



MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR SCIENCE (COMPUTER SCIENCE)

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SCO 310/SIT 300: COMPONENT PROGRAMMING

DATE: 17/8/2021

TIME: 8:30 – 10:30 AM

INSTRUCTIONS:

Answer Question One (Compulsory) and ANY other two questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Explain the significance each of the following abbreviations as applies to component-oriented programming: (8 marks)
 - (i) DBSL
 - (ii) CCM
 - (iii) MDA
 - (iv) EJB
- b) Explain the implications that arises from Szyperski's definition of components as applies to component-based software engineering. (4 marks)
- c) Explain the difference between *device beans* and *Java beans*. (4 marks)
- d) Create a JavaBean component that displays the current time and date. (6 marks)
- e) Explain the role played by *the Common Language Runtime (CLR)* and *the Framework Class Libraries (FCL)* in .NET Framework. (2 marks)
- f) Describe three capabilities that are provided by the CORBA Interoperable Naming Service that are not available with the RMI naming service. (6 marks)

QUESTION TWO (20 MARKS)

- a) While referring to a specific application example, give the significance of *component model* in component-oriented programming. (4 marks)
- b) Compare and contrast the *Object-Oriented Programming* and *Component Oriented Programming*. (8 marks)

- c) “A component-level design can be represented by using some intermediary representation that can be translated into source code” With an aid of a diagram, explain in support of this statement. (8 marks)

QUESTION THREE (20 MARKS)

- a) Justifying your answer, state whether each of the following statements are TRUE or FALSE. (8 marks)
- (i) In JavaBeans, mappings from role names to specific roles in the deployment environment are declared separately using a deployment tool.
 - (ii) CORBA and Java usually coexist in almost all server application products.
- b) You are required to develop a simple component-based system using JavaBeans. The system integrates components that can perform basic arithmetic tasks like computing the simple or compound interests for business entities. Provide the programming components, codes and interface that can be used to help in achieving this task. (12 marks)

QUESTION FOUR (20 MARKS)

- a) Describe three ways in which the notification provided by the CORBA Event Service differs from that provided by the **Java Observable** class. (6 marks)
- b) Design a Java CORBA component that converts temperature from Celsius and Fahrenheit. (8 marks)
- c) Using suitable examples, distinguish between *CORBA services* and *CORBA facilities* as applies in component-based programming. (6 marks)

QUESTION FIVE (20 MARKS)

- a) Differentiate between *OSGi components* and *OSGi services*. (2 marks)
- b) You are required to design a .NET component in .NET C#, managed C#, .NET VB that provides services of a calculator. The calculator should have the functionalities to perform addition, subtraction, multiplication, and division of two real numbers. It should be able to detect the zero divisor in division operation. Include the necessary GUI and codes in your design. (8 marks)
- c) Using a suitable example, explain three major roles within the Web Service Architecture. (6 marks)
- d) Write a ASP.NET code that can be used capture numerical values for arithmetic computation in a web service application. (4 marks)