Statistics Ex 7.5 Q4

Answer :

Age (in years)	Group 'A'	Group 'B'
16–18	50	54
18–20	78	89
20–22	46	40
22–24	28	25
24–25	23	17

For **group "A"**

The maximum frequency is 78 so the modal class is 18–20.

Therefore,

$l = 18$

$h = 2$

$f = 78$

$f_1 = 50$

$f_2 = 46$

$$\Rightarrow \text{Mode} = l + \frac{f - f_1}{2f - f_1 - f_2} \times h$$

$$= 18 + \frac{78 - 50}{156 - 50 - 46} \times 2$$

$$= 18 + \frac{28}{\cancel{60}\,^{30}} \times \cancel{2}$$

$$= 18 + \frac{14}{15}$$

$$= 18 + 0.93$$

$$\boxed{\text{Mode} = 18.93}$$

For **group "B"**

The maximum frequency 89 so modal class 18–20.

Therefore,

$l = 18$

$h = 2$

$f = 89$

$f_1 = 54$

$f_2 = 40$

$$\Rightarrow \text{Mode} = 18 + \frac{89 - 54}{178 - 54 - 40} \times 2$$

$$= 18 + \frac{35}{84} \times 2$$

$$= 18 + \frac{\cancel{35}\,^{5}}{\cancel{42}\,_{6}}$$

$$= 18 + \frac{5}{6}$$

$$= 18 + 0.83$$

$$\boxed{\text{Mode} = 18.83}$$

Thus, the modal age of group A is 18.93 years whereas the modal age of group B is 18.83 years.

Statistics Ex 7.5 Q5

Answer :

Marks	0–10	10–20	20–30	30–40	40–50	50–60	60–70	70–80	80–90	90–100
Frequency	3	5	16	12	13	20	5	4	1	1

Here, the maximum frequency is 20 so the modal class is 50–60.

Therefore,

$l = 50$

$h = 10$

$f = 20$

$f_1 = 13$

$f_2 = 5$

Now,

$$\text{Mode} = l + \frac{f - f_1}{2f - f_1 - f_2} \times h$$

$$= 50 + \frac{20 - 13}{40 - 13 - 5} \times 10$$

$$= 50 + \frac{7}{22} \times 10$$

$$= 50 + \frac{70}{22}$$

$$= 50 + 3.17$$

$$\boxed{\text{Mode} = 53.17}$$

Thus, the mode of the marks obtained by the students in science is 53.17.

********** END *********