14/10/24
Q Nos.

CIE - Test 1

1) a. Research is a classic, well defined (re defined), organised Process of finding new knowledge or concept from the existing.

* Finding of new technologies or using of existing technologies to find new concepts, methods etc.

* Research is important because there wont be any Progress/ development in any field if research is not Performed

* It also improves one's understanding in a field to a deeper level

Objectives are as follows:

* Innovation: Finding new concepts, methods, technologies that helps in the development of any field you explore

* Problem solving: There are many areas where some Problems are unsolved

Q Nos.

* Collaboration:
while collaborating with people in the same field during research improves your knowledge objectives

* we can broadly classify ^ as Exploratory, Descriptive, Hypothesis testing

1.) b. the types of engineering Research are:

i) Descriptive Research:
* In this type of research we find the characteristic of the object we are stydying

ii) Analytical Research:
* we try to analyse the existing data and get some insights out of it. eg: relation b/w two variables

iii) Quantitative Research:
* we operate on numerical data and use statistical methods to get insights also we get to know about the data.

iv) Qualitative Research:
* we first try to stydy the observation. we use non-

Q Nos.

numerical data such as interviews, observations, surveys to study.

v.) Conceptual Research:

* In this research type we try to find new concepts or improve existing concepts

vi.) Empirical Research:

* In this research we make use of the observations to do activities like 'hypothesis testing'.

* Applied and fundamental Research are other type of research that is present.

4.) a. Descriptive Research:

* In this type of research we try to describe or find characteristics of the object we are studying

* In this research we don't ask the question why?

* May be Time taking sometimes as we need to go through good amount of literatures.

Q Nos.

Analytical Research:

* In this research we analyze data and try to find out the reason why, which we didn't in descriptive.

* we analyze the data, which can be done by tools available eg: Python, Power BI.

* Example is finding Relationship between two variables in a dataset. using analytical Research

* we can use any kind of data like text, audio, images, etc.

4)b) * web of science (WoS) is an popular bibliographic database along side with Google Scholar

* WoS also called as ISI or thomson Reuters.

* It allows you to search Scholarly literatures

* we can filter the search by just giving specific keyword

* In this way we can get the desired literature.

Q Nos.

* Researchers prefer to have access of multiple databases so that they can gain maximum benifit for the research they are working on.

* (Wos) is commonly used in research for reviewing scholarly literature, journals, articles, etc.

* We can also use google for basic searches. But the disadvantage is we are not sure where the data is coming from.

* By clicking on any journal, article, etc you can view the full text in (Wos).

5) a) i) Fabrication:

* Fabrication means the user uses his own created data for research.

* this happens only when the researcher is knowing about the desired output.

* It is a ~~harmfull~~ not good work in the Process of research and development.

Q Nos.

ii) Plagiarism:

* It is a type of mis conduct in which researcher copy and Pastes the work of other Person without giving credit to the desired.

* Plagiarism is one of the Popular research misconduct which can be avoided if Proper credit is given.

* On the increasing resources across the net, Plagiarism becomes a bigger threat.

5.)b.) Reading Mathematics and algorithm relates to research Process:-

* It can be related in advance research Projects.

* 'Role of Mathematical derivates' Play a crutial Role. As any good research Paper will have good amount of mathematics if required.

* Define a Problem to be solved.
* Find algorithms to solve it

Q Nos.

* Implement the algorithms with the help of Programming Languages (C, C++)

* Confident Vs Reality:
A Person can be confident about his algo/answer but the reality it can be different.

* Quick test:
To test again we can code and perform testing.

7.)a) * Ethics refers to a set of rules used to differentiate between conduct and misconduct or what is true and false.

* Ethics Plays an Crucial Role in engineering research practice.

* the main role of ethics is to revolve around us People

* Data available and analysis:
Since huge amount of data is available for use. they can be easily used which can sometimes be a research misconduct

Q Nos.

* Ethics gives one an idea of what to do and not to do.

* By following ethics in engineering Practices one can never do any misconduct activities.

7.)b.) * A Person who has worked in a Research should be given authorship.

* A Person who has not worked on any research, but his name is still there, also called 'guest authorship' is not allowed.

* The ordering of authors, Plays a crucial role as no one should be dissapointed.

* Publication authorship - while Publishing an journal or anything, everyone involved in the research should agree to Publish.

* Authorship criteria should be given to those who are actually deserving.

Q Nos.

10.)

a.) * Reading a data sheet

* A datasheet can contain different things for different branches like civil, mechanical electrical.

* Electrical students and civic students have different contents.

* the first sheet of the data sheet gives info about the data sheet

* like where are pins pinned. and other info.

* A Pin can be moved based on the requirements.

* Datasheets are skimmable. unlike reading mathematics and algorithms.

10.) b) * the primary goals of conducting a literature review are:

* Researcher needs to understand the documents which are already existing

* To know about the concepts and theories they need to know.

Q Nos.

* Avoiding Duplication:- once a literature review is done there is no possibility of duplicat

* Domain knowledge:
By doing literature research on any domain it improves your domain knowledge by getting to know about new things.

* Ex we can formulate an hypothesis after doing literature review.