Statistics

Standard difficulty · 20 questions · 40 marks · Time: 41 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. The class mark of the class 40–44 is:

(a) 46 **(b)** 44 **(c)** 4 **(d)** 42

2. The mean of 80, 72, 85, 66, 40, 10, 88 is:

(a) 55.13 **(b)** 65 **(c)** 441 **(d)** 63

3. For the data below, the modal class is:
Class: 15–20, 20–25, 25–30, 30–35, 35–40
Frequency: 17, 12, 8, 14, 10

(a) 15–20 **(b)** 30–35 **(c)** 20–25 **(d)** 25–30

4. For the data below, the median class is:
Class: 80–100, 100–120, 120–140, 140–160, 160–180
Frequency: 12, 4, 19, 19, 11

(a) 140–160 **(b)** 120–140 **(c)** 80–100 **(d)** 100–120

5. The class mark of the class 10–20 is:

(a) 30 **(b)** 10 **(c)** 15 **(d)** 20

6. For a distribution, the mean is 43 and the median is 44. Using the empirical relation, the mode is about:

(a) 41 **(b)** 45 **(c)** 46 **(d)** 87

7. Using the assumed mean method with a = 110, $\Sigma f_i = 55$ and $\Sigma f_i d_i = 105$, the mean is:

(a) 112.91 **(b)** 1.91 **(c)** 108.09 **(d)** 111.91

8. Assertion (A): For the data below, the modal class is 50–60.
Class: 40–50, 50–60, 60–70, 70–80, 80–90, 90–100
Frequency: 15, 20, 17, 18, 18, 2
Reason (R): The class mark is the mid-point of a class.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Section B — Short answer — 8 × 2 = 16 marks

9. Find the mean of this data. (Give your answer to 2 decimal places where needed.)
Class: 0–5, 5–10, 10–15, 15–20, 20–25
Frequency: 15, 17, 6, 17, 9

10. Find the mode of this data. (Give your answer to 2 decimal places where needed.)
Class: 80–100, 100–120, 120–140, 140–160, 160–180, 180–200
Frequency: 14, 15, 8, 11, 10, 2

11. Find the median of this data. (Give your answer to 2 decimal places where needed.)
Class: 5–10, 10–15, 15–20, 20–25, 25–30, 30–35
Frequency: 18, 17, 13, 8, 10, 17

12. The mean of this data is 28.75. Find the missing frequency p.
Class: 0–10, 10–20, 20–30, 30–40, 40–50
Frequency: 7, p, 19, 3, 16

13. Write the 'less than' cumulative frequency table for this data.
Class: 0–10, 10–20, 20–30, 30–40, 40–50
Frequency: 18, 8, 18, 6, 7

14. Find the median of 59, 44, 64, 78, 63, 20, 59, 49.

15. Find the mode of 33, 42, 21, 21, 22, 40, 27, 21.

16. The mean of 8 numbers is 27. If one number, 77, is removed, find the mean of the remaining numbers. (Give your answer to 2 decimal places where needed.)

Section C — Word problems — 4 × 4 = 16 marks

17. The marks of students in a test are shown below. Find the mean mark. (Give your answer to 2 decimal places where needed.)
Marks: 40–60, 60–80, 80–100, 100–120, 120–140
Number of students: 8, 9, 2, 4, 16

18. The daily wages (in Rs) of workers in a factory are shown below. Find the median wage. (Give your answer to 2 decimal places where needed.)
Daily wage (Rs): 180–200, 200–220, 220–240, 240–260, 260–280, 280–300
Number of workers: 19, 7, 2, 13, 7, 13

19. The ages (in years) of patients admitted to a hospital in a month are shown below. Find the mode. (Give your answer to 2 decimal places where needed.)
Age (years): 15–35, 35–55, 55–75, 75–95, 95–115
Number of patients: 5, 10, 19, 20, 8

20. A survey counted the plants in each house of a locality. Find the mean number of plants per house. (Give your answer to 2 decimal places where needed.)
Number of plants: 0–2, 2–4, 4–6, 6–8, 8–10, 10–12
Number of houses: 18, 5, 4, 9, 4, 14

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Answer key

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Q	Answer	Working
1	**(d) 42**	(40 + 44) ÷ 2 = 42
2	**(d) 63**	441 ÷ 7 = 63
3	**(a) 15–20**	the highest frequency is 17
4	**(b) 120–140**	n = 65, n/2 = 32.5; cumulative frequencies 12, 16, 35, 54, 65
5	**(c) 15**	(10 + 20) ÷ 2
6	**(c) 46**	Mode = 3 Median − 2 Mean = 132 − 86
7	**(d) 111.91**	110 + (105 ÷ 55) = 111.91
8	**(b) Both A and R are true, but R is not the correct explanation of A.**	A is true: the highest frequency, 20, is in 50–60. R is true but does not explain A.
9	**11.56**	class marks 2.5, 7.5, 12.5, 17.5, 22.5; $\Sigma f_i x_i = 740$, $\Sigma f_i = 64$
10	**102.5**	modal class 100–120: l = 100, $f_1 = 15$, $f_0 = 14$, $f_2 = 8$, h = 20
11	**17.5**	n/2 = 41.5; median class 15–20: l = 15, cf = 35, f = 13, h = 5
12	**p = 3**	($\Sigma f_i x_i$ of the known classes + 15p) ÷ (45 + p) = 28.75
13	**less than 10: 18; less than 20: 26; less than 30: 44; less than 40: 50; less than 50: 57**	add the frequencies one class at a time
14	**59**	in order: 20, 44, 49, 59, 59, 63, 64, 78; the mean of the two middle values
15	**21**	21 occurs 3 times, more than any other value
16	**19.86**	total = 8 × 27 = 216; (216 − 77) ÷ 7 = 19.86
17	**95.64**	$\Sigma f_i x_i \div \Sigma f_i = 3730 \div 39$
18	**Rs 243.85**	median = l + ((n/2 − cf) ÷ f) × h
19	**76.54 years**	mode = $l + ((f_1 - f_0) \div (2f_1 - f_0 - f_2)) \times h$
20	**5.67**	class marks 1, 3, 5, 7, 9, 11; $\Sigma f_i x_i \div \Sigma f_i = 306 \div 54$

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