Research definition-

1. **A systematic and organized investigation.**
2. **Aimed at discovering or verifying facts.**
3. **Based on data collection and analysis.**
4. **Helps solve problems and generate knowledge.**

1. Research should be systematic – it must follow an organized and step-by-step process.
2. It should be logical – the methods and reasoning must be sound and meaningful.
3. It must be empirical – based on real observations or data, not just theory.
4. The research should be replicable – others should be able to repeat it with similar results.
5. It should aim at finding solutions or contributing valuable knowledge.

Crirteria for good research

Point	Research Methods	Research Methodology
1. Meaning	Tools to carry out research	Study of how research is done
2. Focus	Practical steps	Theoretical approach
3. Scope	Narrow (execution)	Broad (planning + logic)
4. Purpose	Data collection & analysis	Justify choice of methods
5. Example	Survey, interview	Choosing between methods and explaining why

🔶 3.5 Applied vs Basic Research (Recap of 3.2 — Simplified)

'oint	Applied Research	Basic (Fundamental) Research
I. Focus	Practical problem-solving	Expanding knowledge base
! Results	Immediate and useful	Long-term understanding
I. Driven by	Need or demand	Curiosity
I. Area	Technology, industry, society	Science, education
I. Example	Improving traffic system	Studying human brain functioning

🔶 3.4 Conceptual vs Empirical Research

Point	Conceptual Research	Empirical Research
1. Based on	Theories and ideas	Observations and experiments
2. Nature	Abstract, logical reasoning	Practical, field-based
3. Data	No real-world data	Collects real-world data
4. Use	Philosophy, law; conceptual analysis	Natural and social sciences
5. Example	Paper on democracy concepts	Survey on voting behavior

🔶 3.3 Quantitative vs Qualitative Research

Point	Quantitative Research	Qualitative Research
1. Nature	Numerical and measurable	Descriptive and subjective
2. Tools	Surveys, experiments	Interviews, case studies
3. Analysis	Statistical methods	Thematic analysis
4. Outcome	Objective facts	Insights, emotions, meanings
5. Example	Income level survey	Customer satisfaction interview

🔶 3.2 Applied vs Fundamental Research

Point	Applied Research	Fundamental Research
1. Goal	Solve specific real-world problems	Gain knowledge or theory
2. Scope	Narrow and practical	Broad and theoretical
3. Use	Industry, engineering, healthcare	Academic and scientific exploration
4. Result	Immediate application	Future understanding
5. Example	Vaccine development	Studying cell behavior

🔶 3.1 Descriptive vs Analytical Research

Point	Descriptive Research	Analytical Research
1. Purpose	Describes current status	Analyzes cause-effect or relationship
2. Based on	Observation and facts	Interpretation of data
3. Data	Raw facts collected	Uses existing or secondary data
4. Example	Population census	Examining why sales dropped
5. Outcome	"What is happening?"	"Why is it happening?"

Research Problem

Definition (2 Points):

1. A research problem is a clear, specific issue or concern that a researcher wants to investigate
2. It forms the base of the entire research process and guides the direction of the study.

Components of a Research Problem

1. **Subject Area** – The broad field or domain of the study (e.g., education, healthcare).
2. **Objectives** – What the researcher wants to achieve through the study.
3. **Variables** – The key factors or concepts involved in the problem.
4. **Population** – The group or sample being studied.
5. **Assumptions & Limitations** – Conditions under which the research will operate.

Selection of a Research Problem

1. **Interest and Expertise** – Choose a topic you are curious a
2. **Feasibility** – Consider time, resources, and availability of d
3. **Relevance** – Ensure the problem is significant and useful f
4. **Novelty** – It should be original or offer a new perspective.
5. **Ethical Considerations** – It must not harm individuals or v

Research Process

Definition (2 Points):

1. Research process is a step-by-step method used to conduct scientific investigations.
2. It helps in identifying a problem, collecting relevant data, and finding a meaningful solution or conclusion.

Structure of Research Process

a. **Define the Research Problem**

- Clearly identify what needs to be studied or solved.
- It gives direction and purpose to the study.

b. **Review Concepts, Theory, and Previous Works**

- Study existing literature to understand what is already known.
- Helps avoid duplication and builds the foundation for new work.

c. **Formulate Hypothesis**

- Make a testable statement or assumption.
- It predicts the relationship between variables.

d. **Design the Research**

- Plan how the study will be conducted (methods, tools, samples).
- Ensures accuracy, consistency, and feasibility.

e. **Collection of Data**

- Gather information using surveys, interviews, experiments, etc.
- Data must be reliable and relevant.

f. **Analysis of Data**

- Process and examine the data using tools or software.
- Helps in identifying patterns, relationships, or trends.

g. **Interpret and Report the Findings**

- Explain the meaning of results and write the research report.
- The report must be clear, structured, and objective.

Report Writing

Definition (2 Points):

1. Report writing is the process of presenting research findings in a structured, written form.
2. It communicates the purpose, methods, results, and conclusions of a study clearly and systematically.

Steps in Report Writing

1. **Define the purpose** – Understand the aim of t
2. **Identify the audience** – Know who will read th
3. **Collect and organize information** – Gather all
4. **Prepare a draft** – Write a rough version with a
5. **Revise and finalize** – Edit for clarity, grammar,

Layout of a Research/Project Report

1. **Title Page** – Name of the report, author, instit
2. **Acknowledgement** – Expressing gratitude to t
3. **Abstract/Summary** – Brief overview of the ent
4. **Table of Contents** – Lists headings and subhea
5. **Introduction** – Explains the problem, objectiv

Sampling Methods

Definition:

Sampling methods are techniques used to select a small group (sample) from a larger group (population) to conduct research. The sample represents the whole population, making the study faster, cheaper, and manageable.

Types of Sampling Methods

A. Probability Sampling (Each unit has a known chance of selection)

1. **Simple Random Sampling** – Every member has an equal chance of being selected.
2. **Stratified Sampling** – Population is divided into groups (strata), and samples are taken from each.
3. **Systematic Sampling** – Every nth member is selected from a list.
4. **Cluster Sampling** – Population is divided into clusters; a few clusters are randomly selected.
5. **Multi-stage Sampling** – Sampling is done in multiple steps or stages (used in large-scale surveys).

B. Non-Probability Sampling (Selection is based on researcher's judgment)

1. **Convenience Sampling** – Sample is taken from easily accessible people.
2. **Judgmental or Purposive Sampling** – Sample is chosen based on expert knowledge.
3. **Snowball Sampling** – Existing subjects recruit future subjects from their contacts.
4. **Quota Sampling** – Researcher ensures specific groups are represented in the sample.