

### Exercise: Solution for Exercise

#### Step 1: Find the total population.

Total Residents = 25,000 + 18,000 + 15,000 + 12,000 + 10,000 = **80,000**/Total Sample = 1,200 residents

#### Step 2: Calculate each zone's sample size.

Formula: Sample for Zone=(Zone Population/Total Population)×Total Sample Sample for Zone

**Zone P:**  $25,000/80,000 \times 1,200 = 0.3125 \times 1,200 = 375$

- **Zone Q:**  $(18,000/80,000) \times 1,200 = 0.225 \times 1,200 = 270$
- **Zone R:**  $15,000/80,000 \times 1,200 = 0.1875 \times 1,200 = 225$
- **Zone S:**  $12,000/80,000 \times 1,200 = 0.15 \times 1,200 = 180$
- **Zone T:**  $10,000/80,000 \times 1,200 = 0.125 \times 1,200 = 150$

**Step 3: Verify the total.** All results are whole numbers/ $375 + 270 + 225 + 180 + 150 = 1,200$

#### Q1

##### a) Research

Research is an organized and systematic process of collecting, analyzing, and interpreting data in order to discover facts, establish relationships, test hypotheses, and draw meaningful conclusions.

- b) Statistics is concerned with scientific methods for collecting, organizing, summarizing, presenting, and analyzing data, as well as with drawing valid conclusions and making reasonable decisions on the basis of such analysis. In a narrower sense, statistics refers to the data themselves or numbers derived from the data.
- c) Survey: A survey is any activity that collects information in an organised and methodical manner about characteristics of interest from some or all units of a population using well-defined concepts, methods and procedures, and compiles such information into a useful summary form.
- d) Sample: A sample is a portion or a subset of data selected from a population for analysis, chosen in order to represent the population accurately enough to draw valid inferences.
- e) Population: A population is the complete collection of individuals, items, or measurements under consideration in a statistical study, possessing specific characteristics relevant to the research.
- f) Poll: A poll is a form of survey in which information is collected from a sample of individuals, such as voters, in order to draw conclusions about the entire population.
- g) Census: A census is a method of data collection that involves collecting information from every single unit in the population, yielding complete, precise, and exhaustive information.

#### Q2: Difference between a Population and a Sample:

A *population* refers to the entire set of units under study, such as individuals, households, firms, or other entities of interest.

A *sample* is a subset of the population selected for analysis, intended to represent the characteristics of the whole population.

#### Q3: Phases of the Survey Life Cycle:

1. Planning, 2Design and Development, 3 Implementation (Execution), 4Evaluation

#### Q4:

Aspect of Comparison	Questionnaire Survey	Interview Survey
<b>1. Mode of Administration</b>	<b>Self-administered.</b> The respondent reads and fills out the written instrument (paper or online) on their own.	<b>Researcher-administered.</b> An interviewer asks the questions face-to-face or by telephone and records the answers.
<b>2. Researcher's Role</b>	<b>Minimal during data collection.</b> The researcher designs and distributes the form but does not interact directly with the respondent during completion.	<b>Central during data collection.</b> The interviewer is actively involved in asking questions, clarifying doubts, and probing for deeper answers.
<b>3. Key Advantages</b>	<ul style="list-style-type: none"> <li>- <b>Lower cost</b> and logistical effort (especially for large, dispersed samples).</li> <li>- Allows respondent <b>anonymity</b>, which can be better for sensitive topics.</li> <li>- Respondents can answer at their own pace.</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Higher response rates</b> on average.</li> <li>- Interviewer can <b>clarify questions</b>, reducing misunderstandings.</li> <li>- Allows for <b>probing and follow-up questions</b>, yielding richer, more detailed (<b>qualitative</b>) data.</li> <li>- Better for complex questions or populations with literacy challenges.</li> </ul>
<b>4. Key Disadvantages / Challenges</b>	<ul style="list-style-type: none"> <li>- <b>Cannot clarify</b> misunderstood questions, leading to potential errors.</li> <li>- <b>Lower response rates</b> are common (risk of non-response bias).</li> <li>- Limited depth; answers are restricted to the predefined format.</li> <li>- Requires a literate and motivated respondent.</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Higher cost</b> (training, salaries, travel for face-to-face).</li> <li>- <b>More time-consuming</b> per respondent.</li> <li>- Risk of <b>interviewer bias</b> (e.g., tone, appearance influencing answers).</li> <li>- Requires careful training and supervision of interviewers.</li> </ul>
<b>5. Data Type &amp; Flexibility</b>	Primarily yields <b>structured, quantitative data</b> . Best for closed-ended questions. Limited flexibility once distributed.	Can effectively combine <b>quantitative and qualitative data</b> . More flexible; the interviewer can adapt the flow or ask spontaneous follow-ups based on responses.
<b>6. Example from Text</b>	A <b>mailed survey</b> of 2,000 households about the number of children.	<b>Personal interviews</b> (face-to-face or telephone) conducted by a trained interviewer.