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University Examinations 2024/2025

SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF MEDICAL LABORATORY SCIENCES

HMU 3218: RESEARCH METHODOLOGY

DATE: JANUARY 2025

TIME: 3 HOURS

INSTRUCTIONS:

Answer *All* questions

Ensure that all your answers are properly numbered

Part I multiple Choice Questions (MCQ): Write the correct answer on the space provided in the answer booklet. Each MCQ is one mark

Part II: Short Answer Questions – Answer questions following each other on the answer booklet

Part III: Long Answer Questions – Answer each question on the answer booklet

SECTION A: MULTIPLE CHOICE QUESTIONS (20 marks)

1. Which of the following best defines research methodology?
 - a) A theoretical framework for a research project
 - b) The tools used to collect and analyze data
 - c) A systematic way of solving a research problem
 - d) A statistical method

2. Which of these is an essential component of a research problem?
 - a) An extensive bibliography
 - b) Clear identification of the variables
 - c) A list of research tools
 - d) A pilot study
3. Hypothesis testing is primarily used to:
 - a) Review literature
 - b) Test the validity of a research theory
 - c) Collect data
 - d) Develop a new research problem
4. Which of the following defines a variable in research?
 - a) A factor that remains constant
 - b) A factor that can change or vary
 - c) An unmeasurable factor
 - d) A statistical output
5. A sampling frame refers to:
 - a) The method of selecting a sample
 - b) The total population being studied
 - c) A list of all individuals from which the sample is drawn
 - d) A summary of the study's findings
6. Ethical considerations in research include:
 - a) Selecting appropriate statistical tools
 - b) Protecting participant confidentiality
 - c) Writing an accurate literature review
 - d) Using correct research instruments

7. What is the main objective of descriptive research?
- a) To test hypotheses
 - b) To describe characteristics of a population or phenomenon
 - c) To manipulate variables for causal inference
 - d) To conduct experiments
8. Quantitative research typically involves:
- a) Non-numeric data analysis
 - b) Numeric data and statistical analysis
 - c) Case studies and interviews
 - d) Open-ended questions
9. Qualitative research is often used to:
- a) Test causal relationships
 - b) Understand underlying reasons and motivations
 - c) Generate statistical data
 - d) Analyze numerical data
10. In random sampling:
- a) Participants are selected based on availability
 - b) Every individual has an equal chance of being selected
 - c) A fixed number of participants is chosen
 - d) Specific characteristics are targeted
11. The main role of a pilot study is to:
- a) Finalize the research report
 - b) Test the feasibility of the research design
 - c) Analyze data
 - d) Generate new hypotheses

12. Which of the following best describes applied research?

- a) Research aimed at solving a specific problem
- b) Research that aims to generate new theories
- c) Research focused on expanding scientific knowledge
- d) Research focused on literature review

13. Measurement in research refers to:

- a) Collecting data
- b) Assigning numbers or labels to variables
- c) Testing hypotheses
- d) Analyzing qualitative data

14. Systematic sampling is best defined as:

- a) Random selection of participants
- b) Choosing every nth individual from a list
- c) Selecting a sample based on convenience
- d) Dividing the population into strata

15. Which of these is a primary data collection method?

- a) Literature review
- b) Observation
- c) Secondary analysis
- d) Archival research

16. The research design serves to:

- a) Identify the sample
- b) Provide a framework for the research process
- c) Define the population
- d) Test the research hypothesis

17. Qualitative data analysis typically involves:
- a) Statistical methods
 - b) Thematic or content analysis
 - c) Measurement of variables
 - d) Random sampling
18. The literature review is crucial for:
- a) Collecting primary data
 - b) Identifying gaps in existing knowledge
 - c) Developing a research tool
 - d) Testing the hypothesis
19. The term "sampling error" refers to:
- a) Bias in data analysis
 - b) Mistakes made during the research design
 - c) The difference between the sample results and the actual population
 - d) Errors in the literature review
20. In longitudinal research, data is collected:
- a) Once at a single point in time
 - b) Over an extended period
 - c) Only through surveys
 - d) Only from a small population

SECTION B: SHORT ANSWER ALL QUESTIONS (40 MARKS)

1. Differentiate between basic research and applied research. (5 marks)
2. What are the key features of qualitative research? Explain with examples. (5 marks)
3. Define sampling and describe two common sampling techniques. (5 marks)
4. What is the purpose of research design in a study? (5 marks)

5. Describe the concept of triangulation in qualitative research. . (5 marks)
6. Explain the importance of ethical guidelines in research involving human subjects. . (5 marks)
7. What are the main components of a research proposal? . (5 marks)
8. Define data analysis and explain its role in research. . (5 marks)

SECTION C: LONG ANSWER TWO QUESTIONS (40 MARKS)

1. Discuss the importance of a pilot study in the research process, with examples of how it can influence research outcomes. .(20 marks)
2. Describe the data collection process in both quantitative and qualitative research methods, and discuss the strengths and limitations of each. . (20 marks)
3. Explain the key principles and practices of ethical research involving human participants, and provide examples of how these principles are applied. (20 marks)