

STATISTICS (Q 7, PAPER 2)

LESSON NO. 2: FREQUENCY DISTRIBUTIONS

2007

7 (c) The age of each person living in one street was recorded during a census. The information is summarised in the following table:

Age (in years)	0 – 20	20 – 30	30 – 50	50 – 80
Number of people	16	12	32	12

- (i) How many people were living in the street?
- (ii) Using mid-interval values, calculate the mean age.
- (iii) What is the greatest number of people who could have been aged under 40 years?

SOLUTION

Draw up a frequency table using the mid-interval values. To get a mid-interval value add the two numbers together and divide by 2.

Ex. Class interval: 50 – 80

Mid-interval value: $\frac{50+80}{2} = 65$

x	f	fx
10	16	160
25	12	300
40	32	1280
65	12	780
	72	2520

7 (c) (i)

Number of people (frequency) = $16 + 12 + 32 + 12 = 72$

7 (c) (ii)

$$\bar{x} = \frac{f_1x_1 + f_2x_2 + \dots + f_Nx_N}{f_1 + f_2 + \dots + f_N} = \frac{\sum fx}{\sum f} \dots \textcircled{2}$$

Mean age: $\bar{x} = \frac{\sum fx}{\sum f} = \frac{2520}{72} = 35$

7 (c) (iii)

Those people in the 30 – 50 age group can be any age from 30 up to 50 years of age. In the greatest number situation, all the people in this group could be under 40. Therefore, the greatest number of people under 40 is:

$16 + 12 + 32 = 60$

1997

7 (a) The table shows the distribution of ages of a group of 100 people.

Age (in years)	0 – 10	10 – 20	20 – 30	30 – 50	50 – 80
Number of people	10	19	25	30	16

[Note that 10 – 20 means that 10 is included but 20 is not, etc.]

Taking 5, 15, etc. as mid-interval values, estimate the mean age of the people in the group.

SOLUTION

Draw up a frequency table using the mid-interval values. To get a mid-interval value add the two numbers together and divide by 2.

Ex. Class interval: 30 – 50

Mid-interval value: $\frac{30 + 50}{2} = 40$

$$\bar{x} = \frac{f_1x_1 + f_2x_2 + \dots + f_Nx_N}{f_1 + f_2 + \dots + f_N} = \frac{\sum fx}{\sum f} \dots \textcircled{2}$$

x	f	fx
5	10	50
15	19	285
25	25	625
40	30	1200
65	16	1040
	100	3200

Mean price: $\bar{x} = \frac{\sum fx}{\sum f} = \frac{3200}{100} = 32$