Statistics Ex 7.4 Q18

Answer :

We prepare the cumulative frequency table, as given below.

litetime(in hours)	No. of lamps:	cumulative frequency $(c.f.)$
$1500-2000$	14	14
$2000-2500$	56	70
$2500-3000$	60	130
$3000-3500$	86	216
$3500-4000$	74	290
$4000-4500$	62	352
$4500-5000$	48	400
	N=400	

We have, $N=400$

So, $\frac{N}{2}=200$

Now, the cumulative frequency just greater than 200 is 216 and the corresponding class is $3000-3500$.

Therefore, $3000-3500$ is the median class.

Here, $l=3000, f=86, F=130$ and $h=500$

We know that

$$\text{Median}=l+\left\{\frac{\frac{N}{2}-F}{f}\right\}\times h$$

$$=3000+\left\{\frac{200-130}{86}\right\}\times 500$$

$$=3000+\frac{70\times 500}{86}$$

$$=3000+\frac{35000}{86}$$

$$=3000+406.98$$

$$=3406.98$$

Hence, the median life of the lamps is approximately 3406.98 hours.

Statistics Ex 7.4 Q19

Answer :

We prepare the cumulative frequency table, as given below.

weight (in kg):	No. of students: (f_i)	cumulative frequency $(c.f.)$
40-45	2	2
$45-50$	3	5
$50-55$	8	13
$55-60$	6	19
$60-65$	6	25
$65-70$	3	28
$70-75$	2	30
	$N=30$	

We have, $N=30$

So, $\frac{N}{2}=15$

Now, the cumulative frequency just greater than 15 is 19 and the corresponding class is $55-60$.

Therefore, $55-60$ is the median class.

Here, $l=55, f=6, F=13 \text{ and } h=5$

We know that

$$\text{Median} = l+\left\{\frac{\frac{N}{2}-F}{f}\right\}\times h$$

$$=55+\left\{\frac{15-13}{6}\right\}\times 5$$

$$=55+\frac{2\times 5}{6}$$

$$=55+\frac{10}{6}$$

$$=55+1.667$$

$$=56.667$$

Hence, the median weight of students is 56.67 kg.

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