



MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR SECOND SEMESTER EXAMINATION FOR
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SIT 309: OBJECT ORIENTED DESIGN

DATE: 18/4/2019

TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer **question ONE** and any other **TWO** questions.

QUESTION ONE (30 MARKS)

- a) Specify when each of the two different accessibilities (public, private, protected) should be used (6 marks)
- b) Explain the meaning of polymorphism. (2 marks)
- c) Explain what a design pattern means. (2 marks)
- d) Outline any FOUR characteristics of object oriented systems (8 marks)
- e) Read through the following case and draw a use case diagram.
In placement management system, placement officer does the following
 - i. Identifies vacancy for placement
 - ii. Identifies an intern
 - iii. Assigns intern to a vacancy (6 marks)
- f) A state machine is graphically represented through a state transition diagram. Name and explain the four parts of a state (4 marks)
- g) Define encapsulation (2 marks)

QUESTION TWO (20 MARKS)

- a) Briefly explain what is meant by object oriented approach to systems development. (6 marks)
- b) Differentiate between object oriented analysis and object oriented design (6 marks)
- c) Describe any three functions of a sequence diagram (6 marks)
- d) Name four examples of object oriented programming languages (2 marks)

QUESTION THREE (20 MARKS)

- a) Briefly explain the following components of a class diagram.
 - i. Class name
 - ii. Association
 - iii. Inheritance
 - iv. Attributes (8 marks)
- b) Explain three diagrams used during system design for object oriented systems. (6 marks)
- c) Differentiate between object and class diagrams. (2 marks)
- d) Read the following narration and draw an object diagram.
 - i. A bank has many branches. In each zone, one branch is designated as the zonal head office that supervises the other branches in that zone.
 - ii. Branch can have multiple accounts and loans. An account may be either a savings account or a current account.
 - iii. A customer may open both a savings account and a current account.
 - iv. However, a customer must not have more than one savings account or current account. A customer may also procure loans from the bank. (4 marks)

QUESTION FOUR (20 MARKS)

- a) Name and explain the four main concepts of the dynamic modeling in object oriented analysis and design. (8 marks)
- b) Describe the four features of message passing in object oriented and design (8 marks)

- c) With an aid of a diagram, describe the meaning of the two terms (generalization and specialization) used in inheritance. (4 marks)

QUESTION FIVE (20 MARKS)

- a) Suppose a person is taking a taxi from place X to place Y. Draw a state transition diagram depicting the states from X to Y. (6 marks)
- b) Define the following terms as used in object oriented design.
- i. Event (2 marks)
 - ii. Transition (2 marks)
 - iii. Activity (2 marks)
 - iv. Scenario (2 marks)
- c) Name and explain three advantages of using polymorphism. (6 marks)