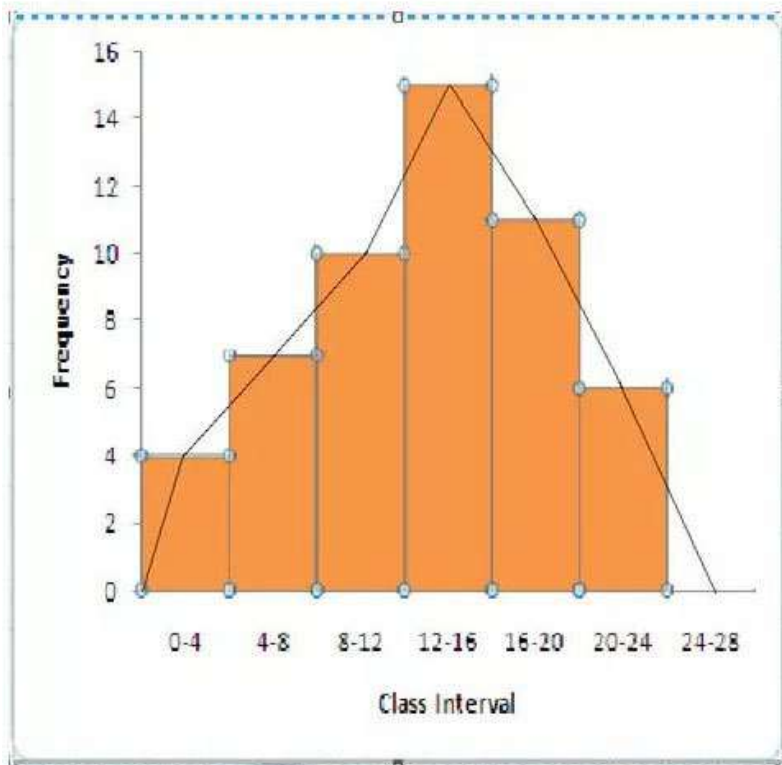


Exercise 18(B)

Solution 1:

The frequency polygon is shown in the following figure



Steps:

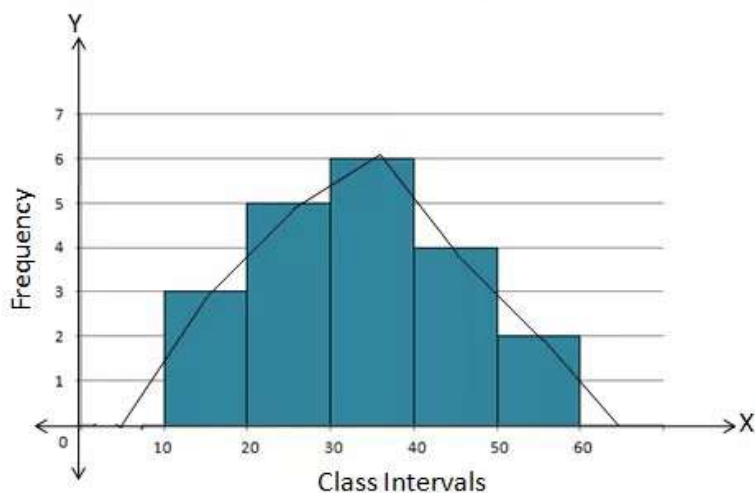
- (i) Drawing a histogram for the given data.
- (ii) Marking the mid-point at the top of each rectangle of the histogram drawn.
- (iii) Also, marking mid-point of the immediately lower class-interval and mid-point of the immediately higher class-interval.
- (iv) Joining the consecutive mid-points marked by straight lines to obtain the required frequency polygon.

Solution 2:

Steps:

- i. Draw a histogram for the given data.
- ii. Mark the mid-point at the top of each rectangle of the histogram drawn.
- iii. Also, mark the mid-point of the immediately lower class-interval and mid-point of the immediately higher class-interval.
- iv. Join the consecutive mid-points marked by straight lines to obtain the required frequency polygon.

The required combined histogram and frequency polygon is shown in the following figure:



Solution 3:

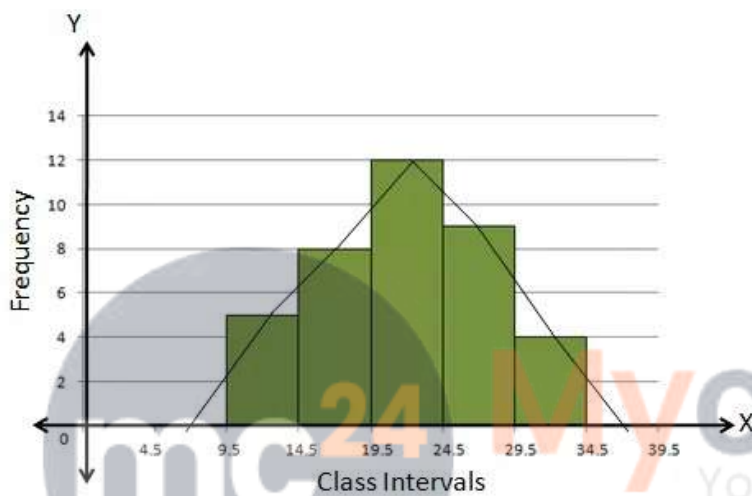
The class intervals are inclusive. We will first convert them into the exclusive form.

Class-Interval	Frequency
9.5 - 14.5	5
14.5 - 19.5	8
19.5 - 24.5	12
24.5 - 29.5	9
29.5 - 34.5	4

Steps:

- Draw a histogram for the given data.
- Mark the mid-point at the top of each rectangle of the histogram drawn.
- Also, mark the mid-point of the immediately lower class-interval and mid-point of the immediately higher class-interval.
- Join the consecutive mid-points marked by straight lines to obtain the required frequency polygon.

The required frequency polygon is as follows:

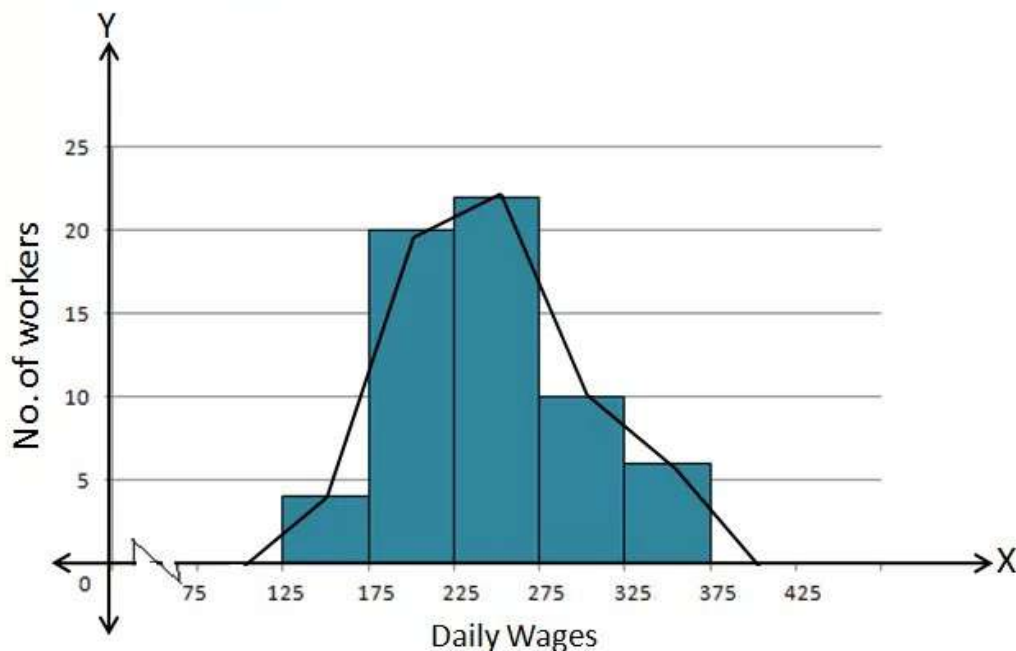


Solution 4:

Steps:

- Draw a histogram for the given data.
- Mark the mid-point at the top of each rectangle of the histogram drawn.
- Also, mark the mid-point of the immediately lower class-interval and mid-point of the immediately higher class-interval.
- Join the consecutive mid-points marked by straight lines to obtain the required frequency polygon.

The required frequency polygon is as follows:



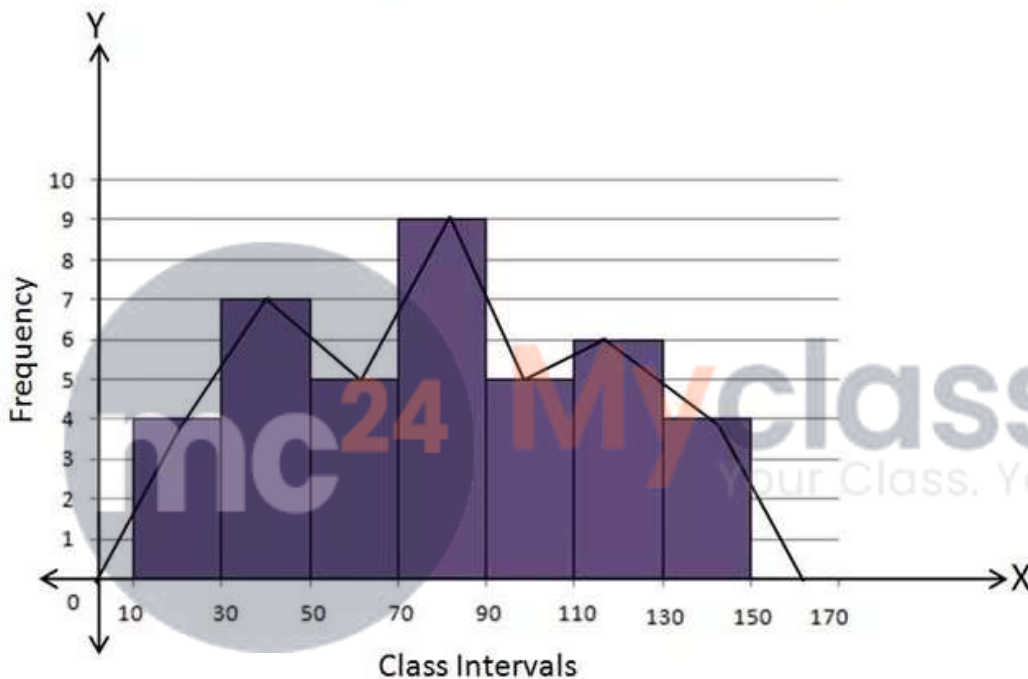
Solution 5(i):

(a) Using Histogram:

C.I.	f
10 - 30	4
30 - 50	7
50 - 70	5
70 - 90	9
90 - 110	5
110 - 130	6
130 - 150	4

Steps:

- Draw a histogram for the given data.
- Mark the mid-point at the top of each rectangle of the histogram drawn.
- Also, mark the mid-point of the immediately lower class-interval and mid-point of the immediately higher class-interval.
- Join the consecutive mid-points marked by straight lines to obtain the required frequency polygon.



(b) Without using Histogram:

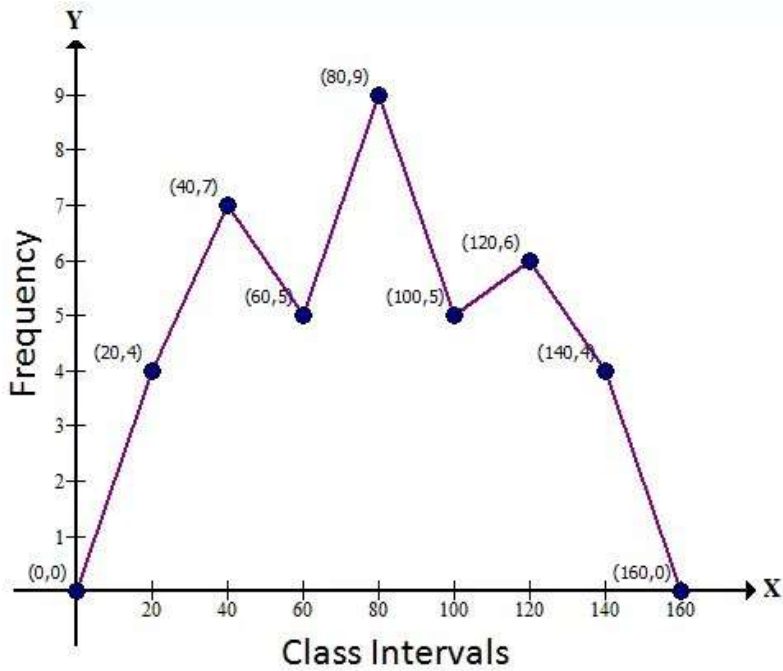
Steps:

- Find the class-mark (mid-value) of each given class-interval.

$$\text{Class-mark} = \text{mid-value} = \frac{\text{Upper limit} + \text{Lower limit}}{2}$$

- On a graph paper, mark class-marks along X-axis and frequencies along Y-axis.
- On this graph paper, mark points taking values of class-marks along X-axis and the values of their corresponding frequencies along Y-axis.
- Draw line segments joining the consecutive points marked in step (3) above.

C.I.	Class-mark	f
-10 - 10	0	0
10 - 30	20	4
30 - 50	40	7
50 - 70	60	5
70 - 90	80	9
90 - 110	100	5
110 - 130	120	6
130 - 150	140	4
150 - 170	160	0



Solution 5(ii):

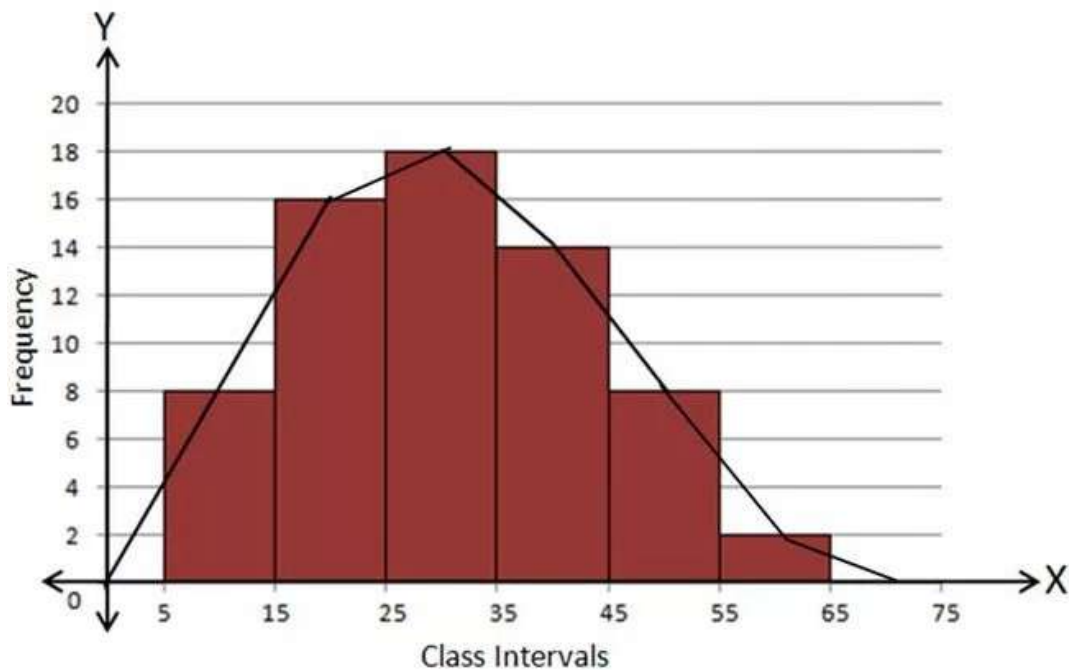
Using Histogram:

C.I.	f
5 - 15	8
15 - 25	16
25 - 35	18
35 - 45	14
45 - 55	8
55 - 65	2



Steps:

- i. Draw a histogram for the given data.
- ii. Mark the mid-point at the top of each rectangle of the histogram drawn.
- iii. Also, mark the mid-point of the immediately lower class-interval and mid-point of the immediately higher class-interval.
- iv. Join the consecutive mid-points marked by straight lines to obtain the required frequency polygon.



Without using Histogram:

Steps:

i. Find the class-mark (mid-value) of each given class-interval.

$$\text{Class - mark} = \text{mid - value} = \frac{\text{Upper limit} + \text{Lower limit}}{2}$$

ii. On a graph paper, mark class-marks along X-axis and frequencies along Y-axis.

iii. On this graph paper, mark points taking values of class-marks along X-axis and the values of their corresponding frequencies along Y-axis.

iv. Draw line segments joining the consecutive points marked in step (3) above.

C.I.	Class-mark	f
-5 - 5	0	0
5 - 15	10	8
15 - 25	20	16
25 - 35	30	18
35 - 45	40	14
45 - 55	50	8
55 - 65	60	2
65 - 75	70	0

