Instructions: (1) Attempt all questions.
(2) All questions carry equal marks.

1 Define 'Research'. Describe its different types. Evaluate them in terms of degree of control and manipulation involved in them.

OR

1 (a) Distinguish: Basic Research and Applied Research.
(b) What is Exploratory Research Design? - Write its sources.

2 (a) Discuss 'Structured-Undisguised' category of questionnaires, elaborating on the forms of questions included therein.
(b) What precautions should be taken while using primary and secondary data.

OR

2 (a) Distinguish Interval Scale and Ratio Scale.
(b) A bulk purchaser of articles wants to estimate the average purchase volume for each batch. He wants to be 95% confident. The allowable error is ±0.24. The standard deviation is 2.85. Determine the sample size.
(a) The following three types of industrial products are manufactured in a country:

1. Electrical and Electronics goods
2. Chemicals
3. Textiles.

Construct the index of industrial production and index of industrial prices.

(b) The following is the information on likes-dislikes about Hero-Honda bike across different age groups:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Below 20</th>
<th>20-39</th>
<th>40-59</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liked</td>
<td>125</td>
<td>420</td>
<td>60</td>
<td>605</td>
</tr>
<tr>
<td>Disliked</td>
<td>75</td>
<td>220</td>
<td>100</td>
<td>395</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>200</td>
<td>640</td>
<td>160</td>
<td>1000</td>
</tr>
</tbody>
</table>

Can we conclude that the scooter model appeal is independent of age groups?

\[
\chi^2_{2, .05} = 5.991 \quad \chi^2_{3, .05} = 7.82 \quad \chi^2_{4, .05} = 9.49
\]

OR

3 (a) Describe the methods that you would use to analyse the changes in the market price of the shares of a company, which changes on every trading day.

(b) Interpret the following Multiple Linear Regression output:

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Coefficient</th>
<th>St. dev.</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>6.2485</td>
<td>0.2915</td>
<td>21.44</td>
<td>0.000</td>
</tr>
<tr>
<td>Months</td>
<td>0.22707</td>
<td>0.01612</td>
<td>14.09</td>
<td>0.000</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.7890</td>
<td>0.2384</td>
<td>-3.31</td>
<td>0.016</td>
</tr>
</tbody>
</table>

R-Sq = 97.4%  S = 0.3530  d = 1.28  F = 111.56
4 (a) State giving reasons, an appropriate measure of central tendency to be used in following situations:
   (1) To determine the average size of the shoes sold in the shop
   (2) To determine the average wages in the industrial unit.

(b) Write the uses of t-test.  

OR  

4 Write notes on: (any three)  
(1) Run Test  
(2) Factor Analysis  
(3) Discriminant Analysis  
(4) Stratified Random Sampling  
(5) Bivariate Analytical Measures.

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