### Common mistakes & How to avoid

**X-Math**

**Chapter: Statistics & Probability**

<table>
<thead>
<tr>
<th>Types of Question</th>
<th>Common Mistakes</th>
<th>Points to be emphasised</th>
</tr>
</thead>
</table>
| Questions based on calculation of Mean | - Error in formula  
- Forgot to write formula  
- Calculation mistakes in finding $f_i x_i$ & sum of $f_i x_i$  
- Not using the specified method | - Remember and write the correct formula while answering the questions on arithmetic mean.  
- Use the method specified in the question or otherwise choose the appropriate method by carefully observing the figures given.  
- If the values are large and all $d_i$’s have a common factor, use step deviation method.  
- Calculate up to two decimal places |
| | - Calculation mistakes while finding the missing frequencies  
- Add the value of ‘p’ along with the data e.g. $250+10p = 260p$  
- Multiply $f$ while finding the sum of frequency($f_i$) & $f_i x_i$ | - Remember that only like terms can be combined.  
- While finding the sum you should add the unknown frequency with known frequency.  
- Calculate up to two decimal places |
| Question based on mode | - Forget to write the formula  
- Error in writing the formula  
- Substituting wrong values of $f_0, f_1, f_2$ | Remember the correct formula  
- For grouped frequency distribution  
\[
\text{Mode} = \ell + \left( \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right) \times h
\]

\[f_0: \text{frequency of the class preceding the modal class}\]
\[f_1: \text{frequency of modal class}\]
\[f_2: \text{frequency of class succeeding the modal class}\]
\[\ell: \text{Lower limit of modal class}\]
\[h: \text{class size}\]

Now remember that $f_1$ is the frequency of the modal class 0 comes before 1 so $f_0$ is the frequency of previous class and 2 comes after 1.
### Questions based on Median

- Forget to write the formula
- Error in identification of median class
- Substitute the cumulative frequency of median class in place of cumulative frequency of preceding class. Substitute incorrect frequency in place of frequency of median class
- Error in converting less than and more than data types to standard frequency tables

- Identifying the median class is of prime importance to these questions as the whole formula depends on that.
- Convert less than and more than type distribution carefully
- Remember the formula and the terminologies correctly

For grouped data

Now find median class by locating the class whose cumulative frequency is greater than (and nearest to) \( \frac{n}{2} \)

\[
\text{Median} = \ell + \left( \frac{\frac{n}{2} - \text{cf}}{f} \right) \times h
\]

- \( \text{cf} \): cumulative frequency of class preceding the median class
- \( f \): frequency of the median class
- \( \ell \): lower limit of median class
- \( h \): class size

### Questions based on representing the cumulative frequency distribution graphically

- Error in representation of curve
  - Join the points of the curve with ruler (scale)
  - Forget to write the quantities represented on the horizontal & vertical axis.
  - Error while plotting the respective points.

- Join all the points of the curve with free hand (smooth curve).
- Mark the upper limit/ lower limit of the class interval on the horizontal (x axis) & their corresponding cumulative frequencies on the vertical axis (y axis)
- Plot the lower/upper limit with their corresponding frequencies
- Quick points to determine whether the curve is less than ogive or more than ogive

<table>
<thead>
<tr>
<th>Less than ogive</th>
<th>More than ogive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Upper limit</td>
<td>1. Lower limit</td>
</tr>
<tr>
<td>represented on x axis</td>
<td>represented on y axis</td>
</tr>
<tr>
<td>2. Rising curve</td>
<td>2. Fall in curve</td>
</tr>
<tr>
<td>3. Values of</td>
<td>3. Values of</td>
</tr>
</tbody>
</table>
cumulative frequency would decrease with increasing values of upper limit

The median of grouped data is the $x$ coordinate of the point of intersection of less than & more than ogive.

- Practise questions

- The first step is to compute the cumulative frequency then only you can comment on nature of curve.
- Double check after finding the corresponding cumulative frequency.
- Practise questions

<table>
<thead>
<tr>
<th>Questions based finding the Probability</th>
<th>Don’t write the total outcomes of the event</th>
<th>Forget to write the formula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Error while counting of outcomes in case of cards</td>
<td>e.g. in case of cards numbered from 15 to 30, they count it as 15 instead of 16</td>
</tr>
</tbody>
</table>

- write total outcomes, favourable outcomes, the formula and then calculate the probability

- For card questions remember the card type split up.

**Deck of cards (52)**

<table>
<thead>
<tr>
<th>Heart (13)</th>
<th>Spade (13)</th>
<th>Diamond (13)</th>
<th>Club (13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ace-1</td>
<td>Ace-1</td>
<td>Ace-1</td>
<td>Ace-1</td>
</tr>
<tr>
<td>King-1</td>
<td>King-1</td>
<td>King-1</td>
<td>King-1</td>
</tr>
<tr>
<td>Queen-1</td>
<td>Queen-1</td>
<td>Queen-1</td>
<td>Queen-1</td>
</tr>
<tr>
<td>Jack-1</td>
<td>Jack-1</td>
<td>Jack-1</td>
<td>Jack-1</td>
</tr>
<tr>
<td>(2-10)</td>
<td>(2-10)</td>
<td>(2-10)</td>
<td>(2-10)</td>
</tr>
<tr>
<td>Number cards -9</td>
<td>Number cards -9</td>
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</tr>
</tbody>
</table>

- Heart & Diamond are red coloured cards while spade & club are black coloured cards
- King, Queen & Joker are face cards

Forget to compute the cumulative frequency
- Calculation mistake

- Practise questions

Forget to compute the cumulative frequency

- Calculation mistake

- Practise questions