MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SPECIAL / SUPPLEMENTARY EXAMINATIONS FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 208: OBJECT ORIENTED ANALYSIS AND DESIGN

DATE: 30/8/2022   **TIME: 2.00-4.00 PM**

INSTRUCTIONS:

This paper consists of FIVE questions
*Answer **question one** and other **two questions** in this paper*

QUESTION ONE (THIRTY MARKS)

a)   Explain the following terms as used in object-oriented   analysis and design

     i.   Object model   (1 mark)

     ii.   Encapsulation   (1 mark)

     iii.   Polymorphism   (1 mark)

     iv.   Abstraction   (1 mark)

     v.   Inheritance   (1 mark)

b)   Discuss the importance of modeling before real development   (3 marks)

c)   Define objects and classes and their importance in design and analysis of a system (4 marks)

d)   Differentiate between a use case and a scenario. Give a specific example of a use case with a
     few possible scenarios   (4 marks)

e)   State five primary tasks in object oriented analysis   (5 marks)

f)   Describe the functional differences between the following types of UML diagrams:

     i.   Class diagram   (2 marks)

     ii.   Object diagram   (2 marks)

     iii.   Sequence diagram   (2 marks)

     iv.   Use case diagram   (2 marks)

g)   Outline challenges faced in requirements capture.   (2 marks)

QUESTION TWO (TWENTY MARKS)

a) Explain five attributes of a complex system (10 marks)

b) Describe and outline the steps of the below analysis techniques used for Object oriented analysis

    i.   Object Modeling (3 marks)

    ii.   Dynamic Modeling (3 marks)

    iii.   Functional Modeling (3 marks)

c) List two programming language that can be used after object-oriented analysis and design.

(1 mark)

QUESTION THREE (20 MARKS)

a) Using proper symbols outline the four uml relationships (8 marks)

b) Explain the following relationships among objects giving an example to each.

    i.   Hierarchical inheritance (3 marks)

    ii.   Multilevel inheritance (3 marks)

c) Objects can be related in other ways than by inheritance and aggregation. Any relationship between real world object can be modeled. Illustrate with examples the relationships that exist (6 marks)

QUESTION FOUR (20 MARKS)

a) Assume that you have been consulted to come up with a library system for cataloging books. The catalogue will be used to assist students retrieve books from the shelves in a fast and efficient way. The catalogue stores the name of the book, the author and the date of publication and the shelf where the book is located in terms of the door and categorization. If the catalogue is not there, the librarian does it manually.

    i.   Develop a class diagram from the scenario (8 marks)

    ii.   Develop an activity diagram from the above scenario (6 marks)

b) Explain six software, crisis that object oriented analysis and design try to solve (6 marks)

QUESTION FIVE (20 MARKS)

a) Testing is a continuous activity during software development. In object-oriented systems, testing encompasses three levels, namely, unit testing, integration testing, and system testing. Discuss each step involved.

(9 marks)

b) Outline the categories of system testing. (3 marks)

c) Mention and explain the quality factors of software quality assurance. (8 marks)