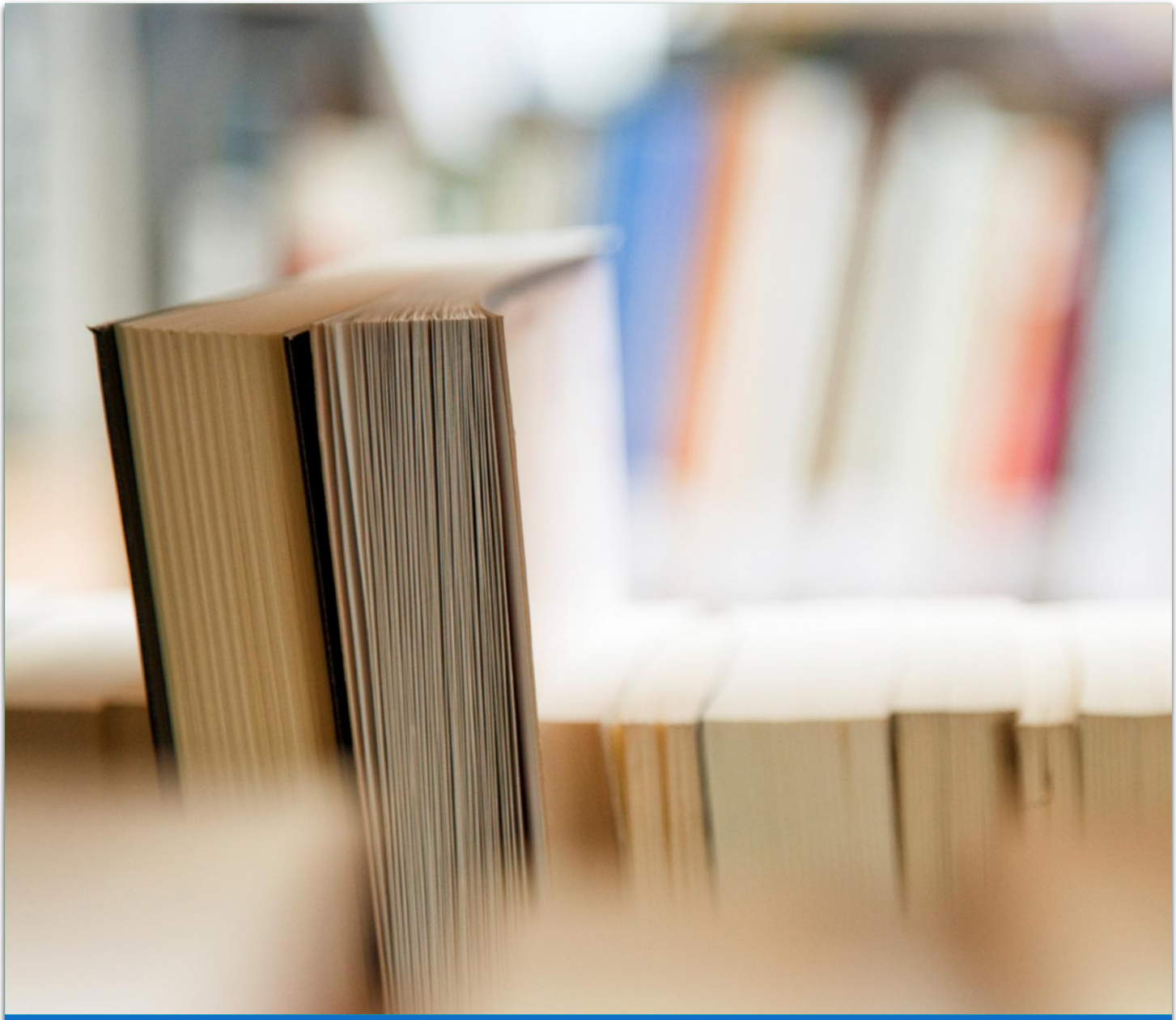

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Unit – 2: Research Aptitude

Sub Unit – 1: Meaning, Characteristics and Types of Research

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Unit – 2: Research Aptitude

Section – 1: At a Glance

Sub Unit – 1: Meaning, Characteristics and Types of Research

CONCEPT AND MEANING OF RESEARCH: The word research means 'to know' which consists of two words: 'Re' and 'Search'. 'Re' means again and again and 'Search' means to find out something.

DEFINITIONS OF RESEARCH: Different academicians/researchers give different definitions of research in the literature and form which some main definitions are introduced in the main text.

CHARACTERISTICS OF RESEARCH: Some terms are commonly used while describing research: Reliability, Validity, Accuracy, Credibility, Generalization, Empirical, Systematic, and Controlled. These are called as the characteristics of research.

OBJECTIVES OF RESEARCH: Objectives give direction to the research work. The information of objectives helps the individuals and teams to reach a common goal.

TYPES OF RESEARCH: Types of research can be classified into several categories according to the nature and purpose of the study and other attributes. Different types of research are: Descriptive Research, Ex- Post- Facto Research, Historical Research, Analytical Research, Correlational Research, Explanatory Research, Exploratory Research, Experimental Research, Fundamental Research, Applied Research, Action Research, Participatory Action Research, Deductive Research, Inductive Research, Quantitative Research, Qualitative Research, Structured Research, Unstructured Research, Conceptual Research, Empirical Research, and Interdisciplinary Research

Sub Unit – 2: Methods of Research

METHODS OF RESEARCH: A research method is a strategy used to implement that plan. The research method depends on what subjects (and who) you want to study.

EXPERIMENTAL METHOD: The experimental method is a matter of logic, not of location. It is oriented to the future in the sense that the researcher is seeking to evaluate something new.

OBSERVATIONAL METHOD: Observational research is defined as the method of viewing and recording the actions and behaviors of participants.

SURVEY METHOD: Survey method is concerned with the present attempts to determine the status of the phenomena under investigation.

CASE STUDIES: Case study is a research methodology, typically seen in social and life sciences. It has been described as an intensive, systematic investigation of a single individual, group, community or some other unit in which the researcher examines in-depth data relating to several variables.

TEST METHOD: Test method is used to measure all kinds of abilities, interests, attitudes and accomplishments. A test essentially presents a uniform situation to a group of people who vary in aspects relevant to the situation.

Sub Unit – 3: Steps of Research

STEPS OF RESEARCH / PROCESS OF RESEARCH: The scientific research process is a multiple-step process where the steps are interlinked with the other steps in the process. The steps of a scientific research are: Identification of the research problem, Formulation of the objectives, Formulation of the questionnaire, Extensive Review of the literature, Formulation of the hypothesis, Design research (including sample design), Collection of the Data, Analysis of the Data (Test hypothesis if any), Interpretation and report writing, Bibliographical Information

IDENTIFICATION OF THE RESEARCH PROBLEM: Initially the problem is stated in a broad general way and then the ambiguities, if any, relating to the problem be resolved. Two steps are essential in formulating the research problem: understanding the problem thoroughly, and rephrasing the same into meaningful terms from an analytical point of view.

FORMULATION OF OBJECTIVES: Objectives are the goals you set out to attain in your study.

FORMULATION OF QUESTIONNAIRE: Questionnaires are an important tool for research work and for designing a good questionnaire the following points should kept in mind: writing primary and secondary aims of the study, review of the literature, prepare a draft of questionnaire, and revision of the draft.

EXTENSIVE LITERATURE REVIEW: The researcher should undertake extensive literature survey connected with the problem. In this process, it should be remembered that one source will lead to another. The earlier studies, if any, which are similar to the study in hand, should be carefully studied.

FORMULATING HYPOTHESIS: Working hypothesis is tentative assumption made in order to draw out and test its logical or empirical consequences. Researchers will have one or more hypothesis.

PREPARING RESEARCH DESIGN: To formulate the research problem clearly, the researchers have to prepare a research design that will help the conceptual structure.

SAMPLING: Sampling is a tool that enables us to draw conclusions about the characteristics of the populations. A finite subset of the population, selected from it with the objective of investigating its properties is called sample and the number of unites in the sample is known as the sample size.

PROBABILITY SAMPLING: A probability sample is a sample in which every unit in the population has a chance (greater than zero) of being selected in the sample, and this probability can be accurately determined.

NON PROBABILITY SAMPLING: Non probability sampling is any sampling method where some elements of the population have no chance of selection or where the probability of selection can't be accurately determined.

SIMPLE RANDOM SAMPLING: It is the techniques in which sample is so drawn that each and every unit in the population has an equal and independent chance of being included in the sample.

SYSTEMATIC SAMPLING: Systematic sampling is slight variation of the simple random sampling in which only the first sample unit is selected at random and the remaining units are automatically selected in a definite sequence at equal spacing from one another.

STRATIFIED SAMPLING: Population is heterogeneous in nature with respect to the variable or characteristic.

CLUSTER SAMPLING: Total population is divided into some recognizable subdivisions depending on the problem under study and a simple random sample of these clusters is drawn, are termed as clusters.

QUOTA SAMPLING: The population is first segmented into mutually exclusive sub-groups, just as in stratified sampling, and then judgment is used to select the subjects or units from each segment based on a specified proportion.

MULTISTAGE SAMPLING: Multistage sampling refers to a sampling technique which is carried out in various stages.

PURPOSIVE SAMPLING: A sample which is selected on the basis of individual judgment of the sampler is called purposive Sampling.

SAMPLING ERROR: Sampling is typically done to determine the characteristics of a whole population; the difference between the sample and population values is considered a sampling error. Sampling error decreases with the increase in sample size and it increases with the decrease in sample size.

NON-SAMPLING ERROR: Non-sampling errors are other errors which can impact the final survey estimates, caused by problems in data collection, processing, or sample design.

STANDARD ERROR: It is the standard deviation of the sampling distribution of a statistic, most commonly of the mean. The term may also be used to refer to an estimate of that standard deviation, derived from a particular sample used to compute the estimate.

SKEWNESS: By skewness of a frequency distribution we mean the degree of its departure from symmetry.

KURTOSIS: Another method of describing a frequency distribution is to specify its degree of peakedness or kurtosis. The importance of describing kurtosis is that, two distributions may have the same mean and the same standard deviation and may be equally skew, but one of them may be more peaked than the other.

PRIMARY DATA: Primary data (also known as raw data) is a term for data collected directly from field.

SECONDARY DATA: Secondary data are such numerical information which have previously been collected by someone other than the user or by some agency for one purpose and are merely compiled from that source for use in a different connection.

CROSS SECTION DATA: Cross-sectional data or a cross section of a study population, in statistics is a type of data collected by observing many subjects at the same point of time or without regard to differences in time.

TIME SERIES DATA: A series of observations recorded in accordance with the time of occurrence is called time series.

PANEL DATA: The term panel data refers to data sets where we have data on the same individual over several periods of time.

QUANTITATIVE DATA: Quantitative data, as the name suggests is one which deals with quantity or numbers.

QUALITATIVE DATA: Qualitative data refers to the data that provides insights and understanding about a particular problem. It can be approximated but cannot be computed.

ANALYSIS OF DATA: After the data have been collected from different sources, the researcher turns to the task of analyzing them. The data collected are to be discussed vividly. So the researcher classifies the data for study in two categories: descriptive analysis and statistical analysis.

HYPOTHESIS TESTING: A statistical hypothesis is a scientific hypothesis that is testable on the basis of observing a process that is modeled via a set of random variables. A statistical hypothesis test is a method of statistical inference used for testing a statistical hypothesis.

GENERALIZATIONS AND INTERPRETATION: If a hypothesis is tested and upheld several times, it may be possible for the researcher to arrive at generalization, i.e. to build a theory.

BIBLIOGRAPHIC INFORMATION: Bibliography given in a research reporthelps those interested in further research.

Sub Unit – 4: Thesis and Article Writing

RESEARCH PAPER: A research paper is a piece of academic writing based on its author's original research on a particular topic, and the analysis and interpretation of the research findings.

ARTICLE: Article is a write-up like that of a research paper and is not bound by the methodology adopted in research paper.

WORKSHOP: A place where things are made or repaired, a class or series of classes in which a small group of people learn the methods and skills used in doing something.

SEMINAR: A seminar is a form of academic instruction, either at an academic institution or offered by a commercial or professional organization.

SYMPOSIUM: A symposium is generally defined as a meeting organized so that experts in a given field can meet, present papers, and discuss issues and trends or make recommendations for a certain course of action.

Sub Unit – 5: Application of ICT in Research

CONCEPT OF INFORMATION AND COMMUNICATION TECHNOLOGY: Information and Communication Technologies (ICTs) are referred to as the varied collection of technological gear and resources which are made use of to communicate. They are also made use of to generate, distribute, collect and administer information. It consists of the hardware, software, networks, and media for collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services.

ICT IN RESEARCH: Applications of ICTs are particularly powerful and uncontroversial in higher education's research function. Four areas are particularly important: (i) The steady increases in bandwidth and computing power available have made it possible to conduct complex calculations on large data sets. (ii) Communication links make it possible for research teams to be spread across the world instead of concentrated in a single institution. (iii) The combination of communications and digital libraries is equalizing access to academic resources, greatly enriching research possibilities for smaller institutions and those outside the big cities. (iv) Taking full advantage of these trends to create new dynamics in research requires national policies for ICTs in higher education and the establishment of joint information systems linking all higher education institutions.

BENEFITS OF ICT IN RESEARCH: Information and communication Technology provides three types of benefits viz. General Benefits, Benefits for Pupils, and Benefits for Teachers

FACTORS FOR EFFECTIVE USE: Preparation in advance is critical when using the internet for historical research, ICT use in history teaching is most beneficial when coupled with effective teacher intervention, to ensure pupils learn at a good pace and can concentrate on the history rather than aspects of the

ICT, Pupils need to be taught how to interpret information and make judgments and inferences about it, in order to make historical research using electronic sources more effective, and when using a word processor to investigate a text, teachers must ensure the activity encourages effective comprehension of the content, and that it is not only a mechanical reading or cutting and pasting activity.

EFFECTS OF ICT ON RESEARCH: ICT had effects on many facets of social science research. They can be classified into three categories which include: a) ICT application in pre-data analysis, b) ICT application in data analysis, and c) ICT application in post data analysis.

ICT application in pre-data analysis refers to examples how ICTs are applied on activities of social science research before reaching the stage of data analysis.

Sub Unit – 6: Research Ethics

RESEARCH ETHICS: Ethical norms are so ubiquitous that one might be tempted to regard them as simple common sense.

COMPONENTS OF ETHICAL RESEARCH: Fabrication, Falsification, Plagiarism and differences of opinion

REASONS: There are several reasons why it is important to adhere to ethical norms of research: Honesty, Objectivity, Integrity, Carefulness, Openness, Respect for Intellectual Property, Confidentiality, Responsible Publication, Responsible Mentoring, Respect for Colleagues, Social Responsibility, Non-Discrimination, Competence, Legality, Animal Care, Human Subjects Protection.

Section – 2: Key Statements

Every candidate appearing for NET/SET examination should follow these key (main) points those can help them a better understanding regarding this unit very quickly.

Key Statements:

Concept and Meaning of Research (1); Definitions of Research (2); Characteristics of Research (3); Objectives of Research (4); Types of Research (5): Descriptive Research (6), Ex-Post-Facto Research (7), Historical Research (8), Analytical Research (9), Correlational Research (10), Explanatory Research (11), Exploratory Research (12), Experimental Research (13), Fundamental Research (14), Applied Research (15), Deductive Research (16), Inductive Research (17), Quantitative Research (18), Qualitative Research (19), Structured Research (20), Unstructured Research (21), Conceptual Research (22), Empirical Research (23), Interdisciplinary Research (24); Methods of Research (25): Experimental Method (25.1), Observational Method (25.2), Survey Method (25.3), Case Studies (25.4), Test Method (25.5); Steps of Research (26); Research Paper (27): Concept (27.1), Purpose (27.2), Feature (27.3), Forms (27.4), Evaluation (27.5); Article (28): Concept (28.1), Forms (28.2), Importance (28.3); Workshop (29): Concept (29.1), Scope (29.2); Seminar (30): Concept (30.1), Objectives (30.2) – Cognitive Objective (30.2.a); Conference (31): Concept (31.1), Objectives (31.2) – Cognitive Objective (31.2.a), Affective Objective (31.2.b); Symposium (32): Concept (32.1), Objectives (32.2); Report Writing (33): General Guidelines (33.1), Outlines (33.2), Analysis and Presentation of Results (33.2.b); Thesis (34): Characteristics (34.1), Benefits (34.2), Considerations (34.3), Format (34.4): Preliminary Section (34.4.1) , Main Body (34.4.2), References (34.4.3); ICT (35): ICT in Research (36); Benefits (37); Factors for Effective Use (38); Effects on Research (39); Research Ethics (40): Components (40.1), Reasons (40.2)

[N.B. – Numbers in parenthesis are the reference number]

Section – 3: Key Facts and Figures

Sub Unit – 1: Meaning, Characteristics and Types of Research

1. Concept and Meaning of Research

The word 'research' means the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusion.

Some of the important ways of knowing are as under:

(i) Consecutive, authoritarian, ideology, legal precedent, universal truth, myths

(ii) Reason, formal logic

(iii) Affect, intuition, intra-personal processes and common sense

(iv) Altered consciousness, revelation, graces

(v) Empirical research

The term 'Research' consists of two words –

Research = Re + Search 'Re' means again and again and 'Search' means to find out something. Research is a process of which a person observes the phenomena again and again and collects the data and on the basis of data he draws some conclusions. Research is conducted by a person who possesses new thinking and has reasoning ability.

2. Definitions of Research

J. W. Best: "Research is considered to be the more formal, systematic, intensive process of carrying on the scientific methods of analysis. It involves a more systematic structure of investigation, usually resulting in some sort of formal record of procedures and report of results or conclusions".

C. C. Crawford: "Research is simply a systematic and refined technique of thinking employing specialized tools, instruments and procedures in order to obtain a more adequate solution of a problem, collect data or facts, analyze these critically and reach at decisions based on the actual evidence. It involves original work instead of mere exercise of personal experiences. It evolves from a genuine desire to know rather than a desire to prove something, it is quantitative, seeking to know not only what but how much, and measurement is therefore, a central feature of it".

Random Morey: "Research is an honest, exhaustive, intelligent searching for facts and their meanings or implication with reference to a given problem. The product or findings of given piece of research should be an authentic, verifiable and contribution to knowledge in the field studies".

3. Characteristics of Research

Certain terms are very commonly used in research and the success of any research depends on the terms. These terms determine whether a research is free of biases, prejudices, and subjective errors or not. They are called the characteristics of research.

(i) Research is a scientific investigation which means to 'search again and again'.

(ii) Research originates with a question or problem.

(iii) Research requires clear articulation of a goal.

(iv) Research usually divides the principal problem into more manageable sub-problems.

(v) Research is guided by the specific research problem, question, or hypothesis.
(vi) It develops some new concepts and theories and expands the limits of knowledge.
(vii) It cannot be implemented immediately. It does not directly involve the solution to a particular problem; its findings generally cannot be implemented immediately.

4. Objectives of Research

The objective of research project summarizes what is to be achieved by the study. The research objectives are the specific accomplishments the researcher hopes to achieve by the study. A clearly defined research objective will help the researcher to focus on the study. The formation of objectives helps the individuals and teams to reach to a common goal:

(i) To become familiar with a phenomenon on to achieve new insights into it.
(ii) To encode precisely the characteristics of a particular individual situation or a group.
(iii) To determine the frequency with which something occurs or with it is associated with something else.
(iv) To test a hypothesis of a causal relationship between them.
(v) To systematically examine and critically analyze the investigations sources with objectivity.
(vi) To discover new things.
(vii) To keep pace with the advancement in knowledge.
(viii) To find out the depth of research.
(ix) To select the problem from the point of social relevance.

5. Types of Research

Types of research can be classified into several categories according to the nature and purpose of the study and other attributes.

1. **On the basis of Objectives:** Descriptive Research, Correlational Research, Explanatory Research, Exploratory Research, Experimental Research
2. **On the basis of Outcomes:** Fundamental Research, Applied Research
3. **On the basis of Logic:** Deductive Research, Inductive Research
4. **On the basis of Process:** Quantitative Research, Qualitative Research
5. **On the basis of Inquiry mode:** Structured Research Unstructured Research
6. **On the basis of Idea or Concept:** Conceptual Research, Empirical Research

6. Descriptive Research

(i) Descriptive research is used to describe characteristics of a population or phenomenon being studied. It does not answer questions about how/when/why the characteristics occurred. Rather it addresses the "what" question (what are the characteristics of the population or situation being studied?). The characteristics used to describe the situation or populations are usually some kind of categorical scheme also known as descriptive categories.

(ii) Descriptive research cannot be used as the basis of a causal relationship, where one variable affects another. In other words, descriptive research can be said to have a low requirement for internal validity.

(iii) The description is used for frequencies, averages and other statistical calculations. Often the best approach, prior to writing descriptive research, is to conduct a survey investigation. Qualitative research often has the aim of description and researchers may follow-up with examinations of why the observations exist and what the implications of the findings are.

7. Ex Post Facto Research

An ex-post-facto research is a method in which groups with qualities that already exist are compared on some dependent variable. Also known as "after the fact" research, an ex-post-facto design is considered quasi-experimental because the subjects are not randomly assigned; they are grouped based on a particular characteristic or trait. Although differing groups are analyzed and compared in regards to independent and dependent variables it is not a true experiment because it lacks random assignment. The assignment of subjects to different groups is based on whichever variable is of interest to the researchers.

(i) It is used in social sciences and business organizations.

(ii) It is conducted in context of a phenomenon after it has occurred or at the time of its occurrence.

(iii) It basically deals with non-manipulated variables of a phenomenon.

8. Historical Research

(i) Historical research is a qualitative technique.

(ii) Historical research studies the meaning of past events in an attempt to interpret the facts and explain the cause of events, and their effect in the present events.

(iii) In doing so, researchers rely heavily on primary historical data (direct accounts of events, archival data - official documents, personal records, and records of eyewitnesses) and less frequently on secondary historical data (information from persons who didn't witness the event; e.g. textbooks, newspapers, encyclopedias).

(iv) Historical research data is subject to external criticism (verification of genuineness or validity of the source) and internal criticism (exploring the meaning of the source).

(v) Historical research has time and place dimensions.

(vi) Simple chronology is not considered historical research because it does not interpret the meaning of events.

9. Analytical Research

The distinction between descriptive and analytical research is based on the question it asks. Descriptive research attempts to determine, describe, or identify what is, while analytical research attempts to establish why it is that way or how it came to be.

(i) In this method, the researcher uses facts or information already available.

(ii) It attempts to make critical evaluation of the material.

10. Correlational Research

(i) Correlational research is a type of non-experimental research method, in which a researcher measures two variables, understands and assesses the statistical relationship between them with no influence from any extraneous variable.

(ii) It is looking for variables that seem to interact with each other so that when you see one variable changing, you have a fair idea how the other variable will change.

Example: The correlation between two variables is shown through correlation coefficient (A correlation coefficient is a statistical measure that calculates the strength of the relationship between two variables), that is a value measured between -1 and +1. When the correlation coefficient is close to +1 then there is a positive correlation between the two variables and the value is close to -1, then there is a negative correlation between the two variables and when the value is close to zero then there is no relationship between the two variables.

11. Explanatory Research

(i) Explanatory Research is conducted for a problem which was not well researched before, demands priorities, generates operational definitions and provides a better-researched model.

(ii) It is actually a type of research design which focuses on explaining the aspects of your study in a detailed manner.

(iii) The researcher starts with a general idea and uses research as a tool which could lead to the subjects that would be dealt with in the incoming future.

(iv) It is meant to provide details where a small amount of information exists for a certain product in mind of that researcher.

(v) It is conducted in order to help us find the problem that was not studied before in-depth.

(vi) It is not used to give us some conclusive evidence but helps us in understanding the problem more efficiently. When conducting the research, the researcher should be able to adapt himself/herself to the new data and the new insight that he discovers as he/she studies the subject.

12. Exploratory Research

(i) It is generally done in the beginning of a research. It is undertaken to explore an area where little is known or to investigate the possibilities of undertaking a particular research study and is akin to feasibility study or pilot study.

(ii) It attempts to clarify why and how there is a relationship between two or more aspects of a situation or phenomenon.

(iii) The purpose of exploratory research is to gain background information, to define terms, to clarify the problems, to develop hypothesis, to establish research priorities and objectives, and to develop questions to be answered.

(iv) It makes use of secondary data (mainly literature review), experience surveys, case studies, interviews (mainly focus groups' interviews) and projective techniques.

13. Experimental Research

(i) Experimental research is any research conducted with a scientific approach, where a set of variables are kept constant while the other set of variables are being measured as the subject of experiment.

(ii) It is important for an experimental research to establish cause and effect of a phenomenon, which means, it should be definite that effects observed from an experiment are due to the cause.

(iii) As naturally, occurring event can be confusing for researchers to establish conclusions. For instance, if a cardiology student conducts research to understand the effect of food on cholesterol and derives that most heart patients are non-vegetarians or have diabetes. They are aspects (causes) which can result in a heart attack (effect).

Example: The simplest example of an experimental research is conducting a laboratory test. As long as research is being conducted under scientifically acceptable conditions – it qualifies as an experimental research. A true experimental research is considered to be successful only when the researcher confirms that a change in the dependent variable is solely due to the manipulation of the independent variable.

14. Fundamental Research

(i) Fundamental research, also known as basic research or pure research does not usually generate findings that have immediate applications in a practical level.

(ii) Fundamental research is driven by curiosity and the desire to expand knowledge in specific research area.

(iii) This type of research makes a specific contribution to the academic body of knowledge in the research area.

(iv) Fundamental studies tend to make generalizations about the phenomenon, and the philosophy of this type of studies can be explained as 'gathering knowledge for the sake of knowledge'. Fundamental researches mainly aim to answer the questions of why, what or how and they tend to contribute the pool of fundamental knowledge in the research area.

(v) Opposite to fundamental research is applied research that aims to solve specific problems; thus, findings of applied research do have immediate practical implications.

15. Applied Research

(i) Applied research is a methodology used to solve a specific, practical problem of an individual or group.

(ii) The study and research are used in business, medicine and education in order to find solutions that may cure diseases, solve scientific problems or develop technology.

Example: The following are examples for applied research. You can notice that each of these studies aim to resolve a specific and an immediate problem.

- A study into the ways of improving the levels of customer retention for Wall-Mart in China
- An investigation into the ways of improving employee motivation in Marriot Hotel, Hyde Park

- Development of strategies to introduce change in Starbucks global supply-chain management with the view on cost reduction
- A study into the ways of fostering creative deviance amongst employees without compromising respect for authority

15.1. Action Research:

(i) Action research refers to a wide variety of evaluative, investigative, and analytical research methods designed to diagnose problems or weaknesses – whether organizational, academic, or instructional – and help educators develop practical solutions to address them quickly and efficiently.

(ii) It may also be applied to programs or educational techniques that are not necessarily experiencing any problems, but that educators simply want to learn more about and improve. The general goal is to create a simple, practical, repeatable process of iterative learning, evaluation, and improvement that leads to increasingly better results for schools, teachers, or programs.

(iii) It may also be called a cycle of action or cycle of inquiry, since it typically follows a predefined process that is repeated over time.

Example:

- Identify a problem to be studied
- Collect data on the problem
- Organize, analyze, and interpret the data
- Develop a plan to address the problem
- Implement the plan
- Evaluate the results of the actions taken
- Identify a new problem
- Repeat the process

15.1.a. Participatory Action Research:

Participatory Action Research (PAR) is an approach to enquiry which has been used since the 1940s. It involves researchers and participants working together to understand a problematic situation and change it for the better. There are many definitions of the approach, which share some common elements. PAR focuses on social change that promotes democracy and challenges inequality; is context-specific, often targeted on the needs of a particular group; is an iterative cycle of research, action and reflection; and often seeks to 'liberate' participants to have a greater awareness of their situation in order to take action. PAR uses a range of different methods, both qualitative and quantitative.

15.1.b. Usual Sequence of Action Research:

In doing action research, the usual sequence of steps is as followed:

(i) Plan
(ii) Act
(iii) Observe
(iv) Reflect

16. Deductive Research

(i) A deductive approach is concerned with "developing a hypothesis (or hypotheses) based on existing theory, and then designing a research strategy to test the hypothesis".

(ii) It has been stated that "deductive means reasoning from the particular to the general. If a causal relationship or link seems to be implied by a particular theory or case example, it might be true in many cases.

(iii) A deductive design might test to see if this relationship or link did obtain on more general circumstances".

(iv) It can be explained by the means of hypotheses, which can be derived from the propositions of the theory. In other words, deductive approach is concerned with deducting conclusions from premises or propositions.

(v) Deduction begins with an expected pattern "that is tested against observations, whereas induction begins with observations and seeks to find a pattern within them".

Example:

1. All men are mortal (general fact, applies to all men).
2. Socrates is a man.
3. (Therefore,) Socrates is mortal (specific).

17. Inductive Research

(i) Inductive approach, also known as inductive reasoning, starts with the observations and theories are proposed towards the end of the research process as a result of observations.

(ii) It involves the search for pattern from observation and the development of explanations – theories – for those patterns through series of hypotheses.

(iii) No theories or hypotheses would apply in inductive studies at the beginning of the research and the researcher is free in terms of altering the direction for the study after the research process had commenced.

(iv) It is important to stress that inductive approach does not imply disregarding theories when formulating research questions and objectives.

(v) This approach aims to generate meanings from the data set collected in order to identify patterns and relationships to build a theory; however, inductive approach does not prevent the researcher from using existing theory to formulate the research question to be explored.

(vi) It is based on learning from experience. Patterns, resemblances and regularities in experience (premises) are observed in order to reach conclusions (or to generate theory).

Example:

(i) Socrates is mortal (specific).
(ii) Alexander is mortal (specific), Pluto is mortal, and so (specific).
(iii) All men are mortal (general).

18. Quantitative Research

Quantitative research emphasizes objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, questionnaires, and surveys, or by manipulating pre-existing statistical data using computational techniques. Quantitative research focuses on gathering numerical data and generalizing it across groups of people or to explain a particular phenomenon.

Characteristics:

(i) The data is usually gathered using structured research instruments.
(ii) The results are based on larger sample sizes that are representative of the population.
(iii) The research study can usually be replicated or repeated, given its high reliability.
(iv) Researcher has a clearly defined research question to which objective answers are sought.
(v) All aspects of the study are carefully designed before data is collected.
(vi) Data are in the form of numbers and statistics, often arranged in tables, charts, figures, or other non-textual forms.
(vii) Project can be used to generalize concepts more widely, predict future results, or investigate causal relationships.
(viii) Researcher uses tools, such as questionnaires or computer software, to collect numerical data.

19. Qualitative Research

(i) Qualitative Research is primarily exploratory research.
(ii) It is used to gain an understanding of underlying reasons, opinions, and motivations.
(iii) It provides insights into the problem or helps to develop ideas or hypotheses for potential quantitative research.
(iv) It is also used to uncover trends in thought and opinions, and dive deeper into the problem.
(v) Some common methods include focus groups (group discussions), individual interviews, and participation/observations.
(vi) The sample size is typically small, and respondents are selected to fulfill a given quota.

19.1. Qualitative research is appropriate when:

(i) The intended research area is not well studied or understood.
(ii) A subject need to be studied in depth.
(iii) A holistic perspective is needed.
(iv) Behavioral aspects of people need to be studied.
(v) Management techniques like questionnaires are not considered suitable.
(vi) A researcher is more interested in the process (how it works) and not the product (the outcome).

20. Structured Research

A structured research (also known as a standardized interview or a researcher-administered survey) is a quantitative research method commonly employed in survey research. The aim of this approach is to ensure that each interview is presented with exactly the same questions in the same order.

21. Unstructured Research

The chief feature of the unstructured research is the idea of probing questions that are designed to be as open as possible. It is a qualitative research method and accordingly prioritizes validity and the depth of the interviewees' answers.

22. Conceptual Research

Conceptual Research is defined as a methodology wherein research is conducted by observing and analyzing already present information on a given topic. Conceptual research doesn't involve conducting any practical experiments. It is related to abstract concepts or ideas.

23. Empirical Research

Empirical research is based on observed and measured phenomena and derives knowledge from actual experience rather than from theory or belief.

Characteristics:

(i) Specific research questions to be answered.
(ii) Definition of the population, behavior, or phenomena being studied.
(iii) Description of the process used to study this population or phenomena, including selection criteria, controls, and testing instruments (such as surveys).

24.Interdisciplinary Research

The definition of a "discipline" and discussions of the varieties of interdisciplinary, multidisciplinary, and trans-disciplinary research have occupied much scholarly debate. Although there is not always agreement on these definitions, it is clear that areas of research are dynamic - continually emerging, melding, and transforming. As a working definition of interdisciplinary research, we refer you to the definition set forth in a National Academies' report: "Interdisciplinary research is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice."

Sub Unit – 2: Methods of Research

25.Methods of Research

A research method is a strategy used to implement that plan. Research design and research methods are different but closely related; because good research design ensures that the data you obtain will help you answer your research questions more effectively.

The most important questions in research are which method you should be chosen. It depends on what subjects (and who) you want to study.

25.1. Experimental Method [Scientific Method]:

The prime method of inquiry in science is the experiment. The key features are control over variables, careful measurement, and establishing cause and effect relationships.

An experiment is an investigation in which a hypothesis is scientifically tested. In an experiment, an independent variable (the cause) is manipulated and the dependent variable (the effect) is measured; any extraneous variables are controlled.

An advantage is that experiments should be objective. The views and opinions of the researcher should not affect the results of a study. This is good as it makes the data more valid, and less bias.

There are three types of experiments you need to know:

1. Laboratory / Controlled Experiments

This type of experiment is conducted in a well-controlled environment (not necessarily a laboratory), where accurate measurements are possible. The researcher decides where the experiment will take place, at what time, with which participants, in what circumstances and using a standardized procedure. Participants are randomly allocated to each independent variable group.

(i) Strength: It is easier to replicate (i.e. copy) a laboratory experiment. This is because a standardized procedure is used. They allow for precise control of extraneous and independent variables. This allows a cause and effect relationship to be established.

(ii) Limitation: The artificiality of the setting may produce unnatural behavior that does not reflect real life, i.e. low ecological validity. This means it would not be possible to generalize the findings to a real-life setting. Demand characteristics or experimenter effects may bias the results and become confounding variables.

2. Field Experiments

Field experiments are done in the everyday (i.e. real life) environment of the participants. The experimenter still manipulates the independent variable, but in a real-life setting (so cannot really control extraneous variables).

(i) Strength: Behavior in a field experiment is more likely to reflect real life because of its natural setting, i.e. higher ecological validity than a lab experiment. There is less likelihood of demand characteristics affecting the results, as participants may not know they are being studied. This occurs when the study is covert.

(ii) Limitation: There is less control over extraneous variables that might bias the results. This makes it difficult for another researcher to replicate the study in exactly the same way.

3. Natural Experiments

Natural experiments are conducted in the everyday (i.e. real life) environment of the participants, but here the experimenter has no control over the IV as it occurs naturally in real life.

(i) Strength: Behavior in a natural experiment is more likely to reflect real life because of its natural setting, i.e. very high ecological validity. There is less likelihood of demand characteristics affecting the results, as participants may not know they are being studied. Can be used in situations in which it would be ethically unacceptable to manipulate the independent variable, e.g. researching stress.

(ii) Limitation: They may be more expensive and time consuming than lab experiments. There is no control over extraneous variables that might bias the results. This makes it difficult for another researcher to replicate the study in exactly the same way.

25.1.a. Characteristics of a Good Experimental Method:

The characteristics of a good experimental method are classified into two categories:

1. General characteristics of experimental method –

(i) Unbiased estimation of true effect.
(ii) Precision of the estimates with a quantitative index.
(iii) The testing of clear specific hypothesis of different intention etc.
(iv) Efficiency in the sense of securing maximum results at minimum.

2. Specific characteristics of experimental method –

(i) It emphasizes objectivity and accuracy in the collection of the data and treatment part of it.
(ii) It emphasizes control of conditions and the experimentation of certain variables in controlled conditions.
(iii) It sets out the relationship between the phenomenon and this relationship is more or less of the causal type.
(iv) It eliminates spurious relations between variables or factors.
(v) It uses standardized tool for experimentation and makes the evidences very much objective.
(vi) The sample is selected with great precaution and every care is taken to safeguard extraneous factors.
(vii) It leads to the testing of a specific hypothesis and experimental evidences so called as to reject or retain the hypothesis.
(viii) The laws, postulates and theories of education are developed mostly through experimental methods. It allows for precision and exactness in the findings and their analysis and treatment, through measurement. The hypotheses is rejected or retained. Measurement is done through standardized test and tools of research.

25.2. Observational Method:

Observational research is defined as the method of viewing and recording the actions and behaviors of participants. It is described as being a systematic observation method, which implies that the observation techniques are sensible and replicable procedures so that the research could be reproduced. As the name describes, "observational" methods are all about observing the participants. There is no experiment conducted and no variables are

manipulated. The observations are made without disturbing, influencing or altering the environment or the participants in any way. Researchers simply use all of their senses to observe participants in either a natural setting or a naturally occurring situation.

There are a variety of reasons that observational research is chosen as the most appropriate method of collecting data for a particular research question.

Following is a list of some of those reasons and situations:

(i) If research question is attempting to question of "how" or "what type".

(ii) When it is important that the research take place in a natural setting so the phenomenon or behavior is not influenced or disturbed in any way.

(iii) When it is important to understand the setting that the observation is taking place in and how that may play a role in the results.

(iv) If a topic has not been previously studied and little is known, it may be best to begin with observation in a natural setting. This may provide the foundation for further study and hypothesis development in the future.

(v) The actual behavior of the participants has the potential to be different from what those individuals might report if they were asked.

25.2. a. Types of Observations:

There are three main types of observational methods based primarily on the extent to which the researcher controls or interacts with the environment. The following list describes the three methods and provides an example of each.

(i) **Naturalistic Observation:** This method takes place in the natural, every day setting of the participants. In naturalistic observation, there is no intervention by the researcher. This type of observational method is sometimes referred to nonparticipant observation. In fact, the researcher typically attempts to carry out the observations without the knowledge of the participants.

(ii) **Participant Observation:** In participant observation, the researcher intervenes in the environment in some manner. Typically, the researcher will insert himself/herself in to the group as a member of the group. This is done to be able to observe behaviors that may otherwise not be accessible to the researcher. The observations can either be covert or overt.

(iii) **Controlled Observation:** This type of observational method is carried out under controlled, arranged conditions, often in a laboratory setting. Controlled observations are overt as the researcher will explain the purpose of the research and the participants know they are being observed. Each test subject is exposed to the same situation in order to examine differences between individual reactions.

25.3. Survey Method:

The Survey method is the technique of gathering data by asking questions to people who are thought to have desired information. A formal list of questionnaires is prepared. Generally, a non-disguised approach is used in this method. The respondents are asked questions on their demographic interest opinion.

25.3. a. Categories of Survey Method:

This method is classified into four categories:
Descriptive Survey
Analytical Survey
School Survey
Genetic Survey

1. **Descriptive Survey:**

(i) Survey testing method
(ii) Questionnaire survey method
(iii) Interview survey method

2. **Analytical Survey:**

(i) Documentary survey
(ii) Observational survey
(iii) Rating survey
(iv) Critical incident
(v) Factor analysis

Sometimes, observation method is supplemented with survey method. This approach is most suited for gathering descriptive information, and this research may be direct or indirect. It is of two types: structured and unstructured surveys.

1. **Structured Surveys:** They use formal lists of questions to be asked from all respondents in the same manner.
2. **Unstructured Surveys:** They give the interviewer the flexibility to probe respondents and direct the interview according to their answers.

25.3. b. Information which the Survey Method collects:

The survey methods or survey studies collect the following three types of information:

(i) What exists
(ii) What we want
(iii) What to get there

The information of what exists is gathered by studying and analyzing important aspects of present situation.
The information of what we want is obtained by clarifying goods, goals, and objectives possibly through a study of the conditions existing elsewhere or what experts consider to be desirable.
The information of how to get these is collected through discovering the possible means of achieving the goals on the basis of the experience of others or of opinions of experts.

25.3. c. Advantages:

(i) Quick and low cost in comparison to observation method.
(ii) Survey method can be administered to collect many different types of information.

25.4. Case Studies:

In the social sciences and life sciences, a case study is a research method involving an up-close, in-depth, and detailed examination of a subject of study (the case), as well as its related contextual conditions.

Case studies can be produced by following a formal research method. These case studies are likely to appear in formal research venues, as journals and professional conferences, rather than popular works. The resulting body of 'case study research' has long had a prominent place in many disciplines and professions, ranging from psychology, anthropology, sociology, and political science to education, clinical science, social work, and administrative science.

25.4. a. Characteristics of a Good Case Study:

(i) It should be based on adequate and complete data.
(ii) Its data should be valid.
(iii) It should have continuity about it.
(iv) Its records should be kept confidential.
(v) Its data should be specifically synthesized and this synthesis should be as much prognostic as diagnostic.
(vi) Its follow up work should be undertaken.

25.4. b. Objectives of Case Study:

The case study has the following four main objectives:

(i) Clinical purpose (dealing with a patient)
(ii) Diagnostic purpose (educational situation to provide the remedial instruction to poor students)
(iii) Facts findings, about psychological or educational problems
(iv) Supplementing other information. It may be a follow up work.

25.4. c. Phases of Case Study:

A case study is conducted into three phases:

(i) Retrospective phase refers to the past records of the case completely which is used in diagnosing the case.
(ii) Prospective phase refers to the present status of the case, which is helpful in understanding the case. The suggestions and remediation can be offered to the case.
(iii) Consecutive phase refers to the future development and improvement of the case which is also employed to examine the effects of the remediation given to the case.

25.4. d. Types of Case Study:

Six types of case studies are conducted which are as follows:

(i) A group or community case study.
(ii) Causal comparative ca studies.
(iii) Activity analysis.
(iv) Content or document analysis.
(v) A follow up study.
(vi) Trend studies.

25.5. Test Method:

A test method is a method for a test in science or engineering, such as a physical test, chemical test, or statistical test. It is a definitive procedure that produces a test result. In order to ensure accurate and relevant test results, a test method should be "explicit, unambiguous, and experimentally feasible", as well as effective and reproducible.

A test can be considered an observation or experiment that determines one or more characteristics of a given sample, product, process, or service. The purpose of testing involves a prior determination of expected observation and a comparison of that expectation to what one actually observes. The results of testing can be qualitative (yes/no), quantitative (a measured value), or categorical and can be derived from personal observation or the output of a precision measuring instrument.

Usually the test result is the dependent variable, the measured response based on the particular conditions of the test or the level of the independent variable. Some tests, however, may involve changing the independent variable to determine the level at which a certain response occurs: in this case, the test result is the independent variable.

Previous Year Questions Analysis with Explanation

Sub Unit -1

1. Which of the following is NOT the characteristic of a research?

A. Research is systematic
B. Research is not a process
C. Research is problem oriented
D. Research is not passive

Answer: B

Explanation:

Research is a scientific process in which a researcher has to propound certain hypothesis, collect and analyze data and finally has to establish his proposition. So, research is a scientific and systematic process consisting of different steps and methods. So, the statement mentioned in the option B is not true.

2. Which of the following statement is correct?

A. Discoveries are researches
B. Research lead to discovery
C. Invention and Research are related
D. None of the above

Answer: B

Explanation:

The very etymology of the word 'Research' means searching anything again and again. Research is careful investigation or inquiry specially to search for new facts in any branch of knowledge. So, research leads to new ideas and innovation. The basic objective of the research is to rediscover existing ideas to explore new probabilities.

3. Which of the following statement is correct?

A. In research, objectives can be worded in question for m
B. In research, objectives can be worded in statement form
C. Objectives are to be stated in Chapter I of the Thesis
D. All the above

Answer: D

Explanation:

All the statements are correct because in research objective can be propounded both in the question and statement form. Research mainly exposes to exploration of new ideas and theories so it can be both in question or statement format. Objective is essential for research because without objective research is aimless. So, all the statements are correct.

4. One of the following is not a quality of researcher:

A. Unison with that of which he is in search
B. He must be of alert mind
C. Keenness in enquiry
D. His assertion to outstrip the evidence

Answer: D

Explanation: A good researcher must be always alert about what he is searching in his research. For this s/he needs to be with inquisitive bend of mind and keenness to find. A researcher presents his assertion with evidence and data. Going beyond data and moving from the proposition is not the quality of good researcher.

5. A satisfactory statistical quantitative method should not possess one of the following qualities:

A. Appropriateness
B. Measurability
C. Comparability.
D. Flexibility

Answer: D

Explanation: The statistical quantitative approach is especially useful for addressing specific questions about relatively well-defined phenomena. Quantitative analysis requires high-quality data in which variables are measured well (meaning the values of the variables must accurately represent differences in the characteristics of interest); this can be challenging when conducting research on complicated or understudied areas that do not lend themselves well to being measured with specific variables. Because it uses deductive logic and is therefore more easily viewed as "real science," the quantitative approach is often perceived as providing stronger empirical evidence than other research approaches. This method should not possess any flexibility.

6. Books and records are the primary Sources of data in:

A. Historical Research
B. Participatory Research
C. Clinical Research
D. Laboratory Research

Answer: A

Explanation: Historical research is a qualitative technique. Historical research studies the meaning of past events in an attempt to interpret the facts and explain the cause of events, and their effect in the present events. In doing so, researchers rely heavily on primary historical data (direct accounts of events, archival data - official documents, personal records, and records of eyewitnesses) and less frequently on secondary historical data (information from persons who didn't witness the event; e.g. textbooks, records, newspapers and encyclopedias etc.).

7.Which of the following statement is correct

A. Objectives should be pin-pointed
B. Objectives can be written in statement or question form
C. Another word for problem is variable
D. All the above

Answer: A

Explanation: Research objectives describe concisely what the research is trying to achieve. They summarize the accomplishments a researcher wishes to achieve through the project and provides direction to the study. A research objective must be achievable and pin-pointed, i.e., it must be framed keeping in mind the available time, infrastructure required for research, and other resources. Before forming a research objective, researcher should read about all the developments in your area of research and find gaps in knowledge that need to be addressed.

8.Which of the following options are the main tasks of research in modern society?

(I) To keep pace with the advancement in knowledge.
(II) To discover new things.
(III) To write a critique on the earlier writings.
(IV) To systematically examine and critically analyze the investigations sources with objectivity.

A. IV, II and I
B. I, II and III
C. II, III, and IV
D. All of the above

Answer: C

Explanation: The main tasks of the modern researcher to discover new ideas and theories keeping pace with the advancement of knowledge. The main aim of the research is systematically and critically analyzing the investigation sources with objectivity**.**

9. Match List-J (Interviews) with List-II (Meaning) and select the correct answer from the code given below:

List-I (Interviews)	**List -ll (Meaning)**
(a) Structured interviews	(i) greater flexibility approach
(b) Unstructured interviews	(ii) attention on the questions to be answered
(c) Focused interviews	(iii) individual life experience.
(d) Clinical interviews	(iv) Pre determined question
	(v) non-directive

Choose the correct option

	(a)	(b)	(c)	(d)
A.	(iv)	(i)	(ii)	(iii)
B.	(ii)	(iv)	(i)	(iii)
C.	(v)	(ii)	(iv)	(i)
D.	(i)	(iii)	(v)	(iv)

Answer: A

Explanation: Structured interview is always pre-determined with questionnaires but in case unstructured interview, it is not pre-determined. So, there is lots of flexibility in the unstructured interview. Clinical Interview is based on the life experience of individual. This is mostly about the real-life situation.

10. What do you consider as the main aim of interdisciplinary research?

A. To bring out holistic approach to research.
B. To reduce the emphasis of single subject in research domain.
C. To over simplify the problem of research.
D. To create a new trend in research methodology.

Answer: A

Explanation: An Interdisciplinary Research is holistic academic program or process seeking to synthesize broad perspectives, knowledge, skills, interconnections, and epistemology in an educational setting. Interdisciplinary programs may be founded in order to facilitate the study of subjects which have some coherence, but which cannot be adequately understood from a single disciplinary perspective (for example, women's studies or medieval studies). More rarely, and at a more advanced level, interdisciplinarity may itself become the focus of study, in a critique of institutionalized disciplines' ways of segmenting knowledge.

11. The depth of any research can be judged by:

A Title of the research.
B. Objectives at the research
C. Total expenditure on the research.
D. Duration of the research.

Answer: B

Explanation: Depth of Research refers to both the purpose and practice of research use—the ways in which evidence use is meaningful, systematic, and likely to generate improvements in policy and practice. The title of the research exposes what is the theme or subject matter of the research but the objective of the research clearly discloses the usefulness and depth of the research.

12. Research can be conducted by a person who:

A. Has studied research methodology
B. Holds a postgraduate degree.
C. Possesses thinking and reasoning ability
D. Is a hard worker

Answer: C

Explanation: The basic qualities of a researcher are intelligence, honesty, curiosity and initiative, enough knowledge, and good in oral and written communication. It cannot be denied that a researcher must be intelligent enough. Anyway, it is unlikely for a person who is not intelligent enough to ever think of doing a formal research and turn it to a book or a published article. Research requires critical analysis, logical reasoning, and common sense.

13. Which of the following statements is correct?

A. Objectives of research are stated in first chapter of the thesis
B. Researcher must possess analytical ability.
C. Variability in the source of problem
D. All the above

Answer: D

Explanation: All the above-mentioned statements are correct. A good research paper definitely contains its objective in the very first chapter because without proper clarification of research objective, it is not fully comprehensible. Researcher obviously must possess inquisitive bend of mind.

14. A research problem is feasible only when:

A. It has utility and relevance
B. It is researchable
C. It is new and adds something to knowledge
D. All the above

Answer: D

Explanation: For researcher, choosing a topic for their dissertation comes organically, or it may have even been part of the reason they pursued their PhD in the first place. However, for others, it can be a bit more of a struggle. This can be for a number of reasons. In order to discover a study topic that is not only feasible but also reasonable, justifiable, and necessary, a researcher must find topic according to its utility and relevance. The research must open plethora of knowledge to the world.

15. Fundamental Research reflects the ability to:

A Synthesize new ideals
B. Expound new principles
C. Evaluate the existing material concerning research
D. Study the existing Iterative regarding various topics

Answer: B

Explanation: Fundamental research, also known as **basic research** or **pure research** does not usually generate findings that have immediate applications in a practical level. Fundamental research is driven by curiosity and the desire to expand knowledge and principles in specific research area. This type of research makes a specific contribution to the academic body of knowledge in the research area. Fundamental studies tend to make generalizations about the phenomenon, and the philosophy of this type of studies can be explained as 'gathering knowledge for the sake of knowledge'. Fundamental researches mainly aim to answer the questions of why, what or how and they tend to contribute the pool of fundamental knowledge in the research area.

16. The study in which the investigators attempt to trace an effect is known as

A. Survey Research
B. 'Ex-post Facto' Research
C. Historical Research
D. Summative Research

Answer: B

Explanation: Ex post Facto Research or after-the-fact research is a category of research design in which the investigation starts after the fact has occurred without interference from the researcher. The majority of social research, in contexts in which it is not possible or acceptable to manipulate the characteristics of human participants, is based on ex post facto research designs. It is also often applied as a substitute for true experimental research to test hypotheses about cause-and-effect relationships or in situations in which it is not practical or ethically acceptable to apply the full protocol of a true experimental design.

17. The experimental study is based on:

A. The manipulation of variables
B. Conceptual parameters
C. Replication of research
D. Survey of literature

Answer: C

Explanation: Experimental study is "study in which conditions are under the direct control of the investigator". It is employed to test the efficacy of a preventive or therapeutic measure. Experimental studies can provide the strongest evidence about the existence of a cause-effect relationship. It is mainly based on the replication of research.

18. The main characteristic of scientific research is:

A. Empirical
B. Theoretical
C. Experimental
D. All of the above

Answer: C

Explanation: Scientific research mat be defined as systematic, controlled, experimental, empirical and critical investigation of hypothetical propositions about the presumed relation of observed phenomena. The basic characteristic that distinguishes scientific research from other method of research, is its dependence on experiment of pre-assumed situation and observation.

19. Research problem is selected from the stand point of:

A. Researcher's interest
B. Financial support
C. Social relevance
D. Availability of relevant literature

Answer: C

Explanation: Criteria in selecting a good research problem.

1.Topic of research selected should be within the range your resources and having social relevance.

2. Data should be accessible.

3.Selected research problem should have a solution.

4.Research methodology should be manageable and understandable.

5. The research problem should of sufficient magnitude and scope to fulfill the requirements that motivate the study.

6.The research problem should have enough variables.

20. Field-work based research is classified as:

A. Empirical
B. Historical
C. Experimental
D. Biographical

Answer: A

Explanation: Empirical research is a type of research methodology that makes use of verifiable evidence in order to arrive at research outcomes. In other words, this type of research relies solely on evidence obtained through observation or scientific data collection methods. Empirical research can be carried out using qualitative or quantitative observation methods, depending on the data sample, that is, quantifiable data or non-numerical data. So, field work is mandatory in the empirical research. Unlike theoretical research that depends on preconceived notions about the research variables, empirical research carries a scientific investigation to measure the experimental probability of the research variables.

21. The research is always-

A. Verifying the old knowledge
B. Exploring new knowledge
C. Filling the gap between knowledge
D. All of these

Answer: D

Explanation: Research is defined as the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies and understandings. This could include synthesis and analysis of previous research to the extent that it leads to new and creative outcomes.

22. The research that applies the laws at the time or field study to draw more and more clear ideas about the problem is:

A. Applied research
B. Action research
C. Experimental research
D. None of these

Answer: A

Explanation: The pursuit of information that can be directly applied to practice is aptly known as **applied research.** The goal of this research is to determine the applicability of theory and principles by testing hypotheses within specific settings. Researchers in this field try to find immediate solutions to existing problems facing a society or an industrial or business organization. The approach is much more useful as it strives to find information that will directly influence practice.

23. The process not needed in experimental research is:

A. Observation
B. Manipulation and replication
C. Controlling
D. Reference Collection

Answer: D

Explanation: Experimental research, often considered to be the "gold standard" in research designs, is one of the most rigorous of all research designs. In this design, one or more independent variables are manipulated by the researcher (as treatments), subjects are randomly assigned to different treatment levels (random assignment), and the results of the treatments on outcomes (dependent variables) are observed. The unique strength of experimental research is its internal validity (causality) due to its ability to link cause and effect through treatment manipulation, while controlling for the spurious effect of extraneous variable. As experimental research depends on experiment and observation, therefore, reference collection is not so much important.

24. A research problem is not feasible only when:

A. It is researchable.
B. It is new and adds something to knowledge
C. It consists of independent and dependent variables
D. It has utility and relevance.

Answer:-C

Explanation: Dependent Variable: The variable that depends on other factors that are measured. These variables are expected to change as a result of an experimental manipulation of the independent variable or variables. Independent Variable: It is the presumed effect. The variable that is stable and unaffected by the other variables you are trying to measure. It refers to the condition of an experiment that is systematically manipulated by the investigator. But the amalgamation of dependent and independent variable can spoil the feasibility of research problem.

25. The research which is exploring new facts through the study of the past is called

A. Philosophical research
B. Historical research
C. Mythological research
D. Content analysis

Answer: B

Explanation: Historical research is a qualitative technique. Historical research studies the meaning of past events in an attempt to interpret the facts and explain the cause of events, and their effect in the present events. In doing so, researchers rely heavily on primary historical data (direct accounts of events, archival data - official documents, personal records, and records of eyewitnesses) and less frequently on secondary historical data (information from persons who didn't witness the event; e.g. textbooks, newspapers, encyclopedias).

26. Action research is

A. An applied research
B. A research carried out to solve immediate problems
C. A longitudinal research
D. Simulative research

Answer: B

Explanation: Action research is a philosophy and methodology of research generally applied in the social sciences to resolve immediate problem. It seeks transformative change through the simultaneous process of taking action and doing research, which are linked together by critical reflection. Kurt Lewin, then a professor at MIT, first coined the term "action research" in 1944. In his 1946 paper "Action Research and Minority Problems" he described action research as "a comparative research on the conditions and effects of various forms of social action and research leading to social action" that uses "a spiral of steps, each of which is composed of a circle of planning, action and fact-finding about the result of the action".

27. The process not needed in Experimental Researches is

A. Observation
B. Manipulation.
C. Controlling
D. Content Analysis

Answer: B

Explanation: Experimental manipulation describes the process by which researchers purposefully change, alter, or influence the independent variables, which are also called treatment variables or factors, in an experimental research design. Manipulation is not the part of experimental research design.

28. Manipulation is always a part of

A. Historical research
B. Fundamental research
C. Descriptive research
D. Experimental research

Answer: C

Explanation: Descriptive research describes and interprets what is. It is concerned with conditions or relationships that exist, the practices that prevail, the beliefs or attitudes that are held, the processes that are going on; effects that are being felt or trends that are developments. The approach is directed towards identifying various characteristics of research problems and to create observations conducive to further research. Descriptive research describes characteristics of an existing phenomenon. Descriptive research provides a broad picture of a phenomenon you might be interested in exploring. Current employment rates, census of any country, number of working single parents are examples of descriptive research. In this research, the experimenter purposely changes or varies the independent variables over the course of the investigation. So, manipulation is part of descriptive research.

29. Which correlation co-efficient best explains the relationship between creativity and Intelligence?

A 1.00
B. 0.6
C. 0.5
D. 0.3

Answer: B

Explanation: The relationship between intelligence and creativity is that both of them are functions of the brain that process information to determine a solution or an answer to a problem. Intelligence and creativity are different abilities that contribute to the other. Intelligence can be measured by the intelligence quotient or IQ. Creativity, on the other hand, is not so easy to measure. The general belief is that people with high IQs are generally more creative, and people who are highly creative have high IQs. Although scientists have found a correlation between those individuals with an IQ of 120 or more having a higher level of creativity, the relationship between intelligence and creativity is more of an overlap of skills or abilities instead of a dependence on one another. The correlation co-efficient which best explains the relationship between creativity and intelligence is 1.

30. Action research means

A. A longitudinal research
B. An applied research
C. A research initiated to solve an immediate problem
D. A research with socio-economic objective

Answer: C

Explanation: Action research can be defined as “an approach in which the action researcher and a client collaborate in the diagnosis of immediate problem and in the development of a solution based on the diagnosis”. In other words, one of the main characteristic traits of action research, is to solve immediate problems.

31. Research is

A Searching again and again
B. Finding solution to any problem
C. Working in a scientific way to search for truth of any problem
D. None of the above

Answer: C

Explanation: Research is a careful and true consideration of study regarding a particular concern or problem using scientific methods. According to the American sociologist Earl Robert Babbie, "Research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon".

32. If a researcher conducts a research on finding out which administrative style contributes more too institutional effectiveness?
This will be an example of

A. Basic Research
B. Action Research
C. Applied Research
D. None of the above

Answer: C

Explanation: Applied research is a methodology used to solve a specific, practical issue affecting an individual or group. This scientific method of study and research is used in business, medicine, and education in order to find solutions that may improve health, solve scientific problems or develop new technology. If a researcher conducts research on finding out which administrative style contributes more effectiveness, that implies that the researcher trying to find he solution of the immediate problem. Examples of applied research topics will show, how this method can be used to address everyday problems.

33. Which of the following variables cannot be expressed its quantitative terms?

A. Socio-economic Status
B. Marital Status
C. Numerical Aptitude
D. Professional Attitude

Answer: D

Explanation: Variables can be classified as qualitative (categorical) or quantitative (numeric). Qualitative variables take on values that are names or labels. The color of a ball (e.g., red, green, blue) or the breed of a dog (e.g. collie, shepherd, terrier) would be examples of qualitative or categorical variables. Quantitative variables are numeric. They represent a measurable quantity. For example, when we speak of the population of a city, we are talking about the number of people in the city - a measurable attribute of the city. Therefore, population would be a quantitative variable. Except professional attitude, all other variables can be counted.

34. A doctor studies the relative effectiveness of two drugs of dengue fever. His research would be classified as

A. Descriptive Survey
B. Experimental Research
C. Case Study
D. Ethnography

Answer: B

Explanation: Experimental research is a scientific approach to research, where one or more independent variables are manipulated and applied to one or more dependent variables to measure their effect on the latter. The experimental research method is widely used in physical and social sciences, psychology, and education. Mostly related to a laboratory test procedure, experimental research designs involve collecting quantitative data and performing statistical analysis on them during research.

35. The term 'phenomenology` is associated with the process of

A Qualitative Research
B. Analysis of Variance
C. Correlational Study
D. Probability Sampling

Answer: A

Explanation: Qualitative research is informed by several philosophical assumptions and examines aspects of human life such as culture, expression, beliefs, morality and imagination. There are several different research approaches, or research designs, that qualitative researchers use. Phenomenology is one of them. Phenomenology describes the "subjective reality" of an event, as perceived by the study population; it is the study of a phenomenon.

36. Which of the following phrases is not relevant to describe the meaning of research as a process?

A. Systematic Activity
B. Objective Observation
C. Trial and Error
D. Problem Solving

Answer: C

Explanation: Trial and error is not important is research. It is not a method of finding the best solution, nor a method of finding all solutions. It is a problem-solving technique that is used simply to find a solution. It is not the method to get satisfactory result until error is reduced or eliminated.

37. Which of the following is not an example of a continuous variable?

A. Family size
B. Intelligence
C. Height
D. Attitude

Answer: D

Explanation: Continuous variables can take on almost any numeric value and can be meaningfully divided into smaller increments, including fractional and decimal values. You often measure a continuous variable on a scale. For example, when we measure height, weight, and temperature, you we continuous data. But attitude cannot be measured. With continuous variables, you can calculate and assess the mean, median, standard deviation, or variance.

38. The Sociogram' technique is used to study

A Vocational Interest
B. Professional Competence
C. Human Relations
D. Achievement Motivation

Answer: C

Explanation: A sociogram is a visual depiction of the relationships among a specific group. The purpose of a sociogram is to uncover the underlying relationships between people. A sociogram can be used to increase your understanding of group behaviors.

39. Newton gave three basic laws of motion. This research is categorized as

A. Descriptive Research
B. Sample Survey
C. Fundamental Research
D. Applied Research

Answer: C

Explanation: **Fundamental research,** also known as **basic research** or **pure research,** does not usually generate findings that have immediate applications in a practical level. Fundamental research is driven by curiosity and the desire to expand knowledge in specific research area. This type of research makes a specific contribution to the academic body of knowledge in the research area. Fundamental studies tend to make generalizations about the phenomenon, and the philosophy of this type of studies can be explained as 'gathering knowledge for the sake of knowledge'. Fundamental researches mainly aim to answer the questions of why, what or how and they tend to contribute the pool of fundamental knowledge in the research area. Newton's invention of three basic law of motion is also the result of his intention to expand the knowledge in scientific area.

40. Research is conducted to

I. Generate new knowledge
II. Not to develop a theory
III. Obtain research degree
IV. Re-interpret existing knowledge

A. I, III & II
B. III,II, & IV
C. II, I& III
D. I,III, & IV

Answer: D

Explanation: The major aims of the research is to innovate and contribute new theorem to the society for the betterment of human being. It is through the research; many new theorems have been propounded and these extremely beneficial for scientific and socio-cultural development. So, developing new ideas and principles is the basic objective of research.

41. Controlled group condition, is applied in

A. Survey Research
B. Historical Research
C. Experimental Research
D. Descriptive Research

Answer: C

Explanation: The control group is composed of participants who do not receive the experimental treatment. When conducting an experiment, these people are randomly assigned to be in this group. They also closely resemble the participants who are in the experimental group or the individuals who receive the treatment. So, controlled group is an integral part of experimental research.

42. The research that aims at immediate application is:

A. Action Research
B. Empirical Research
C. Conceptual Research
D. Fundamental Research

Answer: A

Explanation: Action research can be defined as "an approach in which the action researcher and a client collaborate in the diagnosis of immediate problem and in the development of a solution based on the diagnosis". In other words, one of the main characteristic traits of action research, is to solve immediate problems.

43. Ex Post Facto research means:

A. The research is carried out after the incident
B. The research is carried out prior to the incident
C. The research is carried out along with the happening of an incident.
D. The research is carried out keeping in mind the possibilities of an incident.

Answer: A

Explanation: An ex post facto research design is a method in which groups with qualities that already exist are compared on some dependent variable. Also known as "after the fact" research, an ex post facto design is considered quasi-experimental because the subjects are not randomly assigned - they are grouped based on a particular characteristic or trait.

44. Which one of the following is an indication of the quality of a research Journal?

A. Impact factor
B. h-index
C. g-index
D. iolo-index

Answer: A

Explanation: The impact factor (IF) is a measure of the frequency with which the average article in a journal has been cited in a particular year. It is used to measure the importance or rank of a journal by calculating the times its articles are cited.

45. In doing action research what is the usual sequence of steps?

A. Reflect, observe, plan, act
B. Plan, act, observe, reflect
C. Plan, reflect, observe, act
D. Act, observe, plan, reflect

Answer: B

Explanation: In a good research design, first planning is necessary. Without proper planning, the research goal cannot be fulfilled. After the planning, we need to collect data and analyze it. Then observation of the data is also necessary for reflection of result.

46. Which is the main objective of research?

A. To review the literature
B. To summarize what is already known
C. To get an academic degree
D. To discover new facts or to make fresh interpretation of known facts

Answer: D

Explanation: The objective of research project summarizes what is to be achieved by the study. The research objectives are the specific accomplishments the researcher hopes to achieve by the study. Following are the objectives of research:

(i) To systematically examine and critically analyze the investigations sources with objectivity.
(ii) To discover new things.
(iii)To keep pace with the advancement in knowledge.
(iv)To find out the depth of research.

47. The principles of fundamental research are used in

A. Action research
B. Applied research
C. Philosophical research
D. Historical research

Answer: B

Explanation: Fundamental studies tend to make generalizations about the phenomenon, and the philosophy of this type of studies can be explained as ‘gathering knowledge for the sake of knowledge’. Fundamental researches mainly aim to answer the questions of why, what or how and they tend to contribute the pool of fundamental knowledge in the research area. Differences between applied and fundamental research have been specified in a way that fundamental research studies individual cases without generalizing, and recognizes that other variables are in constant change. Applied research, on the contrary, seeks generalizations and assumes that other variables do not change. But the theories of fundamental research are also applied in the applied research.

48. The research approach of Max Weber to understand how people create meanings in natural `settings is identified as

A. Positive paradigm
B. Critical paradigm
C. Natural paradigm
D. Interpretative paradigm

Answer: A

Explanation: The interpretive paradigm is concerned with understanding the world as it is from subjective experiences of individuals. They use meaning (versus measurement) oriented methodologies, such as interviewing or participant observation, that rely on a subjective relationship between the researcher and subjects.

49. The research stream of immediate application is

A Conceptual research
B. Action research
C. Fundamental research
D. Empirical research

Answer: B

Explanation: Action research can be defined as "an approach in which the action researcher and a client collaborate in the diagnosis of immediate problem and in the development of a solution based on the diagnosis". In other words, one of the main characteristic traits of action research, is to solve immediate problems.

50. "Sampling Cases' means

A. Sampling using a sampling frame
B. Identifying people who are suitable for research
C. Literally the researcher's brief case
D. Sampling of people, newspapers, television programmes etc.

Answer: D

Explanation: Sampling is a technique of selecting individual members or a subset of the population to make statistical inferences from them and estimate characteristics of the whole population. Different sampling methods are widely used by researchers in market research so that they do not need to research the entire population to collect actionable insights. It is also a time-convenient and a cost-effective method and hence forms the basis of any research design.

51. The frequency distribution of a research data which is symmetrical in shape similar to a normal distribution but center peek is much higher, is

A. Skewed
B. Mesokurtic
C. Leptokurtic
D. Platykurtic

Answer: B

Explanation: Mesokurtic is a statistical term used to describe the outlier characteristic of a probability distribution in which extreme events (or data that are rare) is close to zero. A mesokurtic distribution has a similar extreme value character as a normal distribution.

52. Which of the following statements regarding the meaning of research are correct?
(a) Research refers to a series of systematic activity or activities undertaken to find out the solution of a problem.
(b) It is a systematic, logical and an unbiased process wherein verification of hypothesis, data analysis, interpretation and formation of principles can be done.
(c) It is an intellectual enquiry or quest towards truth.
(d) It leads to entrancement of knowledge.
Select the correct answer from the codes given below:

A. (a), (b) and (c)
B. (b), (c) and (d)
C. (a), (c) and (d)
D. (a), (b), (c) and (d)

Answer: D

Explanation: Research is simply a systematic and refined technique of thinking employing specialized tools, instruments and procedures in order to obtain a more adequate solution of a problem, collect data or facts, analyze these critically and reach at decisions based on the actual evidence. It involves original work instead of mere exercise of personal experiences. It evolves from a genuine desire to know rather than a desire to prove something, it is quantitative, seeking to know not only what but how much, and measurement is therefore, a central feature of it.

53. Jean Piaget gave a theory of cognitive development of humans on the basis of his:

A. Fundamental Research
B. Applied Research
C. Action Research
D. Evaluation Research

Answer: A

Explanation: Fundamental research, also known as basic research or pure research does not usually generate findings that have immediate applications in a practical level. Fundamental research is driven by curiosity and the desire to expand knowledge in specific research area. This type of research makes a specific contribution to the academic body of knowledge in the research area. Fundamental studies tend to make generalizations about the phenomenon, and the philosophy of this type of studies can be explained as 'gathering knowledge for the sake of knowledge'. Fundamental researches mainly aim to answer the questions of why, what or how and they tend to contribute the pool of fundamental knowledge in the research area. Jean Piaget's invention of cognitive development theory is a fundamental research as it trends to generalize the phenomena.

54. The conclusions/findings of which type of research cannot be generalized to other situations?

A. Historical Research
B. Descriptive Research
C. Experimental Research
D. Causal Comparative Research

Answer: A

Explanation: Historical research studies the meaning of past events in an attempt to interpret the facts and explain the cause of events, and their effect in the present events. In doing so, researchers rely heavily on primary historical data (direct accounts of events, archival data - official documents, personal records, and records of eyewitnesses) and less frequently on secondary historical data (information from persons who didn't witness the event; e.g. textbooks, newspapers, encyclopedias). The conclusion of the historic research cannot be generalized with other situation because historical research is fact oriented.

55. Which of the following statements is not true in the context of participatory research?

A. It recognizes knowledge as power.
B. It emphasizes on people as experts.
C. It is a collective process of enquiry.
D. Its sole purpose is production of knowledge.

Answer: D

Explanation: Participatory research comprises a range of methodological approaches and techniques, all with the objective of handing power from the researcher to research participants, who are often community members or community-based organizations. In participatory research, participants have control over the research agenda, the process and actions. Most importantly, people themselves are the ones who analyses and reflect on the information generated, in order to obtain the findings and conclusions of the research process.

56. A researcher intends to explore the effect of possible factors for the organization of effective mid-day meal interventions.
Which research method will be most appropriate for this study?

A. Historical method
B. Descriptive survey method
C. Experimental method
D. Ex-post-facto method

Answer: D

Explanation: An ex post facto research design is a method in which groups with qualities that already exist are compared on some dependent variable. Also known as "after the fact" research, an ex post facto design is considered quasi-experimental because the subjects are not randomly assigned - they are grouped based on a particular characteristic or trait. In the above-mentioned situation, the researcher intended to explore the effect of possible factor an existing paradigm.

57. In qualitative research paradigm, which of the following features may be considered critical?

A. Data collection with standardized research tools.
B. Sampling design with probability sample techniques.
C. Data collection with bottom-up empirical evidences.
D. Data gathering to take place with top- down systematic evidences.

Answer: C

Answer: A bottom-up approach is the piecing together of systems to give rise to more complex systems, thus making the original systems sub-systems of the emergent system. Bottom-up processing is a type of information processing based on incoming data from the environment to form a perception. In qualitative research, it is very difficult to collect date with bottom up empirical evidences.

58. The principal of a school conducts an overview session of teachers and students with a view to explore the possibility of their enhanced participation in school programmes. This endeavor may be related to which type of research.

A. Evaluation Research
B. Fundamental Research
C. Action Research
D. Applied Research

Answer: C

Explanation: In schools, **action research** refers to a wide variety of evaluative, investigative, and analytical research methods designed to diagnose problems or weaknesses—whether organizational, academic, or instructional—and help educators develop practical solutions to address them quickly and efficiently. Action research may also be applied to programs or educational techniques that are not necessarily experiencing any problems, but that educators simply want to learn more about and improve. The general goal is to create a simple, practical, repeatable process of iterative learning, evaluation, and improvement that leads to increasingly better results for schools, teachers, or programs.

59. In doing action research what is the usual sequence of steps?

A. Reflect, observe, plan, act
B. Plan, act, observe, reflect
C. Plan, reflect, observe, act
D. Act, observe, plan, reflect

Answer: B

Explanation: In a good research design, first planning is necessary. Without proper planning, the research goal cannot be fulfilled. After the planning, we need to collect data and analyze it. Then observation of the data is also necessary for reflection of result.

60. Below are given two sets-research methods (Set-1) and data collection tools (Set-11). Match the two sets and indicate your answer by Selecting the correct code:

Set-1	Set-II
(a) Experimental method	(i) Using primary and Secondary Sources
(b) Ex post-facto method	(ii) Questionnaire
(c) Descriptive survey method	(iii) Standardized tests
(d) Historical method	(iv) Typical characteristic tests

Codes:

	(a)	(b)	(c)	(d)
A	(ii)	(i)	(iii)	(iv)
B.	(iii)	(iv)	(ii)	(i)
C.	(ii)	(iii)	(i)	(iv)
D.	(ii)	(iv)	(iii)	(i)

Answer: B

Explanation: Experimental method comprises of standardize test while in ex post-facto research typical characteristic test is used for data collection. Similarly, survey method comprises some previously set questions.

61. Which of the following research types focuses on ameliorating the prevailing situations?

A. Fundamental Research
B. Applied Research
C. Action Research
D. Experimental Research

Answer: C

Explanation: Action research can be defined as "an approach in which the action researcher and a client collaborate in the diagnosis of immediate problem and in the development of a solution based on the diagnosis". In other words, one of the main characteristic traits of action research, is to solve immediate problems.

62. A researcher attempts to evaluate the effect of method of feeding on anxiety-proneness of children.

Which method of research would be appropriate for this?

A. Case study method
B. Experimental method
C. Ex-post-facto method
D. Survey method

Answer: C

Explanation: Ex post-facto method will be appropriate to find the solution to the problem because the researcher is aware of the research problem. The researcher is going to find out the possible solution of an event which is already happened. So, Ex post-facto is suitable research design in this situation.

63. There are two sets given below.
Set- I specifies the types of research, While Set – II indicates their characteristics.
Match the two and give your answer by selecting the appropriate code.

Set - I (Research types)	Set –II (Characteristics)
(a) Fundamental research	(i) Finding out the extent of perceived impact of an intervention
(b) Applied research	(ii) Developing an effective explanation through theory building
(c) Focused interviews	(iii) individual life experience.
(d) Clinical interviews	(iv) Pre determined question
	(v) non-directive

Code:	(a)	(b)	(c)	(d)
A.	(iv)	(i)	(ii)	(iii)
B.	(ii)	(iv)	(i)	(iii)
C.	(v)	(ii)	(iv)	(i)
D.	(i)	(iii)	(v)	(iv)

Answer: A

Explanation: Structured interview is always pre-determined with questionnaires but in case unstructured interview, it is not pre-determined. So, there is lots of flexibility in the unstructured interview. Clinical Interview is based on the life experience of individual. This is mostly about the real-life situation.

Sub Unit – 2

64. One of the aims of the scientific method-in research is to:

A. Improve data interpretation
B. Eliminate spurious relations
C. Confirm triangulation
D. Introduce new variables

Answer: B

Explanation: Spurious is a term used to describe a statistical relationship between two variables that would, at first glance, appear to be causally related, but upon closer examination, only appear so by coincidence or due to the role of a third, intermediary variable. The best tool for spotting a spurious relationship in research findings is common sense. The best way to eliminate spuriousness in a research study is to control for it, in a statistical sense, from the start. This involves carefully accounting for all variables that might impact the findings and including them in your statistical model to control their impact on the dependent variable.

65. Match List A with List B and choose the correct answer from the code given below

List A	List B
a) Historical Method	i) Past event
b) Survey Method	ii) Vision
c)Philosophical Method	iii) Present event
d)Experimental Method	iv) Exceptional Cases
	v) Future action

Code:

	(a)	(b)	(c)	(d)
A.	(i)	(iii)	(ii)	(v)
B.	(i)	(ii)	(iv)	(v)
C.	(i)	(iv)	(ii)	(v)
D.	(i)	(ii)	(iii)	(iv)

Answer: A

Explanation: Historical research studies the meaning of past events in an attempt to interpret the facts and explain the cause of events, and their effect in the present events. Survey method used to collect data from the present situation. Philosophical method explains the vision and introspection.

66. Which of the following is not the Method of Research?

A. Observation
B. Historical
C. Survey
D. Philosophical

Answer: B

Explanation: 'Historical' is not a method of research. This is a type of research. Historical research is a qualitative technique. Historical research studies the meaning of past events in an attempt to interpret the facts and explain the cause of events, and their effect in the present events. In doing so, researchers rely heavily on primary historical data (direct accounts of events, archival data - official documents, personal records, and records of eyewitnesses) and less frequently on secondary historical data (information from persons who didn't witness the event; e.g. textbooks, newspapers, encyclopedias).

67. Research can be classified as:

A. Basic, applied and action research
B. Quantitative and qualitative research
C. Philosophical, historical, survey and experimental research
D. All the above

Answer: D

Explanation: Types of research can be classified into several categories according to the nature and purpose of the study and other attributes.

7. **On the basis of Objectives:** Descriptive Research, Correlational Research, Explanatory Research, Exploratory Research, Experimental Research
8. **On the basis of Outcomes:** Fundamental Research, Applied Research
9. **On the basis of Logic:** Deductive Research, Inductive Research
10. **On the basis of Process:** Quantitative Research, Qualitative Research
11. **On the basis of Inquiry mode:** Structured Research Unstructured Research
12. **On the basis of Idea or Concept:** Conceptual Research, Empirical Research

68. One of the aims of the scientific method-in research is to:

A. Improve data interpretation
B. Eliminate spurious relations
C. Confirm triangulation
D. Introduce new variables

Answer: B

Explanation: Spurious is a term used to describe a statistical relationship between two variables that would, at first glance, appear to be causally related, but upon closer examination, only appear so by coincidence or due to the role of a third, intermediary variable. The best tool for spotting a spurious relationship in research findings is common sense. The best way to eliminate spuriousness in a research study is to control for it, in a statistical sense, from the start. This involves carefully accounting for all variables that might impact the findings and including them in your statistical model to control their impact on the dependent variable.

69. Which one is categorized as non-probability sampling?

A. Cluster sampling
B. Quota sampling
C. Systematic sampling
D. Stratified random sampling

Answer: D

Explanation: Non-probability sampling is defined as a sampling technique in which the researcher selects samples based on the subjective judgment of the researcher rather than random selection. Stratified random sampling is a method of sampling that involves the division of a population into smaller sub-groups known as strata.

70. The sequential operations in scientific research are

A. Co-variation, Elimination of Spurious Relations, Generalization, Theorization
B. Generalization, Co-variation, Theorization, Elimination of Spurious Relations
C. Theorization, Generalization, Elimination of Spurious Relations, Co-variation
D. Elimination of Spurious Relations, Theorization, Generalization, Co-variation.

Answer: A

Explanation: The sequential operation followed in the scientific research is Co-variation reflects whether deviations of elemental variables from their average across trial values covary in a way that reduces the effect of noise in individual elemental variables on performance. Then elimination of spurious element is also important.

71. Which of the following sequence of research steps is nearer to scientific method?

A. Suggested solution of the problem, deducting the consequences of the solution, Perceiving the problem situation, Location of the difficulty and testing the solutions.
B. Perceiving the problem situation, locating the actual problem and its definition, Hypothesizing, Deducting the consequences of the suggested solution and testing the hypothesis in action.
C. Defining a problem, identifying the cause of the problem, defining a population, drawing a sample, collecting data and analyzing result.
D. Identifying the casual factors, Defining the problem, developing a hypothesis, selecting a sample, collecting data and arriving at generalization and conclusions.

Answer: B

Explanation: The steps of a scientific research are as follows: (1) Identification of the research problem

(2) Formulation of the objectives (3) Formulation of the questionnaire (4) Extensive Review of the literature

(5) Formulation of the hypothesis (6) Design research (including sample design) (7) Collection of the Data

(8) Analysis of the Data (Test hypothesis if any) (9) Interpretation and report writing (10) Bibliographical Information

72. The important pre-requisites of a researcher in sciences, Social sciences and humanities are

A. laboratory skills, records, supervisor, topic
B. Supervisor, topic, critical analysis, patience
C. archives, supervisor, topic, flexibility in thinking
D. topic, supervisor. good temperament, precondoed notions

Answer: B

Explanation: Researcher in sciences, social sciences and humanities needs some important pre-requisites like supervisor, topic, critical analysis and patience.

73. One of the aims of the scientific method-in research is to:

A. Improve data interpretation
B. Eliminate spurious relations
C. Confirm triangulation
D. Introduce new variables

Answer: B

Explanation: Spurious is a term used to describe a statistical relationship between two variables that would, at first glance, appear to be causally related, but upon closer examination, only appear so by coincidence or due to the role of a third, intermediary variable. The best tool for spotting a spurious relationship in research findings is common sense. The best way to eliminate spuriousness in a research study is to control for it, in a statistical sense, from the start. This involves carefully accounting for all variables that might impact the findings and including them in your statistical model to control their impact on the dependent variable.

Abbreviation:

1. **Text: Unit wise separate pdf**
2. **PYQs: Previous Years Questions**
3. **MQs: Model Questions**
4. **LMS: Last Minute Suggestion**
5. **OMT: Online MOCK Test**
6. **DU: Daily Updates**