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Dept. of Mathematics 2025 – 2026
Class XI – Mathematics
Work Sheet – Statistics



1	Mean of first n natural numbers is (a) $\frac{n}{2}$ (b) n (c) $\frac{n+1}{2}$ (d) $\frac{2n+1}{2}$
2	The standard deviation of the data 6, 5, 9, 13, 12, 8, 10 is (a) $\sqrt{\frac{52}{7}}$ (b) $\frac{52}{7}$ (c) $\sqrt{6}$ (d) 6
3	The mean deviation of the data 3, 10, 10, 4, 7, 10, 5 from the mean (a) 2 (b) 2.57 (c) 3 (d) 3.57
4	If $\bar{x}$ is the mean of n observations $x_1, x_2, x_3, \dots, x_n$, then $\frac{1}{n} \sum x_i - \bar{x} $ is equal to (a) M.D. about $\bar{x}$ (b) S.D. (c) 0 (d) variance
5	The following are the measures of 9 students in Mathematics test: 50, 69, 33, 53, 39, 40, 65, 59 The mean deviation from the median is (a) 9 (b) 10.5 (c) 12.67 (d) 14.76
6	If $\bar{x}$ is the mean of observations $x_1, x_2, x_3, \dots, x_n$, then the mean of $2x_1 + 3, 2x_2 + 2, 2x_3 + 3, \dots, 2x_n + 3$ is (a) $3\bar{x} + 2$ (b) $2\bar{x} + 3$ (c) $2\bar{x}$ (d) $3\bar{x}$ (e) $3\bar{x} + 5$
7	When tested, the lives (in hours) of bulbs were noted as follows: 1357, 1090, 1666, 1494, 1623 The mean deviation (in hours) from their mean is (a) 178 (b) 179 (c) 220 (d) 356 (e) 253
8	S.D. of first natural numbers is (a) $\frac{n+1}{2}$ (b) $\sqrt{\frac{n^2-1}{12}}$ (c) $\frac{n^2-1}{12}$ (d) $\frac{2n+1}{2}$
9	Variance of observations $x_1, x_2, x_3, \dots, x_n$ is given by (a) $\frac{\sum x_i^2}{n}$ (b) $\frac{\sum x_i^2}{n} - \left(\frac{\sum x_i}{n}\right)^2$ (c) $\sqrt{\frac{\sum x_i^2}{n} - \left(\frac{\sum x_i}{n}\right)^2}$ (d) $\frac{\sum x_i }{n}$

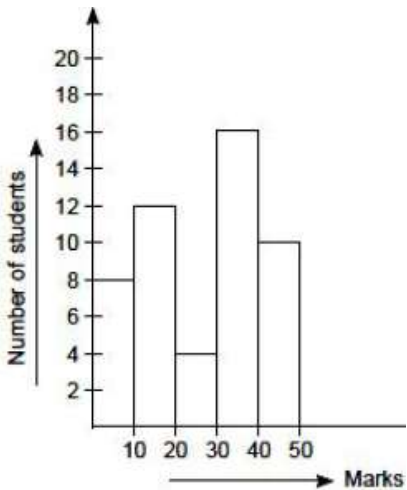
10	The median of the data 11, 29, 17, 21, 13, 31, 39, 19 is (a) 20 (b) 19 (c) 21 (d) 29
11	If S.D. of n observations $x_1, x_2, x_3, \dots, x_n$ is σ , then the S.D. of $\lambda x_1, \lambda x_2, \lambda x_3, \dots, \lambda x_n$ is (a) $\lambda\sigma$ (b) σ (c) $ \lambda \sigma$ (d) $n\sigma$
12	The mean of 100 observations is 50 and their standard deviation is 5. The sum of squares of all observations is (a) 50000 (b) 250000 (c) 252500 (d) 255000
13	For the following raw data: 3, 9, 5, 3, 12, 10, 18, 4, 7, 19, 21 the mean deviation about median is (a) 5.12 (b) 4.57 (c) 5.87 (d) 5.27
14	In a cricket season, the player A scores on average of 50 runs with a standard deviation of 15 runs, the coefficient of variance of the player is given by (a) 25 (b) 28 (c) 30 (d) 35
15	The variance of the data 2, 4, 6, 8, 10 is (a) 4 (b) 6 (c) 7 (d) 8
16	The mean deviation of natural numbers less than 8 is (a) 1.2 (b) 1.3 (c) 1.5 (d) 1.7
17	The standard deviation of the first 10 natural numbers is (a) 5.5 (b) 3.87 (c) 2.87 (d) 2

For Q18 and Q19, a statement of assertion (A) is followed by a statement of reason (R). Choose the correct answer out of the following choices.

- (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.

18	Assertion (A): Mean deviation about the median of the observations 38, 70, 48, 34, 63, 42, 55, 44, 53, 47 is 8.4. Reason (R): $MD(\text{Median}) = \frac{\sum x_i - \text{Median} }{n}$
19	Assertion (A): The weights (in kg) of 5 students are as follows 31, 35, 27, 29, 32, 43, 37, 41, 34, 28, 36, 44, 45, 42, 30. If the weight 44 kg is replaced by 46 kg and 27 kg is by 25 kg, then the new median is 35. Reason (R): The mean deviation from the median of the weights (in kg) 54, 50, 40, 42, 51, 45, 45, 57 is 4.78.

20	Calculate mean, variance and standard deviation for the following data:																		
	<table><tr><td>Class</td><td>30–40</td><td>40–50</td><td>50–60</td><td>60–70</td><td>70–80</td><td>80–90</td><td>90–100</td></tr><tr><td>Frequency</td><td>3</td><td>7</td><td>12</td><td>15</td><td>8</td><td>3</td><td>2</td></tr></table>	Class	30–40	40–50	50–60	60–70	70–80	80–90	90–100	Frequency	3	7	12	15	8	3	2		
Class	30–40	40–50	50–60	60–70	70–80	80–90	90–100												
Frequency	3	7	12	15	8	3	2												
21	Find the mean and standard deviation for the following data:																		
	<table><tr><td>Wages up to (in ₹)</td><td>15</td><td>30</td><td>45</td><td>60</td><td>75</td><td>90</td><td>105</td><td>120</td></tr><tr><td>No. of workers</td><td>12</td><td>30</td><td>65</td><td>107</td><td>157</td><td>202</td><td>222</td><td>230</td></tr></table>	Wages up to (in ₹)	15	30	45	60	75	90	105	120	No. of workers	12	30	65	107	157	202	222	230
Wages up to (in ₹)	15	30	45	60	75	90	105	120											
No. of workers	12	30	65	107	157	202	222	230											
22	Find the mean and standard deviation for the following distribution:																		
	<table><tr><td>x</td><td>0–30</td><td>30–60</td><td>60–90</td><td>90–120</td><td>120–150</td><td>150–180</td><td>180–210</td></tr><tr><td>f</td><td>9</td><td>17</td><td>43</td><td>82</td><td>81</td><td>44</td><td>24</td></tr></table>	x	0–30	30–60	60–90	90–120	120–150	150–180	180–210	f	9	17	43	82	81	44	24		
x	0–30	30–60	60–90	90–120	120–150	150–180	180–210												
f	9	17	43	82	81	44	24												
23	Calculate the mean deviation about median for the following frequency distribution:																		
	<table><tr><td>Class</td><td>0–10</td><td>10–20</td><td>20–30</td><td>30–40</td><td>40–50</td><td>50–60</td></tr><tr><td>Frequency</td><td>6</td><td>8</td><td>14</td><td>16</td><td>4</td><td>2</td></tr></table>	Class	0–10	10–20	20–30	30–40	40–50	50–60	Frequency	6	8	14	16	4	2				
Class	0–10	10–20	20–30	30–40	40–50	50–60													
Frequency	6	8	14	16	4	2													
24	The scores of a batsman in ten innings are 38, 70, 48, 34, 42, 55, 63, 46, 54, 40. Find the mean deviation from the mean.																		
25	Find the mean deviation about mean for the following data:																		
	<table><tr><td>x_i</td><td>3</td><td>5</td><td>7</td><td>9</td><td>11</td><td>13</td></tr><tr><td>f_i</td><td>2</td><td>7</td><td>10</td><td>9</td><td>5</td><td>2</td></tr></table>	x_i	3	5	7	9	11	13	f_i	2	7	10	9	5	2				
x_i	3	5	7	9	11	13													
f_i	2	7	10	9	5	2													
26	Find the mean deviation about the median for the following data:																		
	<table><tr><td>x_i</td><td>5</td><td>7</td><td>9</td><td>10</td><td>12</td><td>15</td></tr><tr><td>f_i</td><td>8</td><td>6</td><td>2</td><td>2</td><td>2</td><td>6</td></tr></table>	x_i	5	7	9	10	12	15	f_i	8	6	2	2	2	6				
x_i	5	7	9	10	12	15													
f_i	8	6	2	2	2	6													
27	Calculate the mean deviation about the mean for the following data:																		
	<table><tr><td>Marks</td><td>140–150</td><td>150–160</td><td>160–170</td><td>170–180</td><td>180–190</td><td>190–200</td></tr><tr><td>No. of students</td><td>4</td><td>6</td><td>10</td><td>18</td><td>9</td><td>3</td></tr></table>	Marks	140–150	150–160	160–170	170–180	180–190	190–200	No. of students	4	6	10	18	9	3				
Marks	140–150	150–160	160–170	170–180	180–190	190–200													
No. of students	4	6	10	18	9	3													
28	Calculate the mean deviation about median for the following data:																		
	<table><tr><td>Class</td><td>0–10</td><td>10–20</td><td>20–30</td><td>30–40</td><td>40–50</td><td>50–60</td></tr><tr><td>Frequency</td><td>6</td><td>7</td><td>15</td><td>16</td><td>4</td><td>2</td></tr></table>	Class	0–10	10–20	20–30	30–40	40–50	50–60	Frequency	6	7	15	16	4	2				
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Frequency	6	7	15	16	4	2													

29	The runs scored by a batsman A were: 28, 60, 38, 24, 32, 45, 53, 36, 44, 34. Find the variance.																							
30	Find the standard deviation for the following data:																							
<table><tr><td>x</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td></tr><tr><td>f</td><td>3</td><td>12</td><td>18</td><td>12</td><td>3</td></tr></table>									x	10	11	12	13	14	f	3	12	18	12	3				
x	10	11	12	13	14																			
f	3	12	18	12	3																			
31	Calculate the variance and standard deviation for the following data:																							
<table><tr><td>Size of item</td><td>3.5</td><td>4.5</td><td>5.5</td><td>6.5</td><td>7.5</td><td>8.5</td><td>9.5</td></tr><tr><td>Frequency</td><td>3</td><td>7</td><td>22</td><td>60</td><td>85</td><td>32</td><td>8</td></tr></table>									Size of item	3.5	4.5	5.5	6.5	7.5	8.5	9.5	Frequency	3	7	22	60	85	32	8
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<table><tr><td>Marks</td><td>20–30</td><td>30–40</td><td>40–50</td><td>50–60</td><td>60–70</td><td>70–80</td><td>80–90</td></tr><tr><td>No. of students</td><td>3</td><td>51</td><td>122</td><td>141</td><td>130</td><td>51</td><td>2</td></tr></table>									Marks	20–30	30–40	40–50	50–60	60–70	70–80	80–90	No. of students	3	51	122	141	130	51	2
Marks	20–30	30–40	40–50	50–60	60–70	70–80	80–90																	
No. of students	3	51	122	141	130	51	2																	
Case Study																								
33	A Mathematics teacher conducted a test with 10 students in Class XI to assess their understanding of the chapter "Real Statistics." The test was scored out of a maximum of 20 marks. The teacher aims to analyze the performance of the students to identify areas of improvement, design targeted interventions, and motivate students to excel in future tests. Marks Obtained by Students: 12, 18, 15, 10, 20, 14, 16, 9, 11, 17 (i) Find the mean marks. (ii) Find the mean of square of their marks. (iii) Find the variance. - OR - Find the standard deviation.																							
34	A teacher wants to analyze the performance of 50 students in a Mathematics test to identify patterns and trends in their marks distribution. The teacher collects the marks of all 50 students, organizes them into class intervals such as 0-10, 10-20, 20-30, and so on, and counts the number of students whose marks fall within each interval. Using this data, the teacher creates a histogram to represent the frequency distribution. (i) Find the mean deviation about median. (ii) Find the mean deviation about mean.																							

Answers

1	C	2	A	3	B	4	A
5	C	6	B	7	A	8	B
9	B	10	A	11	A	12	C
13	D	14	C	15	D	16	D
17	C	20					

18	(a) Both (A) and (R) are true and (R) is the correct explanation of (A).
19	(b) Both A and R are true but R is not the correct explanation of A.
20	Mean = 62, Variance = 201, Standard Deviation = 14.18
21	Mean = 60.65, Variance = 668.25, Standard Deviation = 25.85
22	Mean = 118.7, Variance = 1807.29, Standard Deviation = 42.51
23	Median = 25 Mean Deviation = 10.34
24	Mean $(\bar{x}) = \frac{490}{10} = 49$. M.D. $= \frac{1}{n} \sum x_i - \bar{x} = \frac{92}{10} = 9.2$.
25	$N = \sum f_i = 35$, $\bar{x} = \frac{\sum f_i x_i}{N} = \frac{273}{35} = 7.8$. M.D. $(\bar{x}) = \frac{1}{N} \sum x_i - \bar{x} = \frac{18}{35} = 0.51$.
26	$N = \sum f_i = 26$, Median $M = 7$, M.D. (Median) $= \frac{1}{N} \sum x_i - M = \frac{84}{26} = 3.23$.
27	Assumed mean $A = 175$, $d_i = \frac{x_i - 175}{10}$, $\sum f_i d_i = -19$, $\bar{x} = 175 + \frac{-19}{50} \times 10 = 171.2$. So, M.D. $(\bar{x}) = \frac{\sum f_i x_i - \bar{x} }{N} = \frac{\sum f_i x_i - 171.2 }{50} = \frac{519.6}{50} = 10.39$.
28	$N = 50$, Median = 28, M.D. (Median) $= \frac{1}{N} \sum f_i x_i - M = \frac{508}{50} = 10.16$.
29	Let assumed mean = 45. Then, $d_i = x_i - A = x_i - 45$, $\sum d_i = -56$, $\sum d_i^2 = 1440$, $n = 10$. $\text{Var}(X) = \frac{\sum d_i^2}{n} - \left(\frac{\sum d_i}{n} \right)^2 = \frac{1440}{10} - \left(\frac{-56}{10} \right)^2 = 112.64$
30	S.D. $= \sqrt{\sum \frac{f_i d_i^2}{N} - \left(\frac{\sum f_i d_i}{N} \right)^2}$ where $d_i = x_i - 12$, $N = 48$, $\sum f_i d_i = 0$, $\sum f_i d_i^2 = 48$.
31	$\text{Var}(X) = \sum \frac{f_i d_i^2}{N} - \left(\frac{\sum f_i d_i}{N} \right)^2 = \frac{362}{217} - \left(\frac{128}{217} \right)^2 = 1.321$ S.D. $= \sqrt{1.321} = 1.149$.

32	$N = 500, y_i = \frac{x_i - 55}{10}, \Sigma f_i y_i = 5, \Sigma f_i y_i^2 = 705, h = 10.$ $\text{Mean} = A + \frac{\Sigma f_i y_i}{N} \times h = 55 + \left(\frac{5}{500} \right) 10 = 55.1.$ $\text{Variance } (\sigma^2) = \left[\frac{\Sigma f_i y_i^2}{N} - \left(\frac{(\Sigma f_i y_i)}{N} \right)^2 \right] h^2 = \left[\frac{705}{500} - \left(\frac{5}{500} \right)^2 \right] 100 = \frac{14099}{100} = 140.99.$		
33i	14	33ii	210
33iii	14	33iii	3.74
34i	Median deviation about median $= \frac{628.75}{50} = 12.575$	34ii	Mean deviation about mean $= \frac{636.8}{50} = 12.74$