

1. a) Research is defined as the process of creating or work on data that does not exist yet.

According to Redman and many research means systematic effort of providing new knowledge.

The importance of Research are

- 1] Exploratory or Formulative research studies
- 2] Descriptive research studies
- 3] Diagnostic research studies
- 4] Hypothesis-testing research studies

The objectives of Research are

1] Understanding: In this, we try to understand the research that we are going to do i.e., [choose a topic].

2] Problem Solving: In this, we perform the ~~problem~~ problem solving technique.

3] Analytical: In this, we perform analytics on the research we are working on.

4] Collaboration: In this, we collaborate with other research specialists for a collaborative research work.

5] Education: In this, education is an important objective of research work. Here, education is important to understand and work in the field of research.

1.6) The different types of engineering research are

1] Descriptive Research:

In this type of research, we try to describe the concepts and terms that we are working on in a research.

2] Analytical Research:

In this type of research, we perform analytical techniques in the field of research we are working on.

3] Applied Research:

In this type of research, we apply some research that already exists in the field of research.

4] Fundamental Research:

In this type of research, we use the basics of the research. Applied research may include the research of Fundamental research but ^(standing procedure) vice versa is not possible.

5] Quantitative Research:

In this type of research, we use statistical approach of hypothesis testing in the research.

6] Qualitative Research:

In this type of research, we use qualitative approach in the research.

7] Conceptual Research:

In this type of research, we use concepts of some topics in the research.

3] Empirical Research:

In this type of research, empirical research includes past experience or previous data observations in the research.

3. a) Applied research is the type of research which includes some predefined research has been applied in the research.

Fundamental research is the type of research which includes we use the fundamentals or basics (starting procedure) in the research.

Applied research may include the information or data from Fundamental research but the vice versa is not possible.

For example, Fundamental research includes addition, subtraction, multiplication and division as they are the basic foundations of Mathematics.

For Applied research, we can consider Pythagoras Theorem and other mathematical derivations which includes the same applied research as its examples.

3. b) The factors that motivate to do engineering research are

1] Intrinsic factors that includes feel happy when you contribute to a research.

2] Extrinsic research factors that provide you money on extrinsic research works.

3] Personal Motivations includes chasing energy, high frequency happiness

Research done at a higher level also provides good money and makes them rich and famous.

5.a) (i) Fabrication:

In this, we collect the information or data that does not exist yet. The information or data that is organised and collected may not exist yet. This is termed as Fabrication.

Fabrication in simple words means the information or data that is gathered does not exist yet.

(ii) Plagiarism:

Plagiarism means the copying of research that already exists and also not mentioning the authorship details from whom the research has been copied.

The replication (copy) of the entire research that already exists into his/her research without contributing his/her authorship details. This is termed as Plagiarism.

It is a wrong and punishable act to copy the research of the already existing research.

5.b) Mathematics and algorithms always need to be included in the research.

Mathematics and algorithms are considered as the basics in any research.

We often use Mathematics and algorithms in deriving theorems.

Mathematics and algorithms are important and skimming is less used.

We can integrate these mathematics and algorithms in programming languages like C, C++ and Java that are prone to errors.

Even the researcher feels that the methods and code he has used is correct. There are a fair chance that it would be incorrect. So the researchers instead of perfection

use quicker methods to go through the implementation. Thus, mathematics and algorithms are related to the research process.

10.a) Reading a datasheet includes skimming, i.e., going through the research in a faster way.

It's contents are useful for the civil and mechanical engineering for studying through the drawings and graphs. Reading a datasheet is also used ~~in electronics~~ in the field of electronics.

It's contents are useful in truth tables in determining the output based on the inputs provided. It is useful in analyzing the pairs of inputs and also determine the output.

Reading a datasheet are useful in learning mathematical derivations.

10.b) The primary goal of conducting a literature review in academic research is to have the author information. A literature should include only few information that ~~are~~ already exists.

A literature should not include any already existing literature.

The primary goal of conducting a literature review is skimming through it.

A literature should have the accountability of the author based on their contribution in the academic research.

A literature should follow a pre-defined ~~procedure~~ procedure in a academic research.

7.a) ~~●~~ Ethics generally means set of ~~conduct~~ rules conducted on acceptable and unacceptable, determining right or wrong as such.

Ethics are important in determining its impact on people.

Ethics are not laws but the laws follow Ethics.

Ethics are a set of rules that help in determining whether it is right or not.

Ethics is important in the practice of engineering research as it includes

~~4~~ Fabrication: It includes collecting information or data that does not ~~exist~~ exist yet.

Falsification: It includes manipulating the already existing data.

Plagiarism: It includes copying of the entire research without contributing the authorship information.

7.b) 1] Authorship:

It includes defining the author information in the research.

2] Guest Authorship:

In a research, adding the author information even though his contribution is minimal or zero.

3] Ghost Authorship:

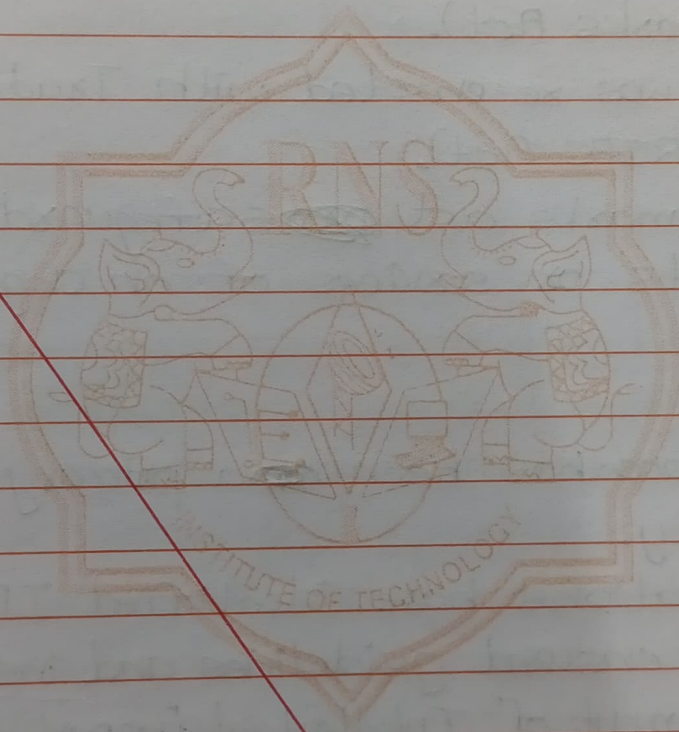
In a research, neglecting the author information even though he has given his contribution.

4] Order of listing of Authors:

In a research, there would be multiple author contribution. So listing the author with the most contribution and the next with the less contribution in a order.

§ Maintenance and Accountability:

In a research, maintaining the author information is mandatory. It is also important to have the accountability of the author based on their contribution in the research.



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