



MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

UNIVERSITY POSTGRADUATE EXAMINATION

2018/2019 ACADEMIC YEAR

**FIRST YEAR FIRST SEMESTER EXAMINATION FOR PHD IN
INFORMATION TECHNOLOGY**

SCS 703– ADVANCED RESEARCH METHODS IN COMPUTING

DURATION: 3 HOURS

DATE: 7/5/2019

TIME: 2- 5 P.M.

Instructions to candidates:

1. Answer **Any Four** questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

QUESTION ONE (25 MARKS)

Study the attached paper “A constructive heuristic for the two-dimensional bin packing based on value correction” and answer the following questions.

- a) Explain the problem being studied. (5 marks)
- b) Who is the most cited author and how relevant is his/her work to the current paper? (10 marks)
- c) Identify a gap from the paper and then write a problem statement of your own proposed research. (10 marks)

QUESTION TWO (25 MARKS)

Most studies in computing are either quantitative in nature or contains some aspects of qualitative and quantitative strategies. In a few cases, however, one can design a purely qualitative study.

- a) Distinguish between qualitative and quantitative studies, stating when you would opt for each. (8 marks)
- b) Give an example of a qualitative-oriented problem statement, and then explain how you would collect and analyze the data that will solve this problem. (12 marks)
- c) What are the possible limitations of your study in (b) above? (5 marks)

QUESTION THREE (25 MARKS)

- a) Explain how you would design a simulation experiment to validate “an effective network routing algorithm” that you recently developed. (15 marks)
- b) Explain any types of validity threats that could affect the findings of this simulation experiment negatively. (10 marks)

QUESTION FOUR (25 MARKS)

Study the following research purpose presented at a seminar by an information technology research student and then answer the questions that follow.

“To determine the factors affecting citizen readiness for e-government systems and then develop a citizen readiness evaluation framework”

- a) Write a problem statement related to this topic. (6 marks)
- b) Write at least three objectives that you think could be suitable for the study. (6 marks)
- c) Describe an expert opinion survey study that you would employ to prove that the framework can actually be used to evaluate citizen e-readiness as proposed by the research purpose. (10 marks)
- d) State the given research purpose as a topic such that it portrays some more specific information on its scope. (3 marks)

QUESTION FIVE (25 MARKS)

- a) Describe the various correlation statistics and then explain when you would opt for each. Give at least one sample scenario, then recommend one of the statistics for it. (10 marks)
- b) The following excerpt was extracted from a recent grant advert from a local donor. Study its requirements and then use them to develop a sample PhD research proposal budget. Assume that a PhD takes 3 calendar years and attracts a maximum of 2 million Kenya shillings. (15 marks)

ITEMIZED BUDGET

The budget item lines must be in line with your research methodology.

Equipment: Ordinary equipment normally found in most labs are not supported by this grant e.g. laptops, PCs, printers, phones and cameras

Local travel: Should not be more than 20% of the total budget.