

QB365 QUESTION BANK SOFTWARE

10th Maths Important Case Study Questions for Statistics 2024

SECTION A

2 x 4 = 8

1) An agency has decided to install customised playground equipments at various colony parks. For that they decided to study the age-group of children playing in a park of the particular colony. The classification of children according to their ages, playing in a park is shown in the following table

Age group of children (in years)	6-8	8-10	10-12	12-14	14-16
Number of children	43	58	70	42	27



Based on the above information, answer the following questions.

(i) The maximum number of children are of the age-group

(a) 12-14 (b) 10-12 (c) 14-16 (d) 8-10

(ii) The lower limit of the modal class is

(a) 10 (b) 12 (c) 14 (d) 8

(iii) Frequency of the class succeeding the modal class is

(a) 58 (b) 70 (c) 42 (d) 27

(iv) The mode of the ages of children playing in the park is

(a) 9 (b) 8 (c) 11.5 (d) 10.6

years years years years

(v) If mean and mode of the ages of children playing in the park are same, then median will be equal to

(a) Mean (b) Mode

(c) Both (a) and (d) Neither (a) nor

(b) (b)

Answer : (i) (b): Since, the highest frequency is 70, therefore the maximum number of children are of the age-group 10-12.

(ii) (a): Since, the modal class is 10-12

\therefore Lower limit of modal class = 10

(iii) (c) : Here, $f_0 = 58, f_1 = 70$ and $f_2 = 42$

Thus, the frequency of the class succeeding the modal class is 42.

(iv) (d): Mode = $l + \left[\frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right] \times h$

$$= 10 + \left[\frac{70 - 58}{140 - 58 - 42} \right] \times 2$$

$$= 10 + \frac{12}{40} \times 2 = 10 + \frac{24}{40} = 10.6 \text{ years}$$

(v) (c): Given that, Mean = Mode

\therefore By Empirical relation, we have

$$\text{Mode} = 3 \text{ Median} - 2 \text{ Mean}$$

$$\Rightarrow \text{Mode} = 3 \text{ Median} - 2 \text{ Mode}$$

$$\Rightarrow 3 \text{ Mode} = 3 \text{ Median}$$

$$\Rightarrow \text{Median} = \text{Mode} = \text{Mean}$$

2) A group of students went to another city to collect the data of monthly consumptions (in units) to complete their Statistics project. They prepare the following frequency distribution table from the collected data gives the monthly consumers of a locality.

Monthly consumption (in units)	No. of consumers
65 - 85	4
85 - 105	5

105 - 125	13
125 - 145	20
145 - 165	14
165 - 185	8
185 - 205	4



- (i) What is the lower limit of median class?
(a) 125 (b) 145 (c) 165 (d) 185
- (ii) What is the lower limit of modal class?
(a) 125 (b) 145 (c) 165 (d) 185
- (iii) What is the mean of upper limits of median and modal class?
(a) 125 (b) 145 (c) 165 (d) 185
- (iv) What is the width of the class?
(a) 10 (b) 15 (c) 20 (d) 25
- (v) The median is :
(a) 137 (b) 135 (c) 125 (d) 135.7

Answer : (i) (a):

Monthly consumption (in units)	No. of consumers (f_i)	cumulative frequency
65 - 85	4	4
85 - 105	5	9
105 - 125	13	22
125 - 145	20	42
145 - 165	14	56
165 - 185	8	64
185 - 205	4	68
Total	$\Sigma f_i = n = 68$	

Here, $\Sigma f_i = n = 68$ then $\frac{n}{2} = \frac{68}{2} = 34$ which lies in interval 125 - 145
= 125

(ii) (a): 125

(iii) (b): 145

(iv) (c): 20

(v) (a): Median class = 125 - 145

So, $l = 125$; $n = 68$; $f = 20$; $cf = 22$ and $h = 20$

Using formula, Median = $l + \left[\frac{\frac{n}{2} - cf}{f} \right] \times h$

$$= 125 + \left\{ \frac{\frac{68}{2} - 22}{20} \right\} \times 20$$

$$= 125 + \frac{34 - 22}{20} \times 20 = 125 + 12$$

$$= 137$$