

MACHAKOS UNIVERSITY
UNIVERSITY EXAMINATIONS 2017 / 2018
YEAR 3 SEMESTER x EXAMINATION FOR THE DEGREE OF BACHELOR
OF SCIENCE IN COMPUTER SCIENCE
SCO 310: COMPONENT PROGRAMMING

{Supplementary Exam}

SECTION A: COMPULSORY QUESTION (30 MARKS)

QUESTION 1

- a. Define the following terms as used in component –based software engineering.
 - i. Software component. (2Marks)
 - ii. Component architecture (2Marks)
- b. List and explain the essential characteristics of a component as used in component-based software development. (8Marks)
- c. Specify the **THREE** non-technical aspects that are needed in component interfaces. (3Marks)
- d. Differentiate between Object Oriented Programming and Component-based programming paradigms. (4Marks)
- e. Component programming could use almost any language however minimal requirements exist and govern the choice of tools and languages for component programming.
 - i. Explain **TWO** requirements that component programming languages must meet. (2Marks)
 - ii. Give and briefly elaborate any **TWO** languages suitable for component programming. (4Marks)
- f. List the advantages associated with the use component based software development. (2Marks)
- g. State and explain the COM facilities and services. (3Marks)

SECTION B: ANSWER ANY TWO QUESTIONS (20 MARKS EACH)

QUESTION 2

- a. Operating system is among the early component systems. Briefly explain **THREE** reasons why early component systems they insufficiently enable wide spread software reuse. (6Marks)

- b. CBSE processes are software processes that support component-based software engineering that take into account the possibilities of reuse. With reference to show the difference between the following types of CBSE processes. (4Marks)
 - i. Development for reuse
 - ii. Development with reuse
- c. Distinguish between Component Architecture and Component Framework in reference to component programming. Give two examples for each case. (6Marks)
- d. Specify the fundamental properties of component technology. (4Marks)

QUESTION 3

- a. In most software development projects there is some software reuse. This reuse typically informally. Such informal reuse takes place irrespective of the development process used. The first published model of software development process was developed from more-general system engineering processes. This model is known by a number of names, including the “waterfall model”. Since then, a number of software development process models has been developed and employed. One such model is “**component-based software development**”. It is claimed that there are some similarities between the waterfall and component-based software development models; there are also some significant differences.
 - i. Identify and elaborate on those areas of difference between the two-identified models (8Marks)
 - ii. List any **TWO** advantages associated with the use component based software development (2Marks)
- b. Define *Java Bean* and give any **FOUR** advantages of *Java Bean*. (6Marks)
- c. What is the use of COM apartments and MTS? (4Marks)

QUESTION 4

- a. List and explain four key principles of component based software development. (8Marks)
- b. Explain why we need CORBA and give the **THREE** essential parts of CORBA. (5Marks)
- c. Briefly explain how a JAVA ORB application is developed (3Marks)
- d. What is the difference between components and connectors? (4Marks)

QUESTION 5

- a. Using illustrations explain the **THREE** types of component composition. (6Marks)
- b. Specify the roles of component architecture. (4Marks)
- c. What is blackbox component framework and why do we need blackbox? (4Marks)

- d. Discuss the issues in CORBA and DCOM interoperability. State the need for interoperability and explain how it is realized. (6Marks)

End of Exam