TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR:

MASTERS OF SCIENCE IN MECHATRONICS

ETM 5104: PROGRAMMING ABSTRACTION

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: SEPTEMBER 2018

TIME: 2 HOURS

DATE: Sep 2018

<u>**Instructions to Candidates**</u>
You should have the following for this examination
-Answer Booklet, examination pass and student ID
This paper consists of **FIVE** questions. Attemptquestion ONE (Compulsory) and any other TWO questions.
Do not write on the question paper.

Question ONE

a) Describe any FOUR fundamental features of object-oriented programming. (6marks)

b) The term modularity in programming is a fundamental term. Clearly describe what it means (3 marks)

c) Critically discuss software development using object-oriented programming, giving the advantages and disadvantages. (6 marks)

d) Software Requirements Elicitation is an important task in any software development process. Explain its importance and give any three possible methods used. (5 marks)

e) Discus the perception of a programmer when they decide to skip the design stage. (4 marks)

f) Outline the FOUR stages of system design.   (2marks)

g) A sequence diagram represent the functionality of the systemfrom user's point of view. Draw a suitable sequence diagram for an interaction between a lecturer and assistant lecturer as actors and the students.   (4 marks)

Question TWO

It is widely believed that systems development methodologies (SDMs) can help improve the software development process. Nevertheless, their deployment often encounters resistance from systems developers. Agile methodologies, the latest batch of SDMs that are most suitable in dealing with volatile business requirements, are likely to face the same challenge as they require developers to drastically change their work habits and acquire new skills.

i) Why are SDMs not accepted?   (3 marks)
ii) Describe the factors that cause agile methodologies to be accepted.   (12 marks)

Question THREE

Blind computer science students face significant challenges in modern curricula. Computer programming has seen extensive growth of visual tools and environments. Most end-user development is for visual environments, from graphical user interfaces (GUIs) to web pages. The tools of choice have become highly visual integrated development environments (IDE). Visual modeling languages such as Unified Modeling Language (UML) are a major element of program understanding and design. All of these tools and methods are problematic for a blind student.

Discuss the challenges faced by both the instructor and student as they adapt tools, material, and assignments in an object-oriented programming course.   (15 Marks)

Question FOUR

The properties needed for UML to SUPPORT EXTREME MODELING are: 1. UML needs to be fully expressive, 2. UML needs to be a more compact notation than an ordinary programming language, 3. UML needs an effective translation into efficient code, 4. UML needs support for testing, 5. UML needs a simple and usable module concept, 6. The tool support must be adequate.

Critically discus these properties which are already satisfied by UML or how to reshape UML to make it usable for the Extreme Programming approach.   (15 marks)