UNIT

2

Research Aptitude

MEANING OF RESEARCH

The word *research* is derived from the Middle French "*recherche*", which means "to go about seeking", the term itself being derived from the Old French term "*recerchier*" a compound word from "re-" + "cerchier", or "sercher", meaning 'search'. The earliest recorded use of the term was in 1577.

Thus we can say that the word research is composed of two words 'Re' and 'search.' The dictionary defines the word 're' as a prefix, meaning 'again', a 'new or over again' and the word 'search' as a verb, meaning 'to examine closely and carefully, 'to test and try' or 'to probe'. So it can be said in the words of Grinnell, "Research is a known describing a careful, systematic patient study and investigation in some field of knowledge, undertaken to establish facts or principles."

Research has been defined in a number of different ways.

- A broad definition of research is given by Martyn Shuttleworth - "In the broadest sense of the word, the definition of research includes any gathering of data, information and facts for the advancement of knowledge."
- Another definition of research is given by Creswell who states - "Research is a process of steps used to collect and analyze information to increase our understanding of a topic or issue." It consists of three steps: Pose a question, collect data to answer the question, and present an answer to the question.
- The Merriam-Webster Online Dictionary defines research in more detail as "a studious inquiry or examination; especially: investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws."
- Theodorson and Theodorson – Research "is a systematic and objective attempt to study a problem of deriving principles."
- D. Slesinger and M. Stephenson – Research is "the manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art."
- The Advanced Learner's Dictionary – Research as "a careful investigation or inquiry especially through search for new facts in any branch of knowledge."
- Redman and Mory – Research is "a systematized effort to gain new knowledge."

CHARACTERISTICS OF RESEARCH

B W Tukmann (1978) has listed the following characteristics of research

1. **Systematic:** A good research study must have various well planned steps and one step should lead to another step.
2. **Empirical:** Research is based on direct experience or observation by the researcher.
3. **Logical:** Research is based on valid procedures and principles.
4. **Replicable and transmittable:** The research design and procedures are replicated or repeated to enable the researcher to arrive at valid and conclusive results.
5. **Reductive:** Tending to present a subject or problem in a simplified form, esp. one viewed as crude.

AIMS AND OBJECTIVES OF RESEARCH:

Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings.

1) To gain familiarity with a phenomenon or to achieve new insights into it. (Exploratory or Formulative research studies.)
2) To portray accurately the characteristics of a particular individual, situation or a group. (Descriptive Research Studies).
3) To determine the frequency with which something occurs or with which it is associated with something else (Diagnostic).
4) To test a hypothesis of a casual relationship between variables (Hypothesis-Testing Research Studies.)

TYPES OF RESEARCH:

1. Fundamental/Applied/Action:

A comparative classification differentiates research in various pairs according to the form and objectives of research.

- **Fundamental Research:** This research helps in **developing theories by discovery, broad generalization and principles**. In larger perspective, discovery and the development of an organized body of scientific knowledge is fundamental research.
- **Applied Research:** Fundamental research sets principles and applied research utitlizes those principles to know the problems with best possible manner. Practically the researcher **applies the laws at the time of his / her field study** to draw more and more clear ideas about the problems.
- **Action Research:** Its aim is **immediate application but not any development of theory**. If the researcher finds any problem at time of his/ her field investigation and observation s/he applies it.

2. Descriptive vs. Analytical:

The **fact finding inquiries** and the **field surveys** are main contents of descriptive research. The major purpose of descriptive research is description of the state of affairs as it exists at present. In social science and business research we quite often use the term Ex post facto research for descriptive research studies. The main characteristic of descriptive research is that the researcher has no control over the variables; he can only report what has happened or what is happening. Most ex post facto research projects are used for descriptive studies in which the researcher seeks to measure such items as, for example, frequency of shopping, preferences of people, or similar data. Ex post facto studies also include attempts by researcher to discover cause even when they cannot control the variables. The methods of research utilised in descriptive research are survey methods of all kinds, including comparative and correlational methods. In analytical research, on the other hand, the researcher has to use facts or information already available, and analyse these to make a critical evaluation of the material. While doing analysis, the researcher may employ a host of methods of analysis depending upon the subject with which the researcher is dealing.

3. Quantitative vs. Qualitative:

Measurement of quantity is followed by quantitative research. It is applicable to phenomena that can be expressed in terms of quantity. Qualitative research, on the other hand, is concerned with qualitative phenomenon, i.e., phenomena relating to or involving quality or kind. Some techniques of such research are word association tests, sentence completion tests, story completion tests and similar other projective techniques. Attitude or opinion research i.e., research designed to find out how people feel or what they think about a particular subject or institution is also qualitative research. Qualitative research is especially important in the behavioural sciences where the aim is to discover the underlying motives of human behaviour.

4. Conceptual vs. Empirical:

The research, which is based on abstract ideas or theory, is known as conceptual research. It is generally used by philosophers and thinkers to develop new concepts or to reinterpret existing ones. On the other hand, empirical research relies on experience or observation alone, often without due regard for system and theory. It is data-based research, coming up with conclusions which are capable of being verified by observations or experiment.

Some Other Types of Research:

- **Formulative and Exploratory Research:**
  When the purpose of research is to gain familiarity with a phenomenon or acquire new insight into it in order to formulate a more precise problem or develop hypothesis, the exploratory studies (also known as formulative research) come in handy. If the theory happens to be too general or too specific, a hypothesis cannot to be formulated. Therefore a need for an exploratory research is felt to gain experience that will be helpful in formulative relevant hypothesis for more definite investigation.

- **Historical Research:**
  Historical research is a type of secondary data analysis to determine past social attitudes and community structure and how these have changed over time.

- **Experimental Research:**
  Experimental research is a systematic and scientific approach to the scientific method where the scientist manipulates variables.

- **Case study:**
  Thomas offers the following definition of case study: "Case studies are analyses of persons, events, decisions, periods, projects, policies, institutions, or other systems that are studied holistically by one or more methods. The case that is the *subject* of the inquiry will be an instance of a class of phenomena that provides an analytical frame — an *object* — within which the study is conducted and which the case illuminates and explicates."

STEPS OF RESEARCH:

The following order concerning various steps provides a useful procedural guideline regarding the Research Process:

(1) Formulating the research problem
(2) Extensive literature survey
(3) Developing the hypothesis
(4) Preparing the research design
(5) Determining sample design

(6) Collecting the data
(7) Execution of the project
(8) Analysis of data
(9) Hypothesis testing
(10) Generalizations and interpretation
(11) Preparation of the report i.e. formal write-up of conclusions reached.

1. Formulating the Research Problem:

There may be two basic natures of research problems, i.e., it may be related either to states of nature or to the relationships between variables.

At the very outset the researcher must single out the problem s/he wants to study, i.e., s/he must decide the general area of interest or aspect of a subject-matter that s/he would like to inquire into. The formulation of a general topic into a specific research problem, thus, constitutes the first step in a scientific enquiry. Task of formulating, or defining, a research problem is a step of greatest importance in the entire research process. The problem to be investigated must be defined unambiguously for that will help discriminating relevant data from irrelevant ones. Care must however be taken to verify the objectivity and validity of the background facts concerning the problem as upon it depends the success of the whole of the research.

2. Extensive Literature Survey:

The researcher must examine available literature on the problem to get more and more information regarding the problem. He/she may refer to both type of literature i.e. conceptual (related to concepts/theory) and empirical (related to data/statistics) which will enable the researcher to specify his/her own research problem in a specific way. Whenever one starts thinking of a research problem, it is important to find out all the available literature on the topic of interest and go through them as it helps in figuring out what not only the viability of the research (in the sense, if the research problem can be carried out or not, whether the research is already been done in some part of the world or not, etc.), but also to point out how within the existing body of knowledge there is some area which needs further studies / research.

One must remember here that a research problem should be one which no one has worked till now, therefore after figuring out the literatures available on the topic, the researcher must ascertain –

- how his or her research problem is unique
- how it is a problem on which people have not pondered over yet
- how it is an important addition to the pool of knowledge
- how it is going to help the world / humankind in their existence, etc.

3. Development of Working Hypothesis:

Working hypothesis is tentative assumption made in order to draw out and test its logical or empirical consequences. After extensive literature survey, researcher should state in clear terms the working hypothesis or hypothesis. It may be based on all or any of the following.

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

4. Preparing the Research Design:

The preparation of the research design, appropriate for a particular research problem, involves usually the consideration of the following:

(a) The means of obtaining the information.

(b) The availability and skills of the researcher and his staff (if any)
(c) Explanation of the way in which selected means of obtaining information will be organised and the reasoning leading to the selection.
(d) The infrastructure needed for the research, such as laboratory, etc.
(e) The time available for research
(f) The cost factor relating to research, i.e., the finance / budget available for the purpose.

5. Determining Sample Design:

The items selected for research constitute what is technically called a sample. The researcher must decide the way of selecting a sample or what is popularly known as the sample design. In other words, a sample design is a definite plan determined before any data are actually collected. Samples can be either probability samples or non-probability samples. With probability samples each element has an equal probability of being included in the sample but the non-probability samples do not allow the researcher to determine this probability. Probability samples are those based on simple random sampling, systematic sampling, stratified sampling, cluster/area sampling whereas non-probability samples are those based on convenience sampling, judgement sampling and quota sampling techniques. Some important sample designs are described below.

(i) Deliberate Sampling:

This sampling method involves purposive or deliberate selection of particular units of the universe for constituting a sample which represents the universe. Therefore this is also knows as purposive or non probability sampling. When population elements are selected for inclusion in the sample based on the case of access, it can be called convenience sampling. If a researcher wishes to secure data from, say, petrol buyers, he may select a fixed number of petrol stations and may conduct interviews at these stations. This would be an example of convenience sample of petrol buyers. At times such a procedure may give very biased results particularly when the population is not homogeneous. On the other hand, in judgement sampling the researcher's judgement is used for selecting items which he considered as representative of the population. For example, a judgement sample of college students might be taken to secure reactions to a new method of teaching. Judgement sampling is used quite frequently in qualitative research where the desire happens to be development of hypothesis rather than to generalise it.

(ii) Simple Random Sampling:

In this sampling each and every item in the population has an equal chance of inclusion in the sample and each one of the possible samples, in case of finite universe, has the same probability of being selected. Lottery method is best example of simple random sampling. This is useful in case of small homogeneous population.

(iii) Systematic Sampling:

In some instances the most practical way of sampling is to select every 15th name on list, every 10th house on one side of a street and so on. Sampling of this type is known as systematic sampling. An element of randomness is usually introduced into this kind of sampling by using random numbers to pick up the unit with which to start. This procedure is useful when sampling frame is available in the form of a list. In such a design the selection process starts by picking some random point in the list and then every n^{th} element is selected until the desired number is secured.

(iv) Stratified Sampling:

If the population from which a sample is to be drawn does not constitute a homogeneous group, then stratified sampling technique is applied so as to obtain a representative sample. In this technique, the population is stratified into a number of non-overlapping subpopulations or strata and sample items are selected from each stratum.

(v) Quota Sampling:

In stratified sampling the cost of taking random samples from individual strata is often so expensive that interviewers are simply given quota to be filled from different strata, the actual selection of items of sample being left to the interviewer's judgement. The size of the quota for each stratum is generally proportionate to the size of that stratum in the population. Quota sampling is thus an important form of non-probability sampling. Quota samples generally happen to be judgement samples rather than random samples.

(vi) Cluster Sampling and Area Sampling:

Cluster sampling involves grouping the population and then selecting the groups or the clusters rather than individual elements for inclusion in the sample. Suppose some grocery store wishes to sample its membership card holders. It has issued its cards to 15,000 customers. The sample size is to be kept say 450. For cluster sampling this list of 15,000 card holders could be formed into 100 clusters of 150 card holders each. Three clusters might then be selected for the sample randomly. The sample size must often be larger than the simple random sample to ensure the same level of accuracy because in cluster sampling procedural potential for order bias and other sources of error is usually accentuated. The clustering approach can, however, make the sampling procedure relatively easier and increase the efficiency of field work, especially in the case of personal interviews. Area sampling is quite close to cluster sampling and is often talked about when the total geographical area of interest happens to be big one. Under area sampling we first divide the total area into a number of smaller areas and randomly selected, small areas are included in the sample. Area sampling is especially helpful where we do not have the list of the population concerned. It also makes the field interviewing more efficient since interviewer can do many interviewers at each location.

(vii) Multi-Stage Sampling:

This is a further development of the idea of area sampling. This technique is meant for big inquiries extending to a considerably large geographical area like an entire country. Under multi-stage sampling the first stage may be to select large primary sampling units such as states, then districts, then towns and finally certain families within towns. If the technique of random sampling is applied at all stages, the sampling procedure as multi-stage random sampling.

(viii) Sequential Sampling:

This is somewhat a complex sample design where the ultimate size of the sample is not fixed in advance but is determined according to mathematical decisions on the basis of information yielded as survey progresses. This design is usually adopted under acceptance sampling plan in the context of statistical quality control.

6. Deciding the method for collecting the Data.

There are several ways of collecting the appropriate data which differ considerably in context of money, costs, time and other resources at the disposal of the researcher.

Primary data can be collected either through experiment or though survey. If the researcher conducts an experiment, s/he observes some quantitative measurements, or the data, with the help of which s/he examines the truth contained in hypothesis. But in the case of survey, data can be collected by any one or more of the following ways:

(i) By Observation: This method implies the collection of information by way of investigator's own observation, without interviewing the respondents. The information obtained relates to what is currently happening and is not complicated by either the past behaviour or future intensions or attitudes of respondents. This method is no doubt an expensive method and the information provided by this method is also very limited. As such this method is not suitable in inquiries where large samples are concerned.

(ii) Through Personal Interviews: The investigator follows a rigid procedure and seeks answers to a set of preconceived questions through personal interviews. This method of collecting data is usually carried out in a structured way where output depends upon the ability of the interviewer to a large extent.

(iii) Through Telephone interviews: This method of collecting information involves contacting the respondents on telephone itself. This is not a very widely used method but it plays an important role in industrial surveys in developed regions, particularly, when the survey has to be accomplished in a very limited time.

(iv) By mailing of questionnaires: The researcher and the respondents do not come in contact with each other if this method of survey is adopted. Questionnaires are mailed to the respondents with a request to return after completing the same. It is the most extensively used method in various economic and business surveys. Before applying this method, usually a Pilot Study for testing the questionnaire is conducted which reveals the weaknesses, if any, of the questionnaire? Questionnaire to be used must be prepared very carefully so that it may prove to be effective in collecting, the relevant information.

(v) Through Schedules: Under this method the enumerators are appointed and given training. They are provided with schedules containing relevant questions. These enumerators go to responders with these schedules. Data are collected by filing up the schedules by enumerators on the basis of replies given by respondents. Much depends upon the capability of enumerators so far as this method is concerned. Some occasional field checks on the enumerators may ensure sincere work.

The researcher should select one of these methods of collecting the data taking into consideration the nature of investigation, objective and scope of the inquiry, financial resources, available time and the desired degree of accuracy. Though the researcher should pay attention to all those factors but much depends upon the ability and experience of the researcher.

7. Execution of the project.

Execution of the project on the correct lines (as decided in research design) is necessary to collect adequate and dependable data. The researcher should see that the project is executed in a systematic manner and in time. If the survey is to be conducted by means of structured questionnaires, data can be readily machine processes. In such a situation, questions as well as the possible answer may be coded. If the data are to be collected through interviewers, arrangements should be made for proper selection and training of the interviewers. The training may be given with the help of instruction manuals which explain clearly the job of the interviewers at each step. Occasional field checks should be made to ensure that the interviewers are doing their assigned job sincerely and efficiently.

8. Analysis of Data:

After collection of data, next step is to analyse them. The analysis of data requires a number of closely related operations such as establishment of categories, the application of these categories to raw data through coding, tabulation and then drawing statistical inferences. The unwieldy data should necessarily be condensed into a few manageable groups and tables for further analysis. Thus, researcher should classify the raw data into some purposeful and usable categories. Coding operation is usually done at this stage through which the categories of data are transformed into symbols that may be tabulated and counted. Editing is the procedure that improves the quality of the data for coding. With coding the stage is ready for tabulation. Tabulation is a part of the technical procedure wherein the classified data are put in the form of tables. The mechanical devices can be made use of at this juncture. A great deal of data, especially in large inquiries, is tabulated by computers. Computers not only save time but also make it possible to study large number of variables affecting a problem simultaneously.

After tabulation we proceed for analysis work which is based on the computation of various percentages, coefficients, etc., by applying various well defined statistical formulae. In the process of analysis, to tests of significance to determine with what validity data can be said to indicate any conclusion(s).

9. Hypothesis Testing:

If there is any hypothesis, the next step is to test it. Various tests, such as Chisquare test, t-test, F-test, have been developed by statisticians for the purpose. The hypothesis may be tested through the use of one or more of such test, depending upon the nature and object of research inquiry. Hypothesis-testing will result in either accepting the hypothesis or in rejecting it. If the researcher had no hypothesis to start with, generalizations established on the basis of data may be stated as hypothesis to be tested by subsequent in times to come.

10. Generalisation and Interpretation:

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

11. Preparation of the Report or the Thesis:

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

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

In its preliminary pages the report should carry title and date followed by acknowledgments and foreword. Then there should be a table of contents followed by a list of tables and list of graphs and charts, if any, given in the report.

(a) Introduction: It should contain a clear statement of the objective of the research and explanation of the methodology in accomplishing the research. The scope of the study along with various limitations should as well as be stated in this part.
(b) Summary of findings: After introduction there would appear a statement of findings and recommendations in nontechnical language. If the findings are extensive, they should be summarized.
(c) Main report: The main body of the report should be presented in logical sequence and broken-down into readily identifiable sections.
(d) Conclusion: Towards the end of the main text, researcher should again put down the results of his research clearly and report, appendices should enlisted in respect of all technical data. Bibliography, i.e., list of books, journals, reports etc., consulted, should also be given the end. Index should also be given specially in a published research report.

(2) Report should be written in a concise and objective style in simple language avoiding vague expressions such as 'it seems', there may be', and the like.
(3) Charts and illustrations in the main report should be used only if they present the information in conducting research operations may as well as be stated.
(4) Calculated 'confidence limits' must be mentioned and the various constraints experienced in conducting research operations may as well be stated.

METHODS OF RESEARCH:

Some important methods of research are given below:

(A) Experimental Method: The experimental method is a matter of logic, not of location. Even so, most experimentation takes place in special laboratories, chiefly because the control of conditions commonly required special equipment that is best housed and used in one place. In experimental method the researcher can control and manipulate the variables.

(B) Observation Method: Careful observation of animal and human behaviour (including the study of our own conscious processes) is the starting point of psychology. Observation is a purposeful, systematic and selective way of matching and listening to an interaction or phenomena as it takes place. Observation of chimpanzees in their native environment of Africa may tell us things about their social organization that will help us conduct our laboratory investigations. Study of pre-literate tribes reveals the ranges of variation in human institutions, which would go unrecognized if we confined our study of men and women of our own culture. Motion pictures of newborn babies reveal the details of movement patterns shortly after birth and the types of stimuli to which babies are responsive.

In making observations of naturally occurring behaviour, anecdotes may be substituted for genuine observations, or interpretations for descriptions. We may tempted, for example, to say that an animal known to have been without food is "looking for food" when all we have observed is heightened activity. Investigators must be trained to observe and record accurately in order to avoid projecting their own wishes or biases into what they report.

(C) Survey Method (Field Studies):

Those problems which are difficult to study by direct observation may be studied through the use of questionnaires or interviews.

Surveys have been used to obtain information, political opinions, consumer preferences, health care needs, and many other topics. The Census is probably the most familiar survey. An adequate survey requires a carefully pre tested questionnaire, a group of interviewers trained in its use, a sample carefully selected to ensure that the responders are representative of the population to be studied, and appropriate methods of data analysis and reporting so that the results are properly interpreted.

(D) Case Studies:

In case study method researcher prepare scientific biographies of individuals. These scientific biographies are known as case histories.

(E) Test Method:

This method is used to measure all kinds of abilities, interests, attitudes, and accomplishments. Tests enable the psychologist to obtain large quantities of data from people with minimum disturbance of their living routines and without elaborate laboratory equipment. A test essentially presents a unimanual dexterity, anxiety, and perceptual skills. An analysis of the results then relates variations in test scores to variations among people. Test construction and use are, however, no simple matters. They involve many steps in item preparation, scaling, and establishing norms.

RESEARCH ETHICS:

In most research studies three parties are involved: the researcher, the user and the subject. The interaction of each of these parties with one or both of the other two parties identifies a series of ethical issues. A number of questions arise because researches believe they have the right to seek information, and subjects believe that they have a certain right to privacy. Just as there are ethical aspects concerning all human interaction, there are some ethical questions about business research. Some of the code of ethics to be followed by the researchers is as given below.

- Researcher should maintain high standards to ensure that the data are accurate.
- Researcher should not intentionally try to prove a particular point.
- Researcher should ensure that the data have been scientifically investigated and his findings are totally objective.
- Researcher should not misrepresent the statistical accuracy of their data, nor should they overstate the significance of the results by altering the findings.
- Researcher should ensure that privacy and anonymity of the respondents.
- Researcher, prior to entering business research, should check for code of ethics set out by their professional associates.

THESIS WRITING

Thesis writing is the final stage of the research. It provides the achievement of detailed knowledge over the problems.

Characteristics of thesis: It has following characteristics:

(a) It is the final stage of the research.
(b) It provides overall view and solution to the problem.
(c) It provides all the elements of the project taken for study to other researchers.
(d) It bears the total summary of the work.
(e) It satisfies all its researchers by providing partial or detailed knowledge over their problems.

Benefits of thesis writing:

(a) The investigator classifies and systematises his work.
(b) The other researchers also may follow same principle.
(c) The students and the educators who could make use of the findings of the investigation.

Considerations in Thesis Writing:

The researcher takes some major considerations which help him writing the report in a very developed way:

(i) What should the general structure of his report be?
(ii) What form should the development, evaluation and organization of his ideas take?
(iii) What language medium should he use for his report?
(iv) What other media can be use for reinforcing his verbal report?
(v) What steps should he take to get it typed correctly?

Format of the Thesis Writing: For the preparation of research report the researcher should follow some steps through which he will be able to make his report a critical and synthetic one.

1. Preliminary section
2. Main Body of the report
3. Reference section

The Preliminary Section:

1. **Title page:** Title page carries the name of the project. It should be clearly typed in capital letters. It should be beautifully printed or typed because it impresses the mind of the readers. It creates a curiosity among them to read the report. It bears the name of the topic, name of the author, the purpose of the study, the name of the institution and data of the presentation.
2. **Certificate:** The format for this page is normally provided the institution which says that it is researcher's original work.
3. **Acknowledgment:** At the time of the study if the researcher has received help and assistance of others, he renders thanks to them. The acknowledgment should be simple in nature.
4. **Table of contents:** He should clearly mention the procedures and steps of preparation of his study in content. In content he also makes his study specific and mentions the pages which hold the length of the chapters of the study. The researcher gets more advantages when go on studying topic.
5. **List of tables:** A statistical analysis is clearer when it is mentioned through tables.

6. **List of Figures:** Examples and points may be given through figures by utilizing Roman numerals like (i), (ii), (iii) etc. In all pages of preliminary section, body of the report, and reference section are numbered with Roman numerals.

Main body: This section may be divided into five divisions:

(a) The first section of the branch introduces the topic. Introduction of the topic may follow the statement of the problem, significance or actual need of the problem for the study, purposes of the study and assumption and limitations. All these steps in introduction of the topic should be carefully defined.

(b) The second section of the study analyses the important literature related to the study. Previous studies if in the area have taken for reviewing. It helps the researcher to make this a significant one.

(c) The third section of the study explains the design of the study. The tools and techniques which are used for making the study smooth and to make the study systematic are described in detail. The source from where the data have been collected and the methods used for collecting data and devices used for collecting data should be clearly mentioned.

(d) It deals with the presentation and analysis of data. It is the most important stage of research project. Through textual discussions and tabular and graphic devices the data are analysed and reported.

(e) It holds the summary and conclusions of the total work. After a critical discussion of the total project, the summary is drawn. It represents the most significant result of the investigation. The summary should be ideal in writing because it makes the readers interested to read whole project.

Reference section:

(a) Reference section of the study occupies a very important place in the research study. Reference followed at the time of study should be arranged in bibliography alphabetically. The title of the author is listed first. The short statement on references should be given for the clear understanding and the actual usefulness.

(b) Appendix is preceded by a sheet containing the word APPENDIX capitalized and centered on the page. Tables and data, questionnaires, tests and other data gathering devices may be placed in the appendix.

(c) Foot-notes-It is very essential in report writing. The research should give a foot-note which will help other researches to follow how it is presented in an explanatory way. These are placed at the bottom of the page.

Intext Referencing and Bibliography:

Intext referencing:

While writing we often use quotations and even paraphrase others views, data, etc. which needs to be acknowledged. When we are quoting or paraphrasing we need to provide the detail in parenthesis in the following manner (Author's last name, Date of Publication, Page No.)

Direct Quotes are written exactly as they appear in the work, in inverted commas, such as:

"Strong interest in general relativity began to be revived starting in the late 1950s, particularly by the Princeton group led by John Wheeler and the London group led by Herman Bondi." (Wald, 1984, 3)

Short quotes (less than 30 words) should be incorporated into your sentence.

Long quotes (more than 30 words) should be indented.

Indirect Quotes do not require inverted commas as one is summarizing or paraphrasing the idea in one's own words. But the referencing is done in the same fashion as in direct quotes.

Bibliography:

When the writing is over, one knows what are the sources consulted during the process of writing. All those sources (books, research papers, articles, websites, etc.) need to be put in a sequence in the bibliography. It is usually the practice to list out the books, first, then the periodicals, articles and then the web materials.

The word "bibliography" comes from the Greek word '*bibliographia'* which meant the copying of books by hand. Later, during the middle ages, the term was used to signify any intellectual activity of composing books. The way in which it is used today is a contribution of the 17th century where bibliography has been expanded to include any studies that consider the book as a material object.

Below is the list with examples of how to make the bibliography.

Books:
Author's last name, first initial. (Publication date).*Book title.*Additional information. City of publication: Publishing Company.

Single Author:
Feller, W., (1968). An Introduction to Probability Theory and its Application. New York: Wiley.
Pettijohn, F. J., (1957). *Sedimentary Rocks* [2nd ed.]. New York: John Wiley & Sons.

Multiple Authors:
Leakey, L. S. B., Prost, J., and Prost, S., (1971). *Adam or Ape: A Sourcebook of Discoveries about Early Man*, Cambridge: Schenkman Publishing Company.

(Note how in the case of more than one authors, only the first author's name is reversed with the surname coming first. The names of other authors follow the convention of first name/s , followed by surname.)

Edited Book:
Mooney, H. A., and J. A. Drake, ed. (1986). *Ecology of Biological Invasions of North America and Hawaii*. New York: Springer-Verlag.

Government Report:
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SOME IMPORTANT TERMS:
- **Paper:** A Written material specially created for specialized audience or readers is known as paper.
- **Article:** A written material for general audience or reader is known as article.
- **Workshop:** A training programme is known as workshop.
- **Seminar:** Formal meeting where the participants put forward their finding.
- **Conference:** Formal meeting where the number of audience is much more than the number of participants.
- **Symposium:** A formal meeting or discussion between the persons of same educational level.

Application of ICT in Research

The field of education and research has been developing for centuries along with the development of science and technology. As technology carried on developing so did the field of research as both of them are entangled to each other in manifold ways. In this part of the chapter we will be dealing with the Role of Information and Communication Technology in Research.

The first revolution came to the field of education when printing press was invented as it provided the people with the basic aid of teaching learning process – the book. A more and yet significant addition to the teaching learning process is the revolution in the Information and Communication technology which has opened frontiers of knowledge gaining and dissemination processes available to the people because of its myriad nature.

In the unit on Teaching Aptitude we have already seen how Information and Communication technology has created a revolution in all fields of our lives such as — e-mails, e-commerce, e-marketing, e-books, e-shopping, e-governance, e-health, e-exam, e-banking, e- interview, e-learning, so on and so forth.

Similarly ICT also has been much more beneficial to the researches in various ways –

(a) E-mail – During Research, communication with fellow scholars and experts in the respective fields become very necessary and in today's world e-mail has done the job of communication much easier and faster leading to a great relief to the researchers.

(b) Document Exchange – During Research it is essential that we get as much of related documents to our area of research as possible. this has been made possible because of internet which facilities the sharing of documents amongst researches and experts.

(c) E-journals – In earlier times, researchers had to spend a vast amount of their time looking for relevant journal publications in different libraries which would take away much of their time and energy, but with the ICT it has become easier for the researchers to look at e-journals not only to find out the relevant publication for their research; but also to publish their own researches.

(d) E-books – Physical books are significant in terms of having a different reading experience; but these days with the arrival of e-books it has become very easy to access books any time at any place in one's handheld devices which has made to easier to access books. It has helped immensely in Research activities as e-books are easy to procure and easy to access.

(e) Locate, Collect data using internet – Data and its location and collection is very significant for any research as one cannot think of doing a proper research without sufficient data. With the advent of the internet it has become very easy to access different sort of data at the earliest which have been much helpful in carrying out research activities. There are many online databases which are often significant in figuring out secondary data while doing research.

Some of the e-tools for data collection –

- http://www.google.com/forms/about/
- http://www.surveygizmo.com/
- https://www.surveymonkey.com/
- http://www.project-redcap.org/

(f) Blogging/ Teleconferencing/Videoconferencing – These are also different methods of communication which are open to researchers to communicate the research and to have discussion with fellow researchers and experts those who probably live miles away from each other leading to much ease in doing research. In the present age, because of the development of the communication technologies based on the internet it has really become easier and faster to communicate research areas and interests with people across the world to find faster solution to research problems.

(g) Literature survey – Literature survey is one of the basic elements of any research activities. Before one undertakes any research question or problem it becomes essential for the researcher to figure out what kind of researches have already been done on the related topic. with the advent of the internet it has become easier for the researcher to figure out easily what kind of researches are going on and what kind of literature already exists on a particular topic. In earlier days, a researcher had to work hard for determining the literature survey but these days because of the advent of the internet it has become a much easy job.

Here is a list of different sites that one can look for while doing literature survey –

1. http://www.freefullpdf.com/

2. https://archive.org/
3. http://www.elsevier.com/about/open-access/open- access-journals
4. http://www.sciencedirect.com/science/jrnlallbooks/ all/open-access
5. http://www.nbrc.ac.in/library/free_journals.htm
6. http://124.124.221.7/AccessDetails.php
7. http://doaj.org/
8. http://journals.cambridge.org/action/browseFreeContent
9. http://www.e-journals.org/
10. http://jstor.org/

Here are some of the examples of Indexing database services Repositories

- http://shodhganga.inflibnet.ac.in/
- http://repository.lib.ncsu.edu/ir/handle/1840.16/1
- http://ir.lib.uwo.ca/do/search/?q=education&start=0&context=686929
- http://scholarlyrepository.miami.edu/etds/
- http://digitool.library.colostate.edu/R/
- http://repositories.lib.utexas.edu/handle/2152/

(h) Plagiarism and Grammar Check: Often while writing a research paper or a thesis we knowingly or unknowingly fall into the trap of plagiarism which is often considered as an academic offence. Therefore it has become almost mandatory to do a Plagiarism Check before submission of any research report so that we can produce clean research and no one can state that the research is in any way a reproduction of whatever has been existing earlier. For the purpose, we can get the help of different softwares which are often used by different institutions.

Apart from the Plagiarism, we also need to write grammatically right sentences so as to make perfect sense and also to make it appear to the world that we have done serious research. Even if a research is done with all seriousness and the report of it is not written with utmost attention then it can lead to a situation when people may come to the view that the research was not done properly. So it is better that we get help of the following websites to do away with Grammar problems and plagiarism from our research report.

The following Websites can be helpful for that purpose –

- www.grammarly.com
- http://www.paperrater.com/plagiarism_checker
- http://www.reverso.net/text_translation.aspx?lang=EN
- http://www.gingersoftware.com/grammarcheck
- http://www.plagscan.com/
- http://www.ithenticate.com/products/plagiarism-checker-for-authors-and-researchers/

(i) Presentation – Presentation of research before an audience is a must when one does research as any research is not an isolated activity but an attempt to contribute to the pool of knowledge. SO as soon as a research is complete there is a need to present the research before a gathering of scholars not only to disseminate it but also to find out opinions about it. there are a few websites which help in this process. some of them are –

- http://www.posterpresentations.com/
- http://www.postergenius.com/cms/index.php

(j) Some of the other significant resources of MOOCs are

- https://www.coursera.org/course/researchmethods
- http://www.ocw.mit.edu/
- http://www.scoop.it/t/mooc-course-sites
- https://www.edx.org/

(k) Some Search Engines & Apps for Researchers are

- http://www.teachthought.com/technology/100-search-engines-for- academic-research/
- http://libguides.mit.edu/content.php?pid=174869&sid=1481864
- http://connectedresearchers.com/online-tools-for-researchers/
- http://oedb.org/ilibrarian/best-online-research-sites/
- http://www.hhmi.org/biointeractive/vlabs/
- http://virtuallabs.stanford.edu

RESEARCH ETHICS

The term "ethics" is derived from the Greek word "ethos" which refers to charter or customs or accepted behaviours. **The Oxford Dictionary states ethics as "the moral principle that governs a person's behavior or how an activity is conducted".** Ethics is a set of principles or standard of human code of conduct that govern the behavior of individuals or society. 'Code of conduct' is a set of principle and expectations that are considered binding on any person. Research ethics refers 'code of conduct' which researcher are expected follow while research on project. Research ethics comprises the principles and standards that guide behavior in the conduct of research. Researcher involves human and social subjects which raises unique and complex ethical, legal, social and political issue. Research ethics provide guidance and code of conduct which follow scholar to create new idea and knowledge for society and human being.

Element of Research Ethics

A strong of Code of Ethics: Researcher have object create new knowledge and idea which strong code of conduct help and provide guide how to achieve their objective.

Ethics Training: Researcher need to have sufficient experience and training for complete research project which get by research guide and course work.

Ethics as a Guide: Researcher need to have sufficient expertise in ethical concepts, analytical skill and decision making tool to facilitate an ethical resolution to the problem. Ethics provide assurance of confidently and direction for resolution of the problem.

Multiple Choice Questions (MCQ)

1. A teacher is writing his / her daily observations of a student and writes, without interpretation, that the student is not completing the class work and is constantly speaking out of turn. Which of the following objectives does he / she appear to be using?
(a) prediction (b) description (c) explanation (d) exploration

2. Which of the following is a form of research typically conducted by teachers, counselors, and other professionals to answer questions they have and to specifically help them solve local problems?
(a) action research (b) basic research
(c) predictive research (d) orientational research

3. How much confidence should you place in a single research study?
(a) you should completely trust a single research study.
(b) you should trust research findings after different researchers have found the same findings
(c) neither a nor b
(d) both a and b

4. The development of a solid foundation of reliable knowledge typically is built from which type of research?
(a) basic research (b) action research
(c) evaluation research (d) orientational research

5. Which form of reasoning is the process of drawing a specific conclusion from a set of premises?
(a) rationalism (b) deductive reasoning
(c) inductive reasoning (d) probabilistic

6. The idea that when selecting between two different theories with equal explanatory value, one should select the theory that is the most simple, concise, and succinct is known as _____.
(a) criterion of falsifiability (b) critical theory
(c) guide of simplicity (d) rule of parsimony

7. Research that is done to examine the findings of someone else using the "same variables but different people" is which of the following?
(a) exploration (b) hypothesis (c) replication (d) empiricism

8. _____ is the idea that knowledge comes from experience.
(a) rationalism (b) deductive reasoning
(c) logic (d) empiricism

9. According to you, what are the five key objectives of science?
(a) prediction, summary, conclusion, explanation, description
(b) influence, prediction, questions, exploration, answers
(c) exploration, description, explanation, prediction, influence
(d) questions, answers, prediction, explanation, summary

10. A researcher designs an experiment to test how variables interact to influence how well children learn spelling words. In this case, the main purpose of the study was:
(a) Explanation (b) Description (c) influence (d) Prediction

11. There is a set of churches in the U.S. where part of the service involves snake handling. The researcher wants to find out why the people attending these churches do this and how they feel and think about it. In this case, the primary purpose of the study is:
(a) Exploration (b) Description (c) Influence (d) Prediction

12. Which of the following is not a characteristic of a good theory or explanation?
(a) It is parsimonious (b) It is testable
(c) It is general enough to apply to more than one place, situation, or person
(d) All of the above are characteristics of good theories

13. Which of the following is not a basic assumption of science?
(a) Science cannot provide answers to all questions
(b) It is possible to distinguish between more and less plausible claims
(c) Researchers should follow certain agreed upon norms and practices
(d) Science is best at solving value conflicts, such as whether abortion is immoral

14. What general type of research is focused on collecting information to help a researcher advance an ideological or political position?
(a) Evaluation research (b) Basic research
(c) Action research (d) Orientational research

15. Which "scientific method" follows these steps: 1) observation/data, 2) patterns, 3) theory?
(a) Inductive (b) Deductive (c) Inductive (d) Top down

16. Rene Descartes is associated with which of the following approached to knowledge generation?
(a) Empiricism (b) Rationalism (c) Expert opinion (d) None of the above

17. Which scientific method is a top-down or confirmatory approach?
(a) Deductive method (b) Inductive method
(c) Hypothesis method (d) Pattern method

18. Which scientific method is a bottom-up or generative approach to research?
(a) Deductive method (b) Inductive method
(c) Hypothesis method (d) Pattern method

19. Which scientific method focuses on testing hypotheses developed from theories?
(a) Deductive method (b) Inductive method
(c) Hypothesis method (d) Pattern method

20. Which scientific method often focuses on generating new hypotheses and theories?
(a) Deductive method (b) Inductive method
(c) Hypothesis method (d) Pattern method

21. Which of the following statements is true of a theory?
(a) it most simply means "explanation"
(b) it answers the "how" and "why" questions
(c) it can be a well developed explanatory system
(d) all of the above are correct

22. Which research paradigm is based on the pragmatic view of reality?
(a) quantitative research (b) qualitative research
(c) mixed research (d) none of the above

23. Which research paradigm is least concerned about generalizing its findings?
(a) quantitative research (b) qualitative research
(c) mixed research (d) none of the above

24. Which of the following best describes quantitative research?
(a) the collection of nonnumerical data
(b) an attempt to confirm the researcher's hypotheses
(c) research that is exploratory
(d) research that attempts to generate a new theory

25. A condition or characteristic that can take on different values or categories is called ___.
(a) a constant
(b) a variable
(c) a cause-and-effect relationship
(d) a descriptive relationship

26. A variable that is presumed to cause a change in another variable is called a(n):
(a) categorical variable
(b) dependent variable
(c) independent variable
(d) intervening variable

27. All of the following are common characteristics of experimental research except:
(a) it relies primarily on the collection of numerical data
(b) it can produce important knowledge about cause and effect
(c) it uses the deductive scientific method
(d) it rarely is conducted in a controlled setting or environment

28. Qualitative research is often exploratory and has all of the following characteristics except:
(a) it is typically used when a great deal is already known about the topic of interest
(b) it relies on the collection of nonnumerical data such as words and pictures
(c) it is used to generate hypotheses and develop theory about phenomena in the world
(d) it uses the inductive scientific method

29. Which type of research provides the strongest evidence about the existence of cause-and-effect relationships?
(a) nonexperimental Research
(b) experimental Research
(c) Analytical researcher
(d) None of these

30. What is the key defining characteristic of experimental research?
(a) extraneous variables are never present
(b) a positive correlation usually exists
(c) a negative correlation usually exists
(d) manipulation of the independent variable

31. In _____, random assignment to groups is never possible and the researcher cannot manipulate the independent variable.
(a) basic research
(b) quantitative research
(c) experimental research
(d) causal-comparative and correlational research

32. What is the defining characteristic of inferential research?
(a) resistance to manipulation
(b) manipulation of the independent variable
(c) the use of open-ended questions
(d) focuses only on local problems

33. A positive correlation is present when _____.
(a) two variables move in opposite directions.
(b) two variables move in the same direction.
(c) one variable goes up and one goes down
(d) several variables never change.

34. Research in which the researcher uses the qualitative paradigm for one phase and the quantitative paradigm for another phase is known as _____.
(a) action research
(b) basic research
(c) quantitative research
(d) mixed method research

35. Research in which the researcher uses both qualitative and quantitative research within a stage or across two of the stages in the research process is known as _____.
(a) action research (b) basic research
(c) quantitative research (d) mixed model research

36. Research that is done to understand an event from the past is known as _____?
(a) experimental research (b) historical research
(c) replication (d) archival research

37. _____ research occurs when the researcher manipulates the independent variable.
(a) causal-comparative research (b) experimental research
(c) ethnography (d) correlational research

38. Which of the following includes examples of quantitative variables?
(a) age, temperature, income, height
(b) grade point average, anxiety level, reading performance
(c) gender, religion, ethnic group
(d) both (a) and (b).

39. What is the opposite of a variable?
(a) a constant (b) an extraneous variable
(c) a dependent variable (d) a data set

40. Which of the following is the type of nonexperimental research in which the primary independent variable of interest is categorical?
(a) causal-comparative research (b) experimental research
(c) qualitative research (d) mixed research

41. Which of the following can best be described as a categorical variable?
(a) age (b) annual income
(c) grade point average (d) religion

42. In research, something that does not "vary" is called a _____.
(a) variable (b) method (c) constant (d) control group

43. When interpreting a correlation coefficient expressing the relationship between two variables, it is very important to avoid _____.
(a) checking the strength of relationship
(b) jumping to the conclusion of causality
(c) checking the direction of the relationship
(d) expressing a relationship with a correlation coefficient

44. A researcher studies achievement by children in poorly funded elementary schools. She develops a model that posits parent involvement as an important variable. She believes that parent involvement has an impact on children by increasing their motivation to do school work. Thus, in her model, greater parent involvement leads to higher student motivation, which in turn creates higher student achievement. Student motivation is what kind of variable in this study?
(a) Manipulated variable (b) Extraneous variable
(c) Confounding variable (d) Mediating or intervening variable

45. The strongest evidence for causality comes from which of the following researchmethods?
(a) Experimental (b) Causal-comparative
(c) Correlational (d) Ethnography

46. Which correlation is the strongest?
(a) +.10 (b) -.95 (c) +.90 (d) -1.00

47. The correlation between intelligence test scores and grades is:
(a) Positive (b) Negative (c) Perfect (d) They are not correlated

48. According to you, how many points should a rating scale have?
(a) Five (b) Four (c) Ten (d) Somewhere from 4 to 11 points

49. What is the problem(s) with this set of response categories to the question "What is your current age?"
1-5
5-10
10-20
20-30
30-40
(a) The categories are not mutually exclusive
(b) The categories are not exhaustive
(c) Both a and b are problems
(d) There is no problem with the above set of response categories

50. You should mix methods in a way that provides complementary strengths and nonoverlapping weaknesses. This is known as the fundamental principle of mixed research.
(a) Mixed research (b) Exploratory research (c) Case study (d) None of these

51. Questionnaires can address events and characteristics taking place when?
(a) In the past (retrospective questions)
(b) In the present (current time questions)
(c) In the future (prospective questions)
(d) All of the above

52. Which of the following are principles of questionnaire construction?
(a) Consider using multiple methods when measuring abstract constructs
(b) Use multiple items to measure abstract constructs
(c) Avoid double-barreled questions
(d) All of the above

53. Which of these is not a method of data collection?
(a) Questionnaires (b) Interviews
(c) Experiments (d) Observations

54. Secondary/existing data may include which of the following?
(a) Official documents (b) Personal documents
(c) Archived research data (d) All of the above

55. An item that directs participants to different follow-up questions depending on their response is called a _____.
(a) Response set (b) Probe
(c) Semantic differential (d) Contingency question

56. Which of the following terms best describes data that were originally collected at an earlier time by a different person for a different purpose?
(a) Primary data (b) Secondary data
(c) Experimental data (d) Field notes

57. Researchers use both open-ended and closed-ended questions to collect data. Which of the following statements is true?
(a) Open-ended questions directly provide quantitative data based on the researcher's predetermined response categories
(b) Closed-ended questions provide quantitative data in the participant's own words
(c) Open-ended questions provide qualitative data in the participant's own words
(d) Closed-ended questions directly provide qualitative data in the participants' own words

58. Open-ended questions provide primarily _____ data.
(a) Confirmatory data (b) Qualitative data
(c) Predictive data (d) None of the above

59. Which of the following is true concerning observation?
(a) It takes less time than self-report approaches
(b) It costs less money than self-report approaches
(c) It is often not possible to determine exactly why the people behave as they do
(d) All of the above

60. Qualitative observation is usually done for exploratory purposes; it is also called _____ observation.
(a) Structured (b) Naturalistic (c) Complete (d) Probed

61. When constructing a questionnaire it is important to do each of the following except _____.
(a) Use "leading" or "loaded" questions (b) Use natural language
(c) Understand your research participants (d) Pilot your test questionnaire

62. Another name for a Likert Scale is a(n):
(a) Interview protocol (b) Event sampling
(c) Summated rating scale (d) Ranking

63. Which of the following is not one of the six major methods of data collection that are used by educational researchers?
(a) Observation (b) Interviews (c) Questionnaires (d) Checklists

64. The type of interview in which the specific topics are decided in advance but thesequence and wording can be modified during the interview is called:
(a) The interview guide approach (b) The informal conversational interview
(c) A closed quantitative interview (d) The standardized open-ended interview

65. Which one of the following in not a major method of data collection:
(a) Questionnaires (b) Interviews (c) Secondary data
(d) All of the above are methods of data collection

66. A question during an interview such as "Why do you feel that way?" is known as a:
(a) Probe (b) Filter question (c) Response (d) Filler question

67. A census taker often collects data through which of the following?
(a) Standardized tests (b) Interviews (c) Secondary data (d) Observations

68. The researcher has secretly placed him or herself (as a member) in the group that is being studied. This researcher may be which of the following?
(a) A complete participant (b) An observer-as-participant
(c) A participant-as-observer (d) None of the above

69. Which of the following is not a major method of data collection?
(a) Questionnaires (b) Focus groups
(c) Correlational method (d) Secondary data

70. Which type of interview allows the questions to emerge from the immediate context or course of things?
(a) Interview guide approach (b) Informal conversational interview
(c) Closed quantitative interview (d) Standardized open-ended interview

71. When conducting an interview, asking "Anything else?, What do you mean?, Why do you feel that way?," etc, are all forms of:
(a) Contingency questions (b) Probes
(c) Protocols (d) Response categories

72. When constructing a questionnaire, there are certain principles to which you should adhere. Which of the following is not one of those principles?
(a) Do not use "leading" or "loaded" questions
(b) Avoid double-barreled questions
(c) Avoid double negatives
(d) Avoid using multiple items to measure a single construct.

73. When each member of a population has an equally likely chance of being selected, this is called:
(a) A nonrandom sampling method (b) A quota sample
(c) A snowball sample (d) An Equal probability selection method

74. Which of the following techniques yields a simple random sample?
(a) Choosing volunteers from an introductory psychology class to participate
(b) Listing the individuals by ethnic group and choosing a proportion from withineach ethnic group at random.
(c) Numbering all the elements of a sampling frame and then using a random number table to pick cases from the table.
(d) Randomly selecting schools, and then sampling everyone within the school.

75. Which of the following is not true about stratified random sampling?
(a) It involves a random selection process from identified subgroups
(b) Proportions of groups in the sample must always match their population proportions
(c) Disproportional stratified random sampling is especially helpful for getting large enough subgroup samples when subgroup comparisons are to be done
(d) Proportional stratified random sampling yields a representative sample

76. Which of the following statements are true?
(a) The larger the sample size, the greater the sampling error
(b) The more categories or breakdowns you want to make in your data analysis, the larger the sample needed
(c) The fewer categories or breakdowns you want to make in your data analysis, the larger the sample needed
(d) As sample size decreases, so does the size of the confidence interval.

77. Which of the following formulae is used to determine how many people to include in the original sampling?
(a) Desired sample size/Desired sample size + 1
(b) Proportion likely to respond/desired sample size
(c) Proportion likely to respond/population size
(d) Desired sample size/Proportion likely to respond

78. Which of the following sampling techniques is an equal probability selection method (i.e., EPSEM) in which every individual in the population has an equal chance of being selected?
(a) Simple random sampling (b) Systematic sampling
(c) Cluster sampling using the PPS technique (d) All of the above are EPSEM

79. Which of the following is not a form of nonrandom sampling?
(a) Snowball sampling
(b) Convenience sampling
(c) Quota sampling
(d) They are all forms of nonrandom sampling

80. Which of the following will give a more "accurate" representation of the population from which a sample has been taken?
(a) A large sample based on the convenience sampling technique
(b) A small sample based on simple random sampling
(c) A large sample based on simple random sampling
(d) A small cluster sample

81. Sampling in qualitative research is similar to which type of sampling in quantitative research?
(a) Simple random sampling (b) Systematic sampling
(c) Quota sampling (d) Purposive sampling

82. Which of the following would generally require the largest sample size?
(a) Cluster sampling (b) Simple random sampling
(c) Systematic sampling (d) Proportional stratified sampling

83. How often does the Census Bureau take a complete population count?
(a) Every year (b) Every five years (c) Every ten years (d) Twice a year

84. People who are available, volunteer, or can be easily recruited are used in the sampling method called _____.
(a) Simple random sampling (b) Cluster sampling
(c) Systematic sampling (d) Convenience sampling

85. Which of the following types of sampling involves the researcher determining theappropriate sample sizes for the groups identified as important, and then taking convenience samples from those groups?
(a) Proportional stratified sampling (b) Quota sampling
(c) One-stage cluster sampling (d) Two-stage cluster sampling

86. A type of sampling used in qualitative research that involves selecting cases that disconfirm the researcher's expectations and generalizations is referred to as _____.
(a) Extreme case sampling (b) Typical-case sampling
(c) Critical-case sampling (d) Negative-case sampling

87. Philosophical research is also known as
(a) Empirical (b) Action (c) Basic (d) Conceptual

88. In which of the following nonrandom sampling techniques does the researcher ask the research participants to identify other potential research participants?
(a) Snowball (b) Convenience (c) Purposive (d) Quota

89. Which of the following is the most efficient random sampling technique?
(a) Simple random sampling (b) Proportional stratified sampling
(c) Cluster random sampling (d) Systematic sampling

90. If we took the 500 people attending a school in New Delhi, divided them by gender, and then took a random sample of the males and a random sampling of the females, the variable on which we would divide the population is called the _____.
(a) Independent variable (b) Dependent variable
(c) Stratification variable (d) Sampling variable

91. A number calculated with complete population data and quantifies a characteristic of the population is called which of the following?
(a) A datum (b) A statistic (c) A parameter (d) A population

92. The type of sampling in which each member of the population selected for the sample is returned to the population before the next member is selected is called _____.
(a) Sampling without replacement (b) Sampling with replacement
(c) Simple random sampling (d) Systematic sampling

93. Which of the following is not a type of nonrandom sampling?
(a) Cluster sampling (b) Convenience sampling
(c) Quota sampling (d) Purposive sampling

94. Which of the following would usually require the smallest sample size because of its efficiency?
(a) One stage cluster sampling (b) Simple random sampling
(c) Two stage cluster sampling (d) Quota sampling

95. A technique used when selecting clusters of different sizes is called _____.
(a) Cluster sampling (b) One-stage sampling
(c) Two-stage sampling (d) Probability proportional to size or PPS

96. The process of drawing a sample from a population is known as _____.
(a) Sampling (b) Census
(c) Survey research (d) None of the above

97. It is recommended to use the whole population rather than a sample when the population size is of what size?
(a) 500 or less (b) 100 or less
(c) 1000 or less (d) you should always use a sample

98. Which of the following is not an example of a nonrandom sampling technique?
(a) Purposive (b) Quota (c) Convenience (d) Systematic

99. Which of the following sampling methods is the best way to select a group of people for a study if you are interested in making statements about the larger population?
(a) Convenience sampling (b) Quota sampling
(c) Purposive sampling (d) Random sampling

100. _____ is a set of elements taken from a larger population according to certain rules.
(a) Sample (b) Population (c) Statistic (d) Element

101. Determining the sample interval (represented by k), randomly selecting a number between 1 and k, and including each k^{th} element in your sample are the steps for which form of sampling?
(a) Simple Random Sampling (b) Stratified Random Sampling
(c) Systematic Sampling (d) Cluster sampling

102. The nonrandom sampling type that involves selecting a convenience sample from a population with a specific set of characteristics for your research study is called _____.
(a) Convenience sampling (b) Quota sampling
(c) Purposive sampling (d) Snowball sampling

103. A researcher was interested in studying why the "new math" of the 1960s failed. She interviews several teachers who used the new math during the 1960s. These teachers are considered:
(a) Primary sources (b) Secondary Sources
(c) External critics (d) Internal critics

104. The process of dealing with concerns over the authenticity of a source is referred to as:
(a) Sourcing (b) Internal criticism
(c) Secondary criticism (d) External criticism

105. A researcher studying the history of medical education finds a manuscript that purports to be from the 14^{th} century. Before he uses the source, he goes to three other experts who help him identify whether the manuscript is authentic or not. His authentification of the object is referred to as:
(a) Positive criticism (b) Internal criticism
(c) Secondary criticism (d) External criticism

106. Which of the following is not a source of primary data?
(a) observation (b) Journals (c) Schedules (d) Interview

107. A researcher is interested in studying approaches to teaching writing in schools during the 1800s. She discovers a grammar book, but there is no author or copyright date in the book. She examines the typeface in the book as well as the writing style. After investigating further, she finds a reference to the book from a teacher's diary from the 1800s. The diary also mentions an author's name. After further searching around she is able to identify the author of the book. The investigator was engaged in what process?
(a) Sourcing (b) Positive criticism (c) Presentism (d) Axial coding

108. Historical research is conducted for which of the following reasons?
(a) To identify the relationship that the past has to the present
(b) To evaluate and record accomplishments of individuals or entities
(c) To enhance understanding of the culture in which we live
(d) To uncover the unknown
(e) All of the above

109. The following is a step in the process of historical research?
(a) Preparing a report or narrative exposition
(b) Identifying a research topic and formulation of the research problem or question
(c) Data synthesis (d) All of the above

110. Oral histories can be based on _____.
(a) Interviews with people (b) Stories and tales
(c) Songs (d) All of the above

111. In historical research, a primary source _____.
(a) Consists of firsthand accounts by witnesses to events
(b) Can consist of sources that include original maps, diaries, transcripts of the minutes of a meeting, and photographs
(c) Both a and b
(d) None of these

112. In evaluating historical research sources, external criticism _____.
(a) Can involve the use of carbon dating and handwriting experts
(b) Helps determine the validity, trustworthiness or authenticity of a source
(c) Can involve use of historical linguists' knowledgeable with the writing style of the period
(d) All of the above

113. The process of determining the reliability or accuracy of the information contained in the sources collected is known as _____.
(a) External criticism (b) Internal criticism (c) Vagueness (d) Presentism

114. Presentism in historical sources _____.
(a) Is the presence of the author in a historical source
(b) Is a first-hand accounts of events
(c) Is the assumption that the present-day connotations of terms also existed in the past
(d) Is the assumption that the past influences the present

115. "Comparing document to each other to determine whether they provide the same information or reach the same conclusion" is known as _____.
(a) Contextualization (b) Sourcing
(c) Corroboration (d) Negative criticism

116. Three heuristics suggested by Wineburg (1991) for evaluating documents are:
(a) Corroboration, sourcing, and contextualization
(b) Sourcing, internal criticism, and external criticism
(c) Corroboration, internal criticism and external criticism
(d) Contextualization, corroboration and presentism

117. When writing their narratives, many historical researchers prefer to use _____.
(a) The Publication Manual of the American Psychological Association (1994)
(b) The Chicago Manual of Style
(c) The Historical Manual of Style
(d) The Historian's Manual of Style

118. When a citation includes more than ____ authors, only the surname of the first author is cited followed by et al.
(a) 3 (b) 4 (c) 5 (d) 6

119. Which of the following abbreviations can be used in a research report?
(a) i.e. (b) sec. for second (c) yr. for year (d) mo. for month

120. Editorial style specifies that _____ should be used infrequently or sparingly.
(a) Italics (b) Abbreviations (c) Headings (d) Both a and b

121. The factor that should determine whether you decide to prepare a research report of your study for a conference or for publication is
(a) Whether the study is free from flaws
(b) Whether the study is important enough to justify presentation or publication
(c) Whether others would be interested in the work
(d) All of the above

122. Which of the following is ***NOT*** true about the use of language in research reports?
(a) You should choose accurate and clear words that are free from bias.
(b) You should avoid labeling people whenever possible
(c) You should avoid using the term "subjects" whenever possible
(d) All of the above are true according to the APA Guidelines

123. It is in this section that you fully interpret and evaluate your results.
(a) Introduction (b) Method (c) Results (d) Discussion

124. Where do you provide a step-by-step account of what the researcher and participants did during the research study?
(a) Introduction (b) Abstract (c) Procedure (d) Design

UNIT – (II) Research Aptitude (Answer Key)

1. (b)	**2. (a)**	**3. (b)**	**4. (a)**	**5. (b)**	**6. (d)**	**7. (c)**
8. (d)	**9. (c)**	**10. (a)**	**11. (a)**	**12. (d)**	**13. (d)**	**14. (d)**
15. (a)	**16. (b)**	**17. (a)**	**18. (b)**	**19. (a)**	**20. (b)**	**21. (d)**
22. (c)	**23. (b)**	**24. (b)**	**25. (b)**	**26. (c)**	**27. (d)**	**28. (a)**
29. (b)	**30. (d)**	**31. (d)**	**32. (a)**	**33. (b)**	**34. (d)**	**35. (d)**
36. (b)	**37. (b)**	**38. (d)**	**39. (a)**	**40. (a)**	**41. (d)**	**42. (c)**
43. (b)	**44. (d)**	**45. (a)**	**46. (d)**	**47. (a)**	**48. (d)**	**49. (c)**
50. (a)	**51. (d)**	**52. (d)**	**53. (c)**	**54. (d)**	**55. (d)**	**56. (b)**
57. (c)	**58. (b)**	**59. (c)**	**60. (b)**	**61. (a)**	**62. (c)**	**63. (d)**
64. (a)	**65. (d)**	**66. (a)**	**67. (b)**	**68. (a)**	**69. (c)**	**70. (b)**
71. (b)	**72. (d)**	**73. (d)**	**74. (c)**	**75. (b)**	**76. (b)**	**77. (d)**
78. (d)	**79. (d)**	**80. (c)**	**81. (d)**	**82. (a)**	**83. (c)**	**84. (d)**
85. (b)	**86. (d)**	**87. (d)**	**88. (a)**	**89. (b)**	**90. (c)**	**91. (c)**
92. (b)	**93. (a)**	**94. (b)**	**95. (d)**	**96. (a)**	**97. (b)**	**98. (d)**
99. (d)	**100. (a)**	**101. (c)**	**102. (c)**	**103. (a)**	**104. (d)**	**105. (d)**
106. (b)	**107. (a)**	**108. (e)**	**109. (d)**	**110. (d)**	**111. (c)**	**112. (d)**
113. (b)	**114. (c)**	**115. (c)**	**116. (a)**	**117. (b)**	**118. (d)**	**119. (a)**
120. (d)	**121. (d)**	**222. (d)**	**123. (d)**	**124. (c)**		