MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

UNIVERSITY POSTGRADUATE EXAMINATION

ACADEMIC YEAR

FIRST YEAR FIRST SEMESTER EXAMINATION FOR MASTER OF SCIENCE IN INFORMATION TECHNOLOGY

SCS602 – RESEARCH METHODS IN COMPUTING

DURATION: 3 HOURS

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)

a) Discuss any four key issues for conducting a survey by questionnaire. **(4 Mks)**

b) Giving relevant examples differentiate classification of research along the perspectives of field, approach and nature **(9 Mks)**

c) Describe six elements of an experiment. Explain why each is important. **(12 Mks)**

QUESTION TWO (25 MARKS)

Describe the relevance of the following statistical measures often used by researchers and give an example of where each measure can be used in computer science research.

a) Coefficient of variation **(5 Mks)**

b) Arithmetic average **(5Mks)**

c) Coefficient of skweness **(5 Mks)**

d) Regression equation of X on Y **(5 Mks)**

e) Coefficient of $\Upsilon yx_2.x_1$ **(5 Mks)**

QUESTION THREE (25 MARKS)

a) Briefly describe the important parametric tests used in the context of testing hypotheses. Explain also how such tests differ from non- parametric tests. **(7 Mks)**

b) Distinguish between the following:

    i. Simple hypothesis and composite hypothesis

    ii. Null hypothesis and alternative hypothesis

    iii. One tailed test and two tailed test.

    iv. Type I error and type II error **(10 Mks)**

    Acceptance region and Rejection region

c) The following nine observations were drawn from a normal population:

27,19,20,24,23,29,21, 17, 17

    i. Test the null hypothesis Ho: $\mu = 26$ against the alternative hypothesis H_1: $\mu \neq 26$

    At what level of significance can H_0 be rejected?

    ii. At what level of significance can Ho: $\mu < 26$ be rejected when tested against H_1: $\mu < 26$?

(8Mks)

QUESTION FOUR (25 MARKS)

a) Explain why a researcher may be interested to know what data is available during problem statement. **(4 Mks)**

b) Describe the components of a research problem and explain why the task of defining a research problem often follows a sequential pattern **(7 Mks)**

c) Explain the meaning and significance of a research design. **(6 Mks)**

d) Research design in exploratory studies must be flexible but in descriptive studies, it must minimise bias and maximise reliability. Discuss this statement and give an example of exploratory research and descriptive research **(8 Mks)**

QUESTION FIVE (25 MARKS)

a) Describe why literature review is important when preparing a proposal. Give two hypothetical examples of an entry in the list of references for IEEE referencing style. **(5Mks)**

b) Discuss the characteristics of research objectives. Explain problems that may arise as a result of having too many objectives. **(8 Mks)**

c) Explain eight major sections of a research report and describe the content of each srection. Give examples where appropriate**.** (**12 Mks)**