UGANDA INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
END OF YEAR ONE SEMESTER TWO EXAMINATIONS FOR AY 2025/2026
ICT AND ENGINEERING DEPARTMENT

PROGRAMME(S): DCS, DITB, DEEE, DECE

COURSE: **RESEARCH METHODS**

COURSE CODE : **BSM121**

DATE: **WEDNESDAY 24TH, JUNE 2026**

TIME: **9:00 AM – 12:00 NOON**

DURATION: **3 HOURS**

INSTRUCTIONS:

(i) This paper contains two Sections: A (40 marks) & B (60 marks).

(ii) Attempt ALL questions in Section A, and ONLY THREE questions in Section B.

(iii) All questions in Section B carry equal marks.

(iv) Credit will be given for use of relevant examples and illustrations.

(v) Begin each number in Section B on a new page of the answer sheet.

(vi) DO NOT write on this question paper.

SECTION A [40 MARKS]

Attempt **ALL** the Questions in this Section

SECTION A I [20 MARKS]

Write the correct alternative in the answer booklet provided **(1 mark @)**

1. Which of the following best defines research?
   A. A systematic and scientific process of collecting, analysing and interpreting data to answer a question or solve a problem
   B. The process of writing a report once a project has ended
   C. Any opinion gathered informally from a group of people
   D. A summary of textbooks written on a subject

2. Which of the following is NOT one of the general qualities expected of a good researcher?
   A. Objectivity B. Curiosity
   C. Bias toward a preferred outcome D. Patience

3. An in-depth examination of a single organisation, programme, or event in its real-life setting is best described as a:
   A. Survey B. Case study C. Census D. Pilot study

4. The first step in the research process is normally:
   A. Data collection B. Identification and definition of the research problem
   C. Writing the final report D. Selecting a sampling technique

5. A tentative, testable statement about the relationship between two or more variables is called a:
   A. Research objective B. Research hypothesis
   C. Conceptual framework D. Literature review

6. In a study on “the effect of mobile money usage on the sales of small businesses,” mobile money usage is the:
   A. Dependent variable B. Independent variable
   C. Moderating variable D. Extraneous variable

7. The main purpose of a literature review in a research study is to:
   A. Increase the page count of a proposal
   B. Identify gaps in knowledge and position the study within existing literature
   C. Replace the need for data collection
   D. List every publication ever written on the topic

8. A government report or institutional dataset used by a researcher who did not collect it personally is an example of:
   A. Primary data
   B. Tertiary data
   C. Secondary data
   D. Experimental data

9. Which research design is most appropriate for a study exploring a fairly new problem with little existing literature?
   A. Exploratory design
   B. Descriptive design
   C. Causal/experimental design
   D. Longitudinal design

10. A key feature that distinguishes qualitative research from quantitative research is that it:
   A. Relies primarily on numerical data and statistical tests
   B. Seeks an in-depth understanding of meaning, experience and context, often through non-numerical data
   C. Always uses larger sample sizes
   D. Cannot be combined with quantitative methods

11. Sampling is necessary in most research mainly because:
   A. It removes the need for a research design
   B. Studying an entire population is usually impractical, costly or time-consuming
   C. It always produces more accurate results than a census
   D. It eliminates the need for ethical approval

12. A technique in which every member of the population has a known, non-zero chance of being selected is called:
   A. Purposive sampling
   B. Convenience sampling
   C. Probability sampling
   D. Snowball sampling

13. A researcher who divides students into strata by faculty and then randomly selects students from each faculty in proportion to its size is using:
   A. Cluster sampling
   B. Stratified random sampling
   C. Convenience sampling
   D. Quota sampling

14. Yamane's formula, $n = N / (1 + N e^2)$, is commonly used to:
   A. Test the reliability of a questionnaire
   B. Determine an appropriate sample size from a known population, given a margin of error
   C. Calculate the mean of a data set
   D. Score a Likert-scale item

15. A questionnaire item that asks respondents to rate their agreement with a statement from "Strongly Disagree" to "Strongly Agree" uses a:

A. Likert scale B. Nominal scale C. Dichotomous scale D. Ratio scale

16. The extent to which a research instrument actually measures what it is intended to measure is called:
    A. Reliability B. Validity C. Objectivity D. Generalizability

17. The consistency or stability of results obtained from a research instrument over repeated administrations is called:
    A. Validity B. Reliability C. Triangulation D. Saturation

18. In a set of data, the value that occurs most frequently is called the:
    A. Mean B. Median C. Mode D. Standard deviation

19. Using someone else's ideas or words without proper acknowledgement, even when paraphrased, is best described as:
    A. Triangulation B. Plagiarism C. Coding D. Member checking

20. Obtaining a participant's voluntary agreement to take part in a study, after explaining its purpose, procedures and risks, is referred to as:
    A. Informed consent B. Data triangulation
    C. Peer debriefing D. Construct validity

SECTION A II [20 MARKS]

An electrical engineering institution intends to conduct a study to investigate the factors affecting the academic performance of Diploma students in Electrical and Electronics Engineering. The management has appointed a research team to carry out the study and provide recommendations for improvement.

Required:

a) Define the term research and explain any **two** characteristics of a good research study. **(4 marks)**
b) State and explain **four** objectives of research that may guide the study. **(4 marks)**
c) Research activities in Uganda face several challenges that affect the quality and quantity of research outputs.
    i) Explain any **three** research problems commonly faced by researchers in Uganda. **(3 marks)**
    ii) Suggest **three** possible solutions to overcome these research problems. **(3 marks)**
d) Outline **three** roles of research in national development and explain how each role contributes to improving society. **(3 marks)**

SECTION B [60 MARKS]

Attempt **ONLY THREE** Questions in this Section.

Question 1

Uganda Institute of Information and Communications Technology has observed a high failure rate among Electrical and Electronics Engineering students in practical laboratory courses. The administration intends to conduct a research study to establish the causes of poor performance and recommend appropriate interventions.

Required:

a) Explain any **three** characteristics of research that would ensure the study produces reliable and useful findings. **(6 marks)**
b) Describe any **five** qualities of a good researcher that would be necessary for conducting the study successfully. **(5 marks)**
c) Based on the scenario above, formulate:
   i) One research problem statement. **(5 marks)**
   ii) Two research objectives. **(2 marks)**
   iii) Two research questions. **(2 marks)**

Question 2

An electrical company intends to introduce solar-powered street lighting systems in a rural district. Before implementation, management wishes to conduct a study to determine the project's feasibility and community acceptance.

Required:

a) Distinguish between basic research and applied research using relevant examples. **(6 marks)**
b) Identify the most appropriate type of research for the above study and justify your choice. **(4 marks)**
c) Differentiate between qualitative and quantitative research methods. **(6 marks)**
d) Explain **two** advantages of using a mixed-methods approach in the study. **(4 marks)**

Question 3

An engineering student wants to investigate factors affecting the reliability of backup power systems in hospitals within Kampala.

Required:

a) Outline the major stages of the research process that the student should follow. **(10 marks)**
b) Explain how a literature review would assist the student in conducting the study. **(6 marks)**
c) State four sources of literature suitable for this research. **(4 marks)**

Question 4

a) Differentiate between the following types of research and give an example of engineering in each of the category **(10 marks)**
   i) applied and basic research
   ii) Qualitative and quantitative
b) Compare and contrast interviews and questionnaires as tools of data collection. Which one would you recommend for a study on power usage habits in rural Uganda and why? **(10 marks)**

Question 5

a) Differentiate between a population and a sample. **(4 marks)**
b) Explain the difference between probability and non-probability sampling techniques. **(4 marks)**
c) Describe four sampling techniques that may be used in educational research. **(8 marks)**
d) Explain two factors that influence sample size determination. **(4 marks)**

Question 6

A final-year Electrical and Electronics Engineering student is preparing a research proposal entitled:

"Assessment of Factors Affecting the Adoption of Solar Energy Systems in Urban Households."

During proposal review, the supervisor discovers that several sections were copied directly from internet sources without acknowledgment.

Required:

a) Explain **two** reasons why ethics is important in research. **(4 marks)**
b) Discuss **four** consequences of plagiarism in academic research. **(8 marks)**
c) Explain **three** methods that can be used to prevent plagiarism. **(6 marks)**

d) State **two** benefits of proper referencing in research reports. **(2 marks)**