropsychiatric condition	25.4
3.	Injuries	12.4
4.	Cardiovascular conditions	4.3
5.	Respiratory conditions	4.1
6.	Other causes	22.0

(i) Represent the information gives above graphically.
(ii) Which condition is the major cause of women's ill health and death worldwide?

Sol. (i)

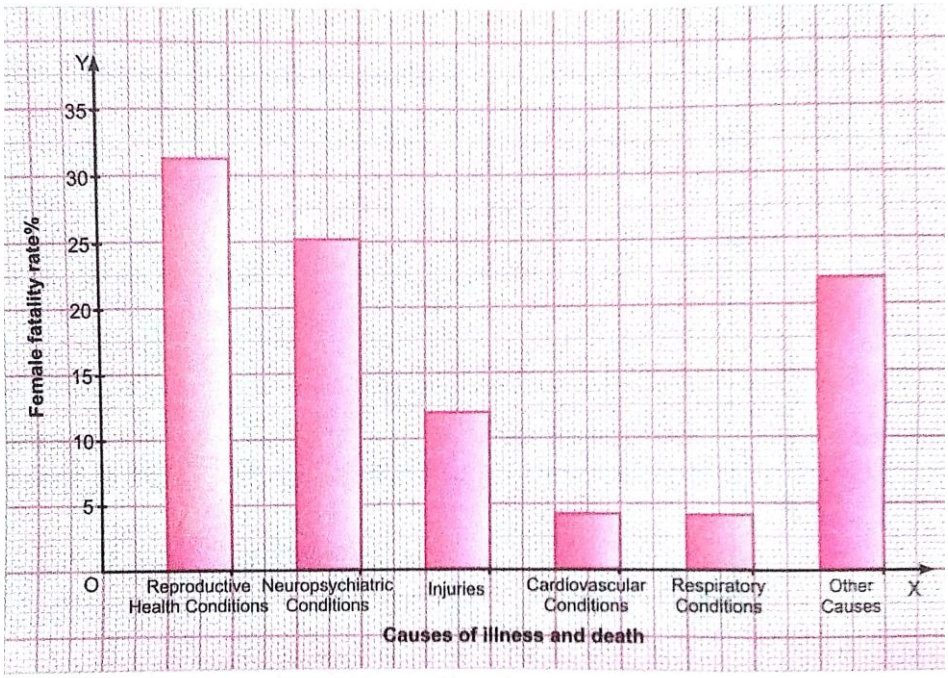


Fig. 14.4

(ii) The major cause of women's ill and death worldwide is reproductive health conditions.

Que 7. The length of 40 leaves of a plant are measured correct to one millimeter, and the obtained data is represented in the following table:

Length (in mm)	188 – 125	127 – 135	136 – 144	145 - 153	154 – 162	163 – 171	172 – 180
Number of leaves	3	5	9	12	5	4	2

(i) Draw a histogram to represent the given data.
(ii) Is there any other suitable graphical representation for the same data?
(iii) Is it correct to conclude that maximum number of leaves are 153 mm long? Why?

Sol. (i) Consider the class 188 – 126 and 127 – 135
The lower limit of 127 – 135 = 127
The upper limit of 118 – 126 = 126

Half of the difference = $\frac{127-126}{2}$ = 0.5

So, the new class interval formed from 188 – 126 is
(118 – 0.5) – (126 + 0.5), i.e., 117.5 – 126.5

(118 – 0.5) – (126 + 0.5), i.e., 117 – 126.5
Continuing in the same manner, the continuous classes formed are:

Length (in mm)	Number of leaves
117.5 – 126.5	3
126.5 – 135.5	5
135.5 – 144.5	9
144.5 – 153.5	12
153.5 – 162.5	5
162.5 – 171.5	4
171.5 – 180.5	2

(ii) Yes, frequency polygon.
(iii) No, this frequency includes all leaves whose length are from 144.5 mm to 153.5 mm.

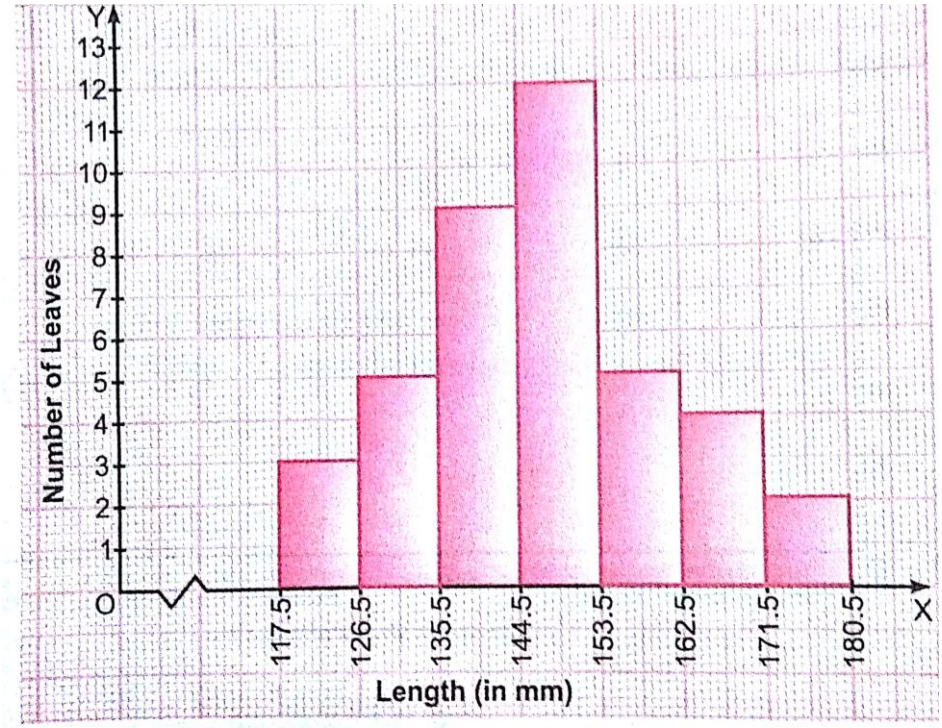


Fig. 14.5

Que 8. The following table gives the life times of 400 neon lamps:

Lifetime (in hours)	Number of lamps
300 – 400	14
400 – 500	56
500 – 600	60
600 – 700	86
700 – 800	74
800 – 900	62
900 – 1000	48

(i) Represent the given information with the help of a histogram and a frequency polygon.
(ii) How many lamps have a lifetime of 700 or more hours?

Sol. (i)

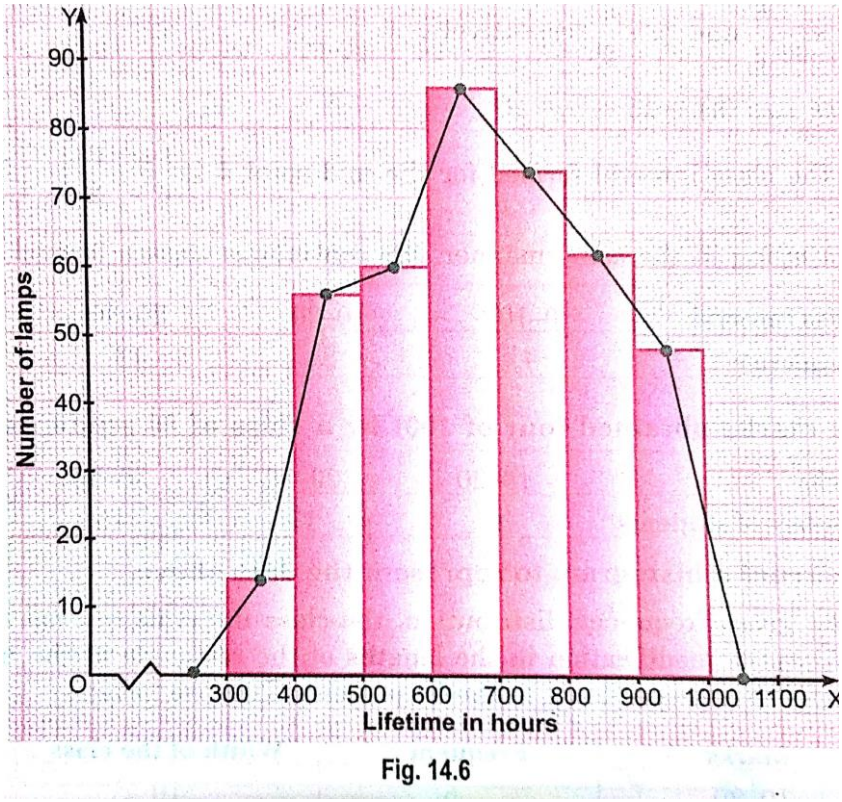


Fig. 14.6

(ii) Number of lamps having life 700 or more hours 74 + 62 + 48 = 184