



IQRA National University
Department of Electrical Engineering
Subject: Research Methodologies

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Terminal Examination Spring 2020

Student ID:.....

Question No: 1

- a) List down different steps involve in research process? (10)
- b) Explain different steps involve in formulating a research problem? (10)

Question No: 2

- a) A traditional research design is a blue print or detailed plan for how a research study is completed, list steps involved in planning a research study? (10)
- b) Differentiate between Qualitative and Quantitative Methods of research. (10)

Question No: 3

How study design is selected based on nature of investigation? (10)

(10)

©Good Luck☺

(1)

Q(1)

(a)

Different steps involved in
research process.

Scientific Research involves a systematic process that focuses on being objective and gathering a multiple of information for analysis so that the researcher can come to a conclusion.

The research process follows 8 steps.

1) Formulating a research problem

2) Conceptualizing the research design

(2)

3) Constructing an instrument for
Data collection.

4) selecting a Sample.

5) writing a research
proposal.

6) Collecting Data

7) Processing Data

8) writing a research
report.

(1) Formulating a research problem refers to state the problem in researchable manner. The researcher needs to refine the topic and clearly state what is intended to explore about the topic.

(2) In Conceptualizing your research is to define the problem that your research seeks to solve. In doing this, you shall need to contextualise and

position your research in terms of what is already known.

(3) In Constructing an instrument for data collection.

Data can be selected from the following two sources:

1) primary

→ observation

→ interview

→ Questionnaire

2) Secondary Source

→ Publications

→ Earlier research

→ Mass Media.

(4) Selecting a Sample.

The Sample includes everyone with all having an equal chance of being Selected. There is no bias whatsoever in this type of Sample. Every person in the population has an opportunity to be a part of the research.

(5) writing a research proposal

(6) Collecting Data

Data Collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion.

(7) Processing Data

It is a set of methods that are used to input, retrieve, verify, store, organize, analyse, or interpret a

(7)

Set of Data. Data processing enables information to be automatically extracted from data.

(8) Writing A research report.

gets aims is to write clearly and concisely about your research topic, so that the reader can easily understand the purpose and results, of your research.

Q.1
(b)

Different steps involved in
formulating a research problem.

- (1) Review the literature.
- (2) To decide what want you want to find out.
- (3) Identifying variables.
- (4) Constructing hypothesis.

1) Reviewing the literature.

A literature review is a comprehensive summary of previous research on a topic.

Literature review

→ Broadens your knowledge base in research area.

→ Bring clarity and focus.

Procedure for reviewing the literature.

- 1) Search for existing literature in your area of study.
- 2) Review the literature selected
- 3) Develop a theoretical framework
- 4) Develop a Conceptual framework.

(2) Decide what you want to find out about.

Source of Research problems

⇒ People, ⇒ problems

⇒ Programs, ⇒ phenomena

Steps in the formulation of a research problem.

1) Identify a broad field of interest to you

2) Dissect the broad area into sub areas

3) Select what is of most interest to you.

4) Raise research questions

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5) formulate objective

6) Asses your objectives

7) Go back and give
final Considerations.

~~3) Order~~

(3) Identifying variables

A variable in research simply refers to a person, place, thing or phenomenon that you are trying to measure in some way.

Types of variable

It can be classified into three no of ways

- 1) In terms of causal relationship
- 2) In terms of the design of the study
- 3) In terms of the unit of measurement.

(4) Constructing hypothesis.

A proposition that is stated in a testable form and that predicts a particular relationship between two or more variables.

If we think that a relationship exists, we first state it as a hypothesis and then test the hypothesis in field.

A hypothesis could be either

- Right
- partially right
- wrong

The function of hypothesis

- ⇒ It provides study with focus
- ⇒ Tells you what data to collect.
- ⇒ It enhances the objectivity in the study.

Characteristics of hypothesis.

- It should be simple, specific and clear.
- It should be capable of verification.
- It should be operationalisable.
- It should be related to the existing body of knowledge.

Q
(2)

(a)

A traditional research design is a blue print or a detailed plan for how a research study is to be completed. It includes.

1) Operationalizing variable so that they can be measured, operationalization is the process of strictly defining variables ~~at~~ into measurable factors. The process defines ~~the~~ fuzzy concepts and allows them to be, measured, empirically and quantitatively.

2) Selecting a sample of interest to study.

Probably Sampling means selecting the sample based on the theory of probability.

The sample includes everyone, with all having an equal chance of being selected.

there is no bias whatsoever in this type of sample.

Every person in the population has an opportunity to be a part of the research.

3) Collecting Data to be used
as a basis for testing
hypothesis.

Hypothesis testing is a method for testing a claim or hypothesis about a parameter in a population, using data measured in a sample.

There are four steps of hypothesis testing that were briefly introduced.

(1) state the hypothesis

(2) set the criteria for

(3) Compute the test statistic

(4) Make a decision.

(4) Analysing the results.

Analysing the results and finding is the most crucial part of any research.

It summarizes collected data. It involves the interpretation of data

gathered through the use of analytical

and logical reasoning

to determine patterns,

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relationships or trends.

Q (2)
(b) Difference between Qualitative and Quantitative methods of research.

Qualitative

⇒ It is method of inquiry that develops understanding on human & Social Science to find the way, people think and feel.

⇒ It is a research method or type that is exploratory

⇒ In qualitative type research data is verbal

⇒ In this type of research, elements of analysis are, in words, pictures, and object form.

Quantitative

⇒ Quantitative research is a research method that is used to generate numerical data and hard facts, by employing statistical, logical and mathematical techniques.

⇒ It is a research method or type that is conclusive.

⇒ In Quantitative type research data is measurable.

⇒ In this type of research, elements of analysis are in numerical form.

Qualitative

⇒ It is non structured technique like, In-depth interviews, group discussion, etc.

⇒ Its results Devolps initial understanding

⇒ Exampel is, marketing type research

⇒ It is less best

Quantitative

⇒ It is structured techniques such as Surveys, Questionnaires and observations.

⇒ Its results, recommend final course of concluding

⇒ Exampel, research carry out to know the sales of various toothpaste in a quarter by different Companies.

⇒ It is more best.

Qualitative

⇒ Its objective is to develop & discover ideas used in ongoing process

⇒ In this method Hypothesis is generated.

⇒ Seen as more Subjective less rigorous

Quantitative

⇒ Its object is to examine causes and effect relationship between variables.

⇒ In this method Hypothesis is tested.

⇒ Seen as rigorous more objective.

Q(3) Study Design based on the
nature of investigation.

Study Design is a process wherein the trial methodology and statistical analysis are organized to ensure that null hypothesis is either accepted or rejected and the conclusions arrived at reflect the truth.

A study design can be classified into 3 major categories.

- (1) study design based on the number of contacts with the study population
- (2) study design based on the reference period
- (3) study design based on the nature of investigation.

Study Design ~~are~~ based on the nature of investigation.

Now ~~the~~ it should be of three types.

(1) Experimental :-

→ If a relationship is studied by starting from the cause to establish the effects, it is called experimental study.

→ In this the independent variables can be observed, introduced, manipulated, or controlled by the

researcher or someone else.

(2) Non-experimental:-

→ If a study focuses on starting from the effects to trace the cause, it is called as a non-experimental study.

⇒ In this variables can not be introduced / ~~man~~ manipulated etc.

As the assumed cause has already occurred.

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Instead, the researcher retrospectively links the Cause to the outcome.

(3) Quasi or semi-experimental.

A mixture of traits of both experimental and non-experimental study design.

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