

NCERT SOLUTIONS

CLASS - 11th



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Class : 11th

Subject : Statistics

Chapter : 3

Chapter Name : Organisation of Data

Q1 Which of the following alternatives is true?

(i) The class midpoint is equal to:

- (a) The average of the upper class limit and the lower class limit.
- (b) The product of upper class limit and the lower class limit.
- (c) The ratio of the upper class limit and the lower class limit.
- (d) None of the above.

(ii) The frequency distribution of two variables is known as

- (a) Univariate Distribution
- (b) Bivariate Distribution
- (c) Multivariate Distribution
- (d) None of the above

(iii) Statistical calculations in classified data are based on

- (a) the actual values of observations
- (b) the upper class limits
- (c) the lower class limits
- (d) the class midpoints

(iv) Range is the

- (a) difference between the largest and the smallest observations
- (b) difference between the smallest and the largest observations
- (c) average of the largest and the smallest observations
- (d) ratio of the largest to the smallest observation

Answer.

(i) Option (a) is the correct answer.

Class Midpoint is given as $(\text{Upper Class Limit} + \text{Lower Class Limit})/2$.

(ii) Option (b) is the correct answer.

Since there are only two variables, the frequency distribution is called a bivariate distribution.

(iii) Option (d) is the correct answer.

Since the actual values in a range are difficult to determine accurately, the class midpoints are calculated to give a fairly accurate result.

(iv) Option (a) is the correct answer.

Range is given by (Largest value – Smallest value).

Note: Option (b) seems to be the correct answer too, because the difference is taken without any algebraic expressions. However, on the safe side option (a) will be accepted.

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Q2 Can there be any advantage in classifying things? Explain with an example from your daily life.

Answer. Yes. These are the following advantages in classifying things :

- 1. Easy Interpretation – The data can be interpreted very easily if it is classified rather than scattered.
- 2. Less Time Consuming – The data, if classified takes lesser time to analyse and derive conclusions.
- 3. Visualisation of Relation – The data when classified is easy to visualise and certain relations between the data can be derived by a simple look at the data.

For example, a chemist has to deal with a lot of medicines everyday. Therefore, he sorts the medicines alphabetically to find them easily.

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Q3 What is a variable? Distinguish between a discrete and a continuous variable.

Answer. A variable is a quantity that can take multiple values from a range of values, one at a time. It is of two types — discrete and continuous.

	Discrete Variable	Continuous Variable
1.	It takes values only in whole numbers.	It takes values from a range, and can be fractional.

2.	The increase in values is in the form of jumps.	The increase can be fractional or in whole numbers, but no jump occurs.
3.	Example: Number of people that can be accommodated in a bus	Example: Age of the students of a class

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Q4 Explain the ‘exclusive’ and ‘inclusive’ methods used in classification of data.

Answer. In the exclusive method of classification of data, the values are taken from the lower limit of the class interval but the upper limit is excluded. The upper limit of one class interval becomes the lower limit of the succeeding class interval. For example, class intervals as 0-5, 5-10, 10-15, etc. are exclusive.

In the inclusive method, both the upper limit as well as the lower limit of the class interval is taken into consideration. The values of class intervals do not overlap in this case. For example, class intervals such as 0-4, 5-9, 10-14, etc. are inclusive.

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Q5 Use the data in Table 3.2 that relate to monthly household expenditure (in Rs) on food of 50 households and

(i) Obtain the range of monthly household expenditure on food.

Table 3.2

Monthly Household Expenditure (in Rupees) on Food of 50 Households				
1904	1559	3473	1735	2760
2041	1612	1753	1855	4439
5090	1085	1823	2346	1523
1211	1360	1110	2152	1183
1218	1315	1105	2628	2712
4248	1812	1264	1183	1171
1007	1180	1953	1137	2048
2025	1583	1324	2621	3676
1397	1832	1962	2177	2575
1293	1365	1146	3222	1396

(ii) Divide the range into appropriate number of class intervals and obtain

the frequency distribution of expenditure.

- (iii) Find the number of households whose monthly expenditure on food is
- (a) less than Rs 2000
 - (b) more than Rs 3000
 - (c) between Rs 1500 and Rs 2500

Answer.

(i) Range = Highest Value – Lowest Value

= 5090 – 1007

= 4083

(ii) The Frequency Distribution is given below:

Monthly Household Expenditure Class Intervals	Tally Bars	Frequency Distribution of Expenditure
1000-1500	THL THL THL THL	20
1500-2000	THL THL III	13
2000-2500	THL THL III	06
2500-3000	THL I	05
3000-3500	THL	02
3500-4000	II	01
4000-4500	I	02
4500-5000	-	00
5000-5500	I	01
		50

- (iii) (a) The number of households whose monthly expenditure on food is less than Rs 2000 = 33

- (iii) (b) The number of households whose monthly expenditure on food is more than Rs 3000 = 6
- (iii) (c) The number of households whose monthly expenditure on food is between Rs 1500 and Rs 2500 = 19

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Q6 In a city 45 families were surveyed for the number of Cell phones they used. Prepare a frequency array based on their replies as recorded below.

1 3 2 2 2 2 1 2 1 2 2 3 3 3 3
3 3 2 3 2 2 6 1 6 2 1 5 1 5 3
2 4 2 7 4 2 4 3 4 2 0 3 1 4 3

Answer. The frequency array of the given data is as follows:

Number of Domestic Appliances	Number of Households
0	1
1	7
2	15
3	12
4	5
5	2
6	2
7	1
Total	45

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Q7 What is ‘loss of information’ in classified data?

Answer. The loss of information in a classified data means that the actual values are lost when the data is classified into a compact volume. The observations lose their

individuality and assume the value equal to the average of the class size, i.e. class midpoint. Therefore, the data is not available for study. Only their frequency is studied in case of classified data.

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Q8 Do you agree that classified data is better than raw data? Why?

Answer. Yes, despite some drawbacks, classified data is better than raw data due to the following reasons:

- 1. Classified data is easy to analyse.
- 2. Classified data saves time and hence a comprehensive study can be performed in a short time.
- 3. Classified data is easy to pass on, so that others may understand what has been interpreted and concluded after the analysis.

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Q9 Distinguish between univariate and bivariate frequency distribution.

Answer. In a univariate frequency distribution, there is only one variable whose frequency distribution is studied. For example, the money spent by a person in a day on various things.

In a bivariate frequency distribution, there are two variables whose frequency distribution is studied. For example, height and weight comparison of the students in a class.

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Q10 Prepare a frequency distribution by inclusive method taking class interval of 7 from the following data.

28	17	15	22	29	21	23	27	18	12	7	2	9	4
1	8	3	10	5	20	16	12	8	4	33	27	21	15
3	36	27	18	9	2	4	6	32	31	29	18	14	13
15	11	9	7	1	5	37	32	28	26	24	20	19	25
19	20	6	9										

Answer. The Frequency distribution table is given below:

Class Interval	Tally marks	Frequency
0 – 7		15
8 – 15		15
16 – 23		14
24 – 31		11
32 – 39		5
Total		60

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Q11 “The quick brown fox jumps over the lazy dog”
Examine the above sentence carefully and note the numbers of letters in each word. Treating the number of letters as a variable, prepare a frequency array for this data.

Answer. The frequency distribution table is given below :

Number of Letters	Tally Marks	Frequency
1	—	0
2	—	0
3		4
4		2

5	III	3
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