MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

UNIVERSITY ORDINARY EXAMINATION

2018/2019 ACADEMIC YEAR

FIRST YEAR **SECOND** SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE SOFTWARE ENGINEERING

SCS 103– FUNDAMENTALS OF SOFTWARE ENGINEERING

DURATION: 2 HOURS

DATE: 26/3/2019

TIME: 9-11 A.M.

Instructions to candidates:

1. Answer question One and Any Other Two questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

a) Explain three most important characteristics of requirement specification and explain why each of them is so important. (6 marks)
b) Describe system testing and briefly explain the three types of system testing. (5 marks)
c) Reliability and usability are important software quality attributes. Give a brief explanation of both attributes. (4 marks)
d) Briefly explain the objectives of software design. (5 marks)
e) Enlist any four principles of agile methods. (4 marks)
f) Explain the following as used in software engineering:
   i. Software quality assurance (2 marks)
   ii. Non-functional requirements (2 marks)
   iii. Software reverse engineering (2 marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

a) A small specialist language training company would like to improve the services offered to the existing clients and increase its client base by replacing the existing call center and paper-based mailshots with outline web technology deployment. As a consultant requirements engineer, discuss two tools and techniques that you would deploy to elicit, analyze, document and check services requested by the company and any actual or implied constraints. (10 marks)
b) Explain five difficulties that may be encountered in the process of requirements elicitation and analysis. (10 marks)

QUESTION THREE (20 MARKS)

a) Explain any four benefits that an incremental software development process model might have compared to the waterfall model. (8 marks)
b) Coupling and cohesion are two important concepts in software engineering. Define these two concepts and explain the problems that arise if two modules have high coupling. (8 marks)
c) Explain the following object oriented concepts used in software engineering:
   i. Encapsulation (2 marks)
   ii. Polymorphism (2 marks)

QUESTION FOUR (20 MARKS)

a) Describe any four types of risks that might be identified in a software project checklist. (8 marks)

b) The four categories of software maintenance are: perfective, adaptive, corrective and preventive.

   i. Explain the meaning of each category. (4 marks)

   ii. How would you classify the following maintenance activities? (4 marks)

      I. Hardware and software platform change

      II. Correcting errors found by users

      III. Producing a design document (as the original document has been lost), and,

      IV. Modifying some parts of software due to changing user requirements.

c) Explain the following design strategies:

   i. Functional design (2 marks)

   ii. Object oriented design (2 marks)