


CMR INSTITUTE OF TECHNOLOGY		USN								
Internal Assessment Test 1 – March 2024										
Sub:	Research Methodology & IPR							Sub Code:	22RMI18	
Date:	14/03/2024	Duration:	90 min's	Max Marks:	50	Sem:	I	Branch:	MCA	
Note : Answer FIVE FULL Questions, choosing ONE full question from each Module										
PART I							MARKS	OBE		
								CO	RBT	
1	Differentiate between research methods and research methodology, highlighting their respective roles in the research process. OR						[10]	CO1	L2	
2	Explain with short notes on criteria on good research						[10]	CO1	L2	
PART II							[10]	CO1	L2	
3	Briefly describe the different steps involved in a research process.									
4	What are the problems that encountered by researchers in India?						[10]	CO1	L2	
PART III							[10]	CO1	L2	
5	Describe the different types of research and explain in brief OR									
6	Write Short notes on a) Objectives of research b) Research and Scientific Method						[10]	CO1	L2	
PART IV							[10]	CO1	L2	
7	a) When can a Problem become a research problem? b) Write short notes on Components of a research problem OR									
8.	What are the steps involved in selecting the problem.						[10]	CO1	L2	
PART V							[10]	CO5	L2	
9.	Write a comprehensive note on the “ Task of defining a research problem” OR									
10.	Describe fully the techniques of defining a research problem.						[10]	CO5	L3	

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PART I

1. Differentiate between research methods and research methodology, highlighting their respective roles in the research process.

Research plays a crucial role in generating new knowledge and advancing various fields of study. When conducting research, it is essential to understand the distinction between research method and research methodology. While the two terms are often used interchangeably, they refer to distinct aspects of the research process. In this article, we will explore the key differences between research method and research methodology, highlighting their unique characteristics and roles in the research endeavor.

Research Method	Research Methodology
Focuses on the techniques and tools used to gather data	Concerned with the overall strategy and framework of research
Involves specific procedures and steps to obtain information	Deals with the theoretical and philosophical underpinnings
Determines the type of data to be collected and analyzed	Guides the researcher in selecting appropriate research methods
Examples include surveys, experiments, interviews, observations	Examples include qualitative, quantitative, and mixed methods
Describes the process of data collection and analysis	Provides a systematic approach to conducting research
Relates to the practical aspects of research	Relates to the theoretical aspects of research
A subset of research methodology	Encompasses the entire research process
Specific to a particular research project or study	Applicable across different research projects and studies
Research method is more concrete and tangible	Research methodology is more abstract and conceptual
Determines the reliability and validity of research findings	Determines the overall validity and soundness of research

1. Both research method and research methodology are integral components of the research process.
2. They contribute to the generation of new knowledge and understanding in various fields.
3. Both research method and research methodology require careful planning and consideration.
4. They aim to provide a systematic and structured approach to conducting research.
5. Both research method and research methodology can be tailored to suit the specific needs of a study.
6. They involve the selection and application of appropriate techniques and tools.
7. Research method and research methodology contribute to the validity and reliability of research findings.
8. They can be influenced by the nature of the research question and the discipline of study.
9. Both research method and research methodology require the researcher to make informed decisions.
10. They contribute to the advancement and improvement of research practices.

2. Explain with short notes on criteria on good research

- Good research is systematic
- Good research is logical
- Good research is empirical
- Good research is replicable

The purpose of the research should be clearly defined and common concepts be used.

The statement of the research problem should include analysis into its simplest elements, its scope and limitations, and precise specifications of the meanings of all words significant to the research. Failure of the

researcher to do this adequately may raise legitimate doubts in the minds of readers as to whether the researcher has sufficient understanding of the problem to make a sound attack upon it.

The research procedure used should be described in sufficient detail to permit another researcher to repeat the research for further advancement, keeping the continuity of what has already been attained.

Excepting when secrecy is imposed in the national interest, research reports should reveal with candor the sources of data and the means by which they were obtained. Omission of significant procedural details makes it difficult or impossible to estimate the validity and reliability of the data and justifiably weakens the confidence of the reader in the research.

The procedural design of the research should be carefully planned to yield results that are as objective as possible.

When a sampling of a population is involved, the report should include evidence concerning the degree of representativeness of the sample. A questionnaire ought not to be used when more reliable evidence is available from documentary sources or by direct observation. Bibliographic searches should be as thorough and complete as possible. Experiments should have satisfactory controls. Direct observations should be recorded in writing as soon as possible after the event. Efforts should be made to minimize the influence of personal bias in selecting and recording data.

The researcher should report with complete frankness, flaws in procedural design and estimate their effects upon the findings.

There are very few perfect research designs. Some of the imperfections may have little effect upon the validity and reliability of the data; others may invalidate them entirely. A competent researcher should be sensitive to the effects of imperfect design and his experience in analyzing the data should give him a basis for estimating their influence.

The analysis of data should be sufficiently adequate to reveal its significance and the *methods of analysis used should be appropriate*. The validity and reliability of the data should be checked carefully.

The extent to which this criterion is met is frequently a good measure of the competence of the researcher. Twenty years of experience in guiding the research of graduate students leads the writer to conclude that adequate analysis of the data is the most difficult phase of research for the novice.

The validity and reliability of data should be checked carefully. The data should be classified in ways that assist the researcher to reach pertinent conclusions. When statistical methods are used, the probability of error should be estimated and the criteria of statistical significance applied.

Conclusions should be confined to those justified by the data of the research and limited to those for which the data provide an adequate basis.

Researchers are often tempted to broaden the bases of inductions by including personal experiences not subject to the controls under which the research data were gathered. This tends to decrease the objectivity of the research and weaken confidence in the findings. Equally undesirable is the all-too-frequent practice of drawing conclusions from study of a limited population and applying them universally. Good researchers specify the conditions under which their conclusions seem to be valid. Failure to do so justifiably weakens confidence in the research.

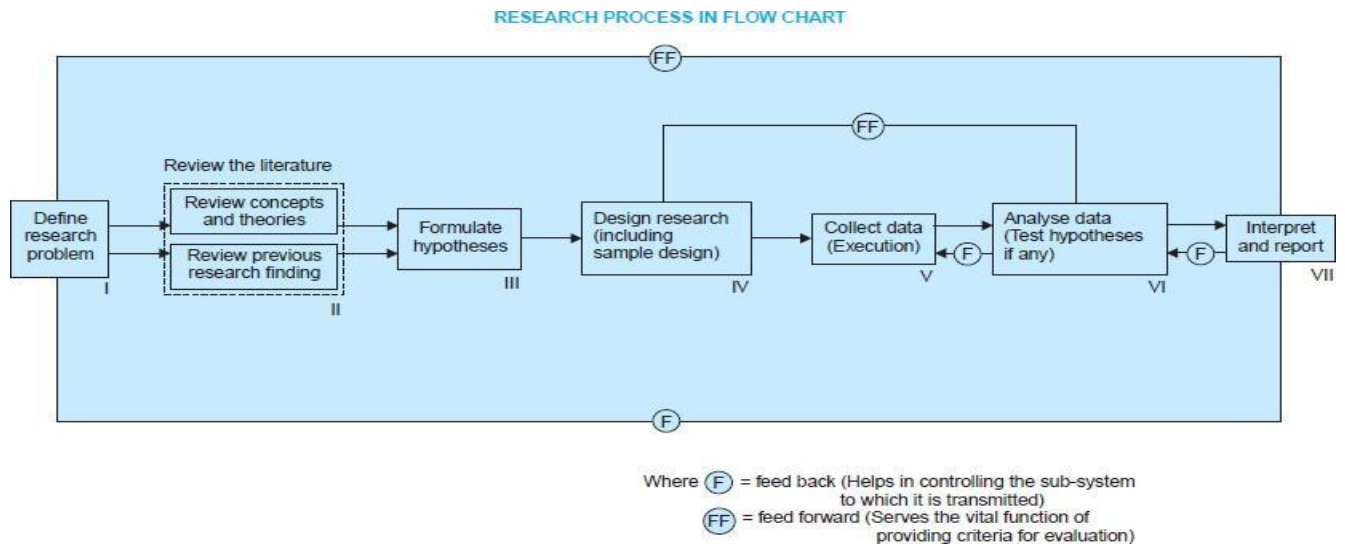
Greater confidence in research is warranted if the researcher is experienced, has a good reputation in research and is a person of integrity

Were it possible for the reader of a research report to obtain sufficient information about the researcher, this criterion perhaps would be one of the best bases for judging the degree of confidence a piece of research warrants. For this reason, the research report should be accompanied by more information about the qualifications of the researcher than is the usual practice.

PART II

3. Briefly describe the different steps involved in a research process.

- Research process consists of series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps.
- The chart shown below well illustrates a research process.



- One should remember that the various steps involved in a research process are **not mutually exclusive**; nor they are separate and distinct. They do not necessarily follow each other in any specific order.
- However, the following order concerning various steps provides a useful procedural guideline regarding the research process:
 - (1) formulating the research problem;
 - (2) extensive literature survey;
 - (3) developing the hypothesis;
 - (4) preparing the research design;
 - (5) determining sample design;
 - (6) collecting the data
 - (7) execution of the project;
 - (8) analysis of data;
 - (9) hypothesis testing;
 - (10) Generalizations and interpretation, and
 - (11) preparation of the report or presentation of the results, i.e., formal write-up of conclusions reached.

Formulating the research problem

- There are two types of research problems:
 - those which relate to *states of nature* and
 - those which relate to *relationships between variables*.
- At the very outset the researcher must single out the problem he wants to study, i.e., he must decide the general area of interest or aspect of a subject-matter that he would like to inquire into, Initially the problem may be stated in a broad general way and then the ambiguities, if any, relating to the problem be resolved, then the feasibility of a particular solution has to be considered before working on formulation.
- Formulation of the problem can be set up. Often, the guide puts forth the problem in general terms and it is up to the researcher to narrow it down and phrase the problem in operational terms.
- He may review **two types of literature**
 - the *conceptual literature* concerning the concepts and theories, and
 - the *empirical literature* consisting of studies made earlier which are similar to the one proposed.
- The **statement of the objective is of basic importance** because it determines the data which are to be collected, the characteristics of the data which are relevant, relations which are to be explored, the choice of techniques to be used.

Extensive literature survey

- Once the problem is formulated, a brief summary of it should be written down.
- It is compulsory for a research worker writing a thesis for a Ph.D. degree to write a synopsis of the topic and submit it to the necessary Committee, For this purpose, the abstracting and indexing journals and published or unpublished bibliographies are the first place to go to.
- Academic journals, conference proceedings, government reports, books etc., One can use some search engines like “google” or specially “google scholars” to search scholarly articles.
- A good library will be a great help to the researcher at this stage.

Development of working hypotheses

- After extensive literature survey, researcher should state in clear terms the working hypothesis or hypotheses. **Working hypothesis** is tentative assumption made in order to draw out and test its logical or empirical consequences.
- Hypothesis should be **very specific and limited to the piece of research** in hand because it has to be tested. The role of the hypothesis is to guide the researcher by delimiting the area of research and **to keep him on the right track**. It also indicates the type of data required and the type of methods of data analysis to be used.

- How does one go about developing working hypotheses?

The answer is by using the following approach:

- a) Discussions with colleagues and experts about the problem, its origin and the objectives in seeking a solution;
- b) Examination of data and records, if available, concerning the problem for possible trends, peculiarities and other clues;
- c) Review of similar studies in the area or of the studies on similar problems; and
- d) Exploratory personal investigation which involves original field interviews on a limited scale with interested parties and individuals with a view to secure greater insight into the practical aspects of the problem.

Preparing the research design

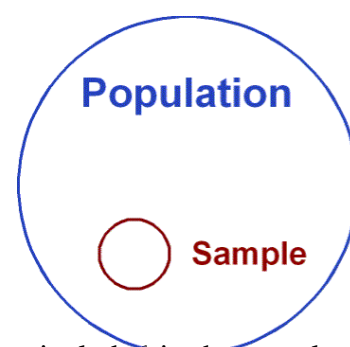
- The function of research design is to provide for the collection of relevant evidence with minimal expenditure of effort, time and money. But how all these can be achieved depends mainly on the research purpose.
- Research purposes may be grouped into four categories:
 - (i) Exploration
 - (ii) Description
 - (iii) Diagnosis
 - (iv) Experimentation
- There are several research designs, such as, experimental and non-experimental hypothesis testing. Experimental designs can be either informal designs (such as before- and-after without control, after-only with control, before-and-after with control) or formal designs (such as completely randomized design, randomized block design, Latin square design, simple and complex factorial designs), out of which the researcher must select one for his own project.
- The preparation of the research design, appropriate for a particular research problem, involves usually the consideration of the following:
 - (i) the **means of obtaining the information**;
 - (ii) the **availability and skills** of the researcher and his staff (if any);
 - (iii) explanation of the way in which selected means of obtaining information will be **organized** and the **reasoning** leading to the selection;
 - (iv) the **time available** for research; and
 - (v) the **cost factor** relating to research, i.e., the finance available for the purpose.

Determining sample design

- The researcher must decide the way of **selecting a sample** or what is popularly known as the

sample design.

- In other words, a **sample design is a definite plan** determined before any data are actually collected for obtaining a sample from a given population.
- Samples can be either **probability** samples or **non-probability** samples

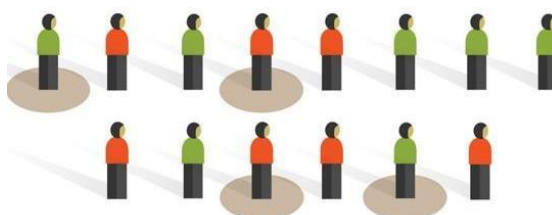


- With **probability samples** each element has a known probability of being included in the sample but the **non-probability samples** do not allow the researcher to determine this probability.
- Probability samples are those based on simple random sampling, systematic sampling, stratified sampling, cluster/area sampling.
- Non-probability samples are those based on convenience sampling, judgement sampling and quota sampling techniques.

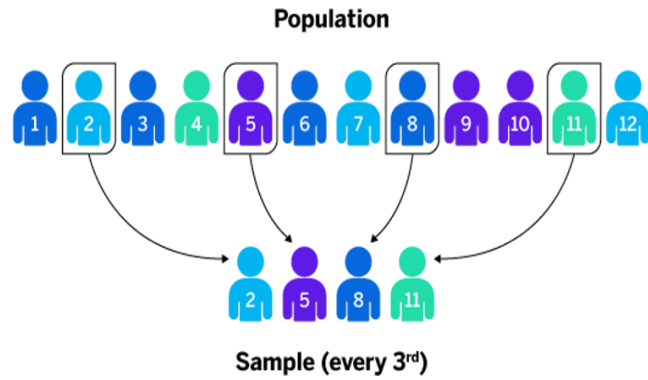
A brief mention of the important sample designs is as follows:

- Deliberate sampling** : This sampling method involves purposive or deliberate selection of particular units of the universe, When population elements are selected for inclusion in the sample based on the ease of access, it can be called convenience sampling. In judgement sampling the researcher's judgement is used for selecting items which he considers as representative of the population. For example, a judgement sample of college students might be taken to secure reactions to a new method of teaching.
- Simple random sampling** : This type of sampling is also known as chance sampling or probability sampling where each and every item in the population has an equal chance of inclusion in the sample, For example, if we have to select a sample of 300 items from a universe of 15,000 items, then we can put the names or numbers of all the 15,000 items on slips of paper and conduct a lottery.

Simple random sampling

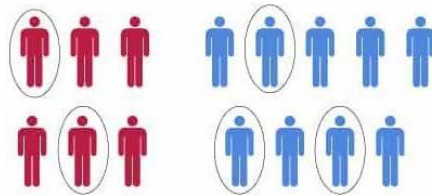


- Systematic sampling**: In some instances, the most practical way of sampling is to select every 15th name on a list, every 10th house on one side of a street and so on. Sampling of this type is known as systematic sampling. An element of randomness is usually introduced into this kind of sampling by using random numbers to pick up the unit with which to start.

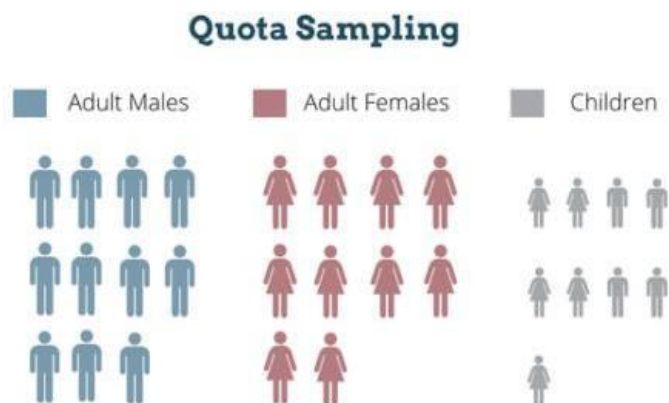


- (iv) **Stratified sampling:** In this technique, the population is stratified into a number of nonoverlapping subpopulations or strata and sample items are selected from each stratum. If the items selected from each stratum is based on simple random sampling the entire procedure, first stratification and then simple random sampling, is known as stratified random sampling.

Stratified random sampling

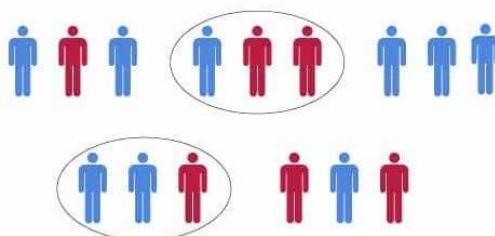


- (v) **Quota sampling:** In stratified sampling the cost of taking random samples from individual strata is often so expensive that interviewers are simply given quota to be filled from different strata, the actual selection of items for sample being left to the interviewer's judgement. This is called quota sampling.



- (vi) **Cluster sampling and area sampling:** Cluster sampling involves grouping the population and then selecting the groups or the clusters rather than individual elements for inclusion in the sample. For example The sample size is to be kept say 450. For cluster sampling this list of 15,000 card holders could be formed into 100 clusters of 150 card holders each. Three clusters might then be selected for the sample randomly.
- Under area sampling we first divide the total area into a number of smaller non- overlapping areas, generally called geographical clusters, then a number of these smaller areas are randomly selected, and all units in these small areas are included in the sample.

Cluster sampling



- (vii) **Multi-stage sampling:** This technique is meant for big inquiries extending to a considerably large geographical area like an entire country. Under multi-stage sampling the first stage may be to select large primary sampling units such as states, then districts, then towns and finally certain families within towns.



- (viii) **Sequential sampling:** This is somewhat a complex sample design where the ultimate size of the sample is not fixed in advance but is determined according to mathematical decisions on the basis of information yielded as survey progresses.

Collecting the data

- In dealing with any real-life problem, it is often found that data at hand are inadequate, and hence, it becomes necessary to collect data that are appropriate.
- Primary data can be collected either through **experiment or through survey**. If the researcher conducts an experiment, he observes some quantitative measurements, or the data, with the help of which he examines the truth contained in his hypothesis.
- But in the case of a survey, data can be collected by any one or more of the following ways:
 - (i) **By observation**: This method implies the collection of information by way of investigator's own observation, without interviewing the respondents. The information obtained relates to what is currently happening and is not complicated by either the past behavior or future intentions or attitudes of respondents. As such this method is not suitable in inquiries where large samples are concerned.
 - (ii) **Through personal interview**: The investigator follows a rigid procedure and seeks answers to a set of pre-conceived questions through personal interviews.
 - (iii) **Through telephone interviews**: This method of collecting information involves contacting the respondents on telephone itself. It plays an important role in industrial surveys in developed regions.
 - (iv) **By mailing of questionnaires**: Questionnaires are mailed to the respondents with a request to return after completing the same. It is the most extensively used method in various economic and business surveys.
 - (v) **Through schedules**: Under this method the enumerators are appointed and given training. They are provided with schedules containing relevant questions. These enumerators go to respondents with these schedules. Data are collected by filling up the schedules by enumerators on the basis of replies given by respondents.

Execution of the project

- Execution of the project is a very important step in the research process. If the execution of the project proceeds on correct lines, the data to be collected would be adequate and dependable.
- If the survey is to be conducted by means of **structured questionnaires**, data can be readily machine-processed. In such a situation, questions as well as the possible answers may be coded, If the data are to be collected through interviewers, arrangements should be made for proper selection and training of the interviewers. The training may be given with the help of instruction manuals which explain clearly the job of the interviewers at each step. Occasional field checks should be made, make a **list of non-respondents** and take a small sub sample of them.

Analysis of data

- After the data have been collected, the researcher turns to the task of analysing them. The analysis of data requires a number of closely related operations such as establishment of categories, the application of these categories to raw data through *coding*, *tabulation* and then drawing statistical inferences. The researcher can classify the raw data into some purposeful and usable categories by using the following techniques :
 - **Coding operation** is usually done at this stage through which the categories of data are transformed into symbols that may be tabulated and counted.
 - **Editing** is the procedure that improves the quality of the data for coding. With coding the stage is ready for tabulation.
 - **Tabulation** is a part of the technical procedure wherein the classified data are put in the form of tables.

Hypothesis-testing

- Do the facts support the hypotheses or they happen to be contrary? This is the usual question which should be answered while testing hypotheses.
- Various tests, such as *Chi square test*, *t-test*, *F-test*, have been developed by statisticians for the purpose. The hypotheses may be tested through the use of one or more of such tests, depending upon the nature and object of research inquiry.
- Hypothesis-testing will result in either accepting the hypothesis or in rejecting it. If the researcher had no hypotheses to start with, generalisations established on the basis of data may be stated as hypotheses.

Generalisations and interpretation

- If a hypothesis is tested and upheld several times, it may be possible for the researcher to arrive at **generalisation**, i.e., to build a theory. As a matter of fact, the real value of research lies in its ability to arrive at certain generalisations.
- If the researcher had no hypothesis to start with, he might seek to explain his findings on the basis of some theory. It is known as **interpretation**.
- The process of interpretation may quite often trigger off new questions which in turn may lead to further researches.

Preparation of the report or the thesis

Finally, the researcher has to prepare the report of what has been done by him. Writing of report must be done with great care keeping in view the following:

1. The layout of the report should be as follows:
 - (i) the preliminary pages
 - (ii) the main text
 - (iii) the end matter.

4. What are the problems that encountered by researchers in India?

Researchers in India, particularly those engaged in empirical research, are facing several problems. Some of the important problems are as follows:

1. The **lack of a scientific training** in the methodology of research
2. There is **insufficient interaction** between the university research departments on one side and business establishments, government departments and research institutions on the other side.
3. Most of the **business units** in our country **do not have the confidence** that the material supplied by them to researchers will not be misused and as such they are often reluctant in supplying the needed information to researchers.
4. **Research studies overlapping** one another are undertaken quite often for want of adequate information.
5. There does not exist a code of conduct for researchers and inter-university and **inter-departmental rivalries** are also quite common.
6. Many researchers in our country also face the **difficulty of adequate and timely secretarial assistance**, including computerial assistance. This causes unnecessary delays in the completion of research studies.
7. **Library management and functioning is not satisfactory** at many places and much of the time and energy of researchers are spent in tracing out the books, journals, reports, etc., rather than in tracing out relevant material from them.
8. There is also the problem that many of our libraries are **not able to get copies of old and new Acts/Rules, reports and other government publications in time**. This problem is felt more in libraries which are away in places from Delhi and/or the state capitals.
9. There is also the **difficulty of timely availability of published data** from various government and other agencies doing this job in our country.
10. There may, at times, take place the problem of conceptualization and also **problems relating to the process of data collection** and related things.

PART III

5. Describe the different types of research and explain in brief

Different types of research are:

- (i) *Descriptive vs. Analytical*
- (ii) *Applied vs. Fundamental*
- (iii) *Quantitative vs. Qualitative*
- (iv) *Conceptual vs. Empirical*
- v) *Some Other Types of Research*

Descriptive vs. Analytical

- **Descriptive research**(*Ex post facto research*) includes surveys and fact-finding enquiries of different kinds, including comparative and correlational methods.
- The *major purpose* of descriptive research is description of the state of affairs as it exists at present.
- The *main characteristic* of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening for example frequency of shopping, preferences of people, or similar data.
- In **analytical research**, on the other hand, the researcher has to use facts or information already available, and analyze these to make a critical evaluation of the material.

Applied vs. Fundamental

- Research can either be applied (or action) research or fundamental (to basic or pure) research.
- **Applied research** aims at finding a solution for an immediate problem facing a society or an industrial/business organization. Research to identify social, economic or political trends that may affect a particular institution/organization.
Ex: study to improve customer retention for a company
- **Fundamental research** is mainly concerned with generalizations and with the formulation of a theory. Research concerning some natural phenomenon or relating to pure mathematics are examples of fundamental research. Research studies, concerning human behaviour with a view to make generalizations, are examples of Fundamental research.

Quantitative vs. Qualitative

- **Quantitative research** is based on the measurement of quantity or amount. Gathering quantifiable data and performing statistical or computation techniques.
Ex: For instance, when we are interested in investigating the reasons for human behavior
—*Motivational Research*:- This type of research aims at discovering the motives and desires, used in depth interviews.
- **Qualitative research**, on the other hand, is concerned with qualitative phenomenon, i.e., phenomena relating to or involving quality or kind.
Ex:
—*Attitude or opinion research*:- This research designed to find out how people feel or what they think about a particular subject or institution.

Conceptual vs. Empirical

- **Conceptual research** is that related to some abstract idea(s) or theory. It is generally used by philosophers and thinkers to develop new concepts or to reinterpret existing ones.
- **empirical research** relies on experience or observation alone, often without due regard for system and theory. In such a research, the researcher must first provide himself with a working hypothesis or guess as to the probable results. He then works to get enough facts (data) to prove or disprove his hypothesis. Empirical research is appropriate when proof is sought that certain variables affect other variables in some way.

Some Other Types of Research

- **one-time research or longitudinal research**: In the former case the research is confined to a single time-period ex: population research. whereas in the latter case the research is carried on over several time-periods ex: panel study.
- **field-setting research or laboratory research or simulation research**: manipulates the factors
- **clinical or diagnostic research**: going deep into the causes of understanding customer problems.
- **exploratory research**: Development of hypothesis without being tested.
- **formalized research**: Development of structure with hypothesis testing.

- **Historical research** is that which utilizes historical sources like documents, remains, etc. to study events or ideas of the past.
- **conclusion-oriented:** conclusion oriented research, a researcher is free to pick up a problem, redesign the enquiry as he proceeds and is prepared to conceptualize as he wishes.
- **decision-oriented:** Decision-oriented research is always for the need of a decision maker and the researcher in this case is not free to embark upon research Ex: Operations research

6. Write Short notes on a) Objectives of research b) Research and Scientific Method

a) Objectives of research

1. Theoretical Objective

- Formulate new theories, principles etc.
- This type of theory is explanatory because it explains the relationship between variables.
- Its mainly used in Physics, Chemistry, Math's etc

2. Factual Objective

- Find out new facts.
- Its of descriptive nature
- These are mainly historical type of research which describes facts or events which has previously happened.

3. Application Objective

- suggest new application, by application here it means improvement and modification in practice.

b) Research and Scientific Method

The scientific method is, thus, based on certain basic *hypothesizes* which can be stated as under:

1. It relies on empirical(*experimental*) evidence;
2. It utilizes relevant concepts;
3. It is committed to only objective considerations;
4. It assumes ethical neutrality, i.e., it aims at nothing but making only *adequate* and *correct statements* about population objects;
5. It results into probabilistic predictions;
6. Its methodology is made known to all concerned for critical scrutiny are for use in testing the conclusions through replication;

7. It aims at formulating most general axioms or what can be termed as scientific theories.

PART IV

7. a) When can a Problem become a research problem?

The problem can become a research problem when it meets certain criteria that make it suitable for investigation and study within the context of research. Here are some factors that can indicate when a problem transitions into a research problem:

Significance: The problem should address a significant issue or gap in knowledge within a particular field or discipline. It should be relevant and important enough to warrant investigation.

Novelty: The problem should involve aspects that haven't been extensively studied or explored before. It should contribute new insights, theories, or findings to the existing body of knowledge.

Feasibility: The problem should be feasible to investigate within the constraints of available resources, including time, funding, and access to data or materials.

Clarity: The problem should be clearly defined and well-articulated, with specific research questions or hypotheses that can guide the investigation.

Testability: The problem should lend itself to empirical investigation, where researchers can design experiments, gather data, and analyze results to test hypotheses or answer research questions.

Interest: The problem should be of interest to researchers and stakeholders within the field, motivating them to pursue investigation and potentially apply findings to practical solutions.

Generalizability: The findings from addressing the problem should have implications beyond the specific context of the study, contributing to broader understanding or application within the field.

When a problem possesses these characteristics, it is likely suitable for research inquiry and can be considered a research problem. Researchers can then design studies, develop methodologies, and conduct investigations to explore and address the problem effectively.

b) Write short notes on Components of a research problem

Components of a research problem refer to the essential elements that define and frame the issue being investigated in a research study. These components help to provide clarity, focus, and direction to the research inquiry. Here are the key components of a research problem:

Topic: The general subject or area of interest that the research problem pertains to. It provides a broad context for the investigation.

Background: A brief overview of the existing knowledge, theories, and research relevant to the topic. This helps to establish the context and significance of the problem.

Gap in Knowledge: Identification of the specific gap or deficiency in the existing literature or understanding of the topic. This highlights why the research problem is important and worth investigating.

Research Question(s) or Hypothesis: Clear and concise statements that articulate the specific inquiries or hypotheses guiding the research. Research questions pose queries to be answered, while hypotheses propose tentative explanations or predictions to be tested.

Scope and Limitations: Definition of the boundaries and constraints within which the research will be conducted. This includes specifying the population, variables, time frame, geographical location, and other relevant parameters.

Objectives or Purpose: The goals or aims of the research, outlining what the study seeks to achieve or accomplish. Objectives provide a roadmap for the research process and help to clarify its intended outcomes.

Significance and Justification: Explanation of why the research problem is important and how addressing it will contribute to knowledge advancement, practical applications, or theoretical understanding within the field.

Theoretical Framework: Identification of relevant theories, models, or conceptual frameworks that inform the research approach and provide a basis for interpretation and analysis of findings.

Methodological Approach: Description of the methods, techniques, and procedures that will be employed to collect, analyze, and interpret data in order to address the research problem effectively.

Expected Outcomes: Anticipation of the potential findings or results that may emerge from the research, based on the research questions, hypotheses, and theoretical framework.

By clearly defining these components, researchers can effectively formulate and communicate their research problem, laying the groundwork for a systematic and rigorous investigation.

8. What are the steps involved in selecting the problem.

Selecting a research problem is a crucial step in the research process as it lays the foundation for the entire study. Here are the steps involved in selecting a research problem:

Identify Your Area of Interest: Begin by identifying areas within your field of study that you find interesting and engaging. Reflect on your academic background, professional experiences, and personal interests to pinpoint potential topics of interest.

Conduct a Literature Review: Review existing literature in your field to identify gaps, controversies, unanswered questions, or emerging trends. Pay attention to areas where there is limited research or conflicting findings, as these may present opportunities for new investigations.

Consult with Experts: Seek guidance from mentors, advisors, or experts in your field. Discuss your interests and ideas with them to gain insights into potential research problems and their significance within the field.

Brainstorm Potential Topics: Engage in brainstorming sessions to generate a list of potential research topics based on your interests and the gaps identified during the literature review. Consider the feasibility, relevance, and significance of each topic.

Narrow Down Your Options: Evaluate the list of potential topics and narrow it down based on criteria such as feasibility, relevance to your academic or career goals, available resources, and potential impact.

Define the Research Problem: Once you have selected a potential topic, refine it into a specific research problem or question. Clearly define the scope, objectives, and significance of the research problem to ensure it aligns with your research interests and objectives.

Consider Practical Constraints: Assess the practical constraints associated with the selected research problem, such as time, budget, access to data or resources, and ethical considerations. Ensure that the chosen problem is feasible given these constraints.

Seek Feedback: Present your proposed research problem to peers, colleagues, or mentors for feedback and validation. Solicit their input on the clarity, relevance, and potential impact of the research problem, and make any necessary adjustments based on their suggestions.

Finalize Your Research Problem: After incorporating feedback and considering practical constraints, finalize your research problem. Ensure that it is well-defined, feasible, and aligns with your interests and goals as a researcher.

By following these steps, you can systematically identify, evaluate, and select a research problem that is both intellectually stimulating and practically feasible for investigation.

PART V

9. Write a comprehensive note on the “ Task of defining a research problem”

- The problem to be investigated must be defined unambiguously for that will help to discriminate relevant data from the irrelevant ones.
- A proper definition of research problem will enable the researcher to be on the track whereas an ill-defined problem may create hurdles.
- Questions like:
 - What data are to be collected?
 - What characteristics of data are relevant and need to be studied?
 - What relations are to be explored.
 - What techniques are to be used for the purpose? andsimilar other questions crop up in the mind of the researcher who can well plan his strategy and find answers to all such questions only when the research problem has been well defined.

The following points must also be observed while defining a research problem:

- (a) **Technical terms** and words or phrases, with special meanings used in the statement of the problem, should be clearly defined.
- (b) Basic **assumptions** or postulates (if any) relating to the research problem should be clearly stated.
- (c) A straight forward statement of the **value of the investigation** (i.e., the criteria for the selection of the problem) should be provided.
- (d) The suitability of the **time-period** and the **sources of data available** must also be considered by the researcher in defining the problem.
- (e) The **scope of the investigation** or the limits within which the problem is to be studied must be mentioned explicitly in defining a research problem.

10. Describe fully the techniques of defining a research problem.

Technique Involved In Defining A Problem

- (i) Statement of the problem in a general way
- (ii) Understanding the nature of the problem
- (iii) Surveying the available literature
- (iv) Developing the ideas through discussions
- (v) Rephrasing the research problem

Statement of the problem in a general way:

This technique involves initially formulating the research problem in a broad or general manner. Researchers start by identifying a topic or area of interest and articulating a preliminary statement of the problem. This general statement serves as a starting point for further exploration and refinement. It provides an initial direction for the research process but may require further clarification and specificity.

Understanding the nature of the problem:

Once the problem is stated in a general way, researchers delve deeper into understanding the nature, context, and complexities of the problem. This involves analyzing the various dimensions, factors, and stakeholders involved in the problem. Researchers seek to gain a comprehensive understanding of the problem's background, causes, consequences, and implications. Understanding the nature of the problem helps researchers identify key issues to address and potential avenues for investigation.

Surveying the available literature:

Surveying the available literature is a crucial technique for defining a research problem. Researchers conduct a comprehensive review of existing literature related to the topic to identify gaps, controversies, or unanswered questions. By analyzing previous studies, researchers gain insights into what has already been studied, what remains unknown, and where opportunities for new research lie. Surveying the literature helps researchers refine their understanding of the problem and identify specific areas for further investigation.

Developing the ideas through discussions:

Developing ideas through discussions involves engaging in dialogue and collaboration with peers, colleagues, mentors, or subject matter experts. Researchers discuss their preliminary ideas, insights, and observations related to the research problem with others to gain different perspectives and feedback. Through discussions, researchers can explore alternative viewpoints, generate new ideas, and refine their understanding of the problem. Collaboration enhances creativity, critical thinking, and problem-solving skills, contributing to the refinement of the research problem.

Rephrasing the research problem:

Rephrasing the research problem is a technique for refining and clarifying the initial statement of the problem. Researchers revisit the preliminary statement of the problem and rephrase it to enhance clarity, specificity, and relevance. This may involve narrowing the focus, specifying key variables or concepts, or articulating the problem in a more precise and concise manner. Rephrasing the research problem ensures that it accurately reflects the researcher's objectives, interests, and the complexities of the problem being investigated.

These techniques work synergistically to help researchers define and refine research problems that are relevant, meaningful, and impactful within their field of study. By employing these techniques, researchers can systematically identify, analyze, and articulate research problems that serve as the foundation for rigorous and insightful research projects.