



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2009/2010

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (SOFTWARE ENGINEERING)

SSE 402: COMPONENT BASED SOFTWARE DEVELOPMENT

DATE: Thursday, 15th April, 2010

TIME: 11.00 a.m. – 1.00 p.m.

INSTRUCTIONS:

Answer **THREE** questions. Question **ONE** is Compulsory. Each question carries equal marks.

- Q.1
- a) Define a software component (2 marks)
 - b) Identify the key purpose of software components (2 marks)
 - c) Using an UML illustration briefly discuss the parts that make up a software component. (4 marks)
 - d) With the aid of a diagram describe what is an Object Request Broker? (4 marks)
 - e) Identify and comment on the three key properties that distinguish a component from other software. (4 marks)
 - f) Define the different type of middleware and state one example of their use (4 marks)
- Q.2
- a) Define black box components and the key benefits or disadvantages of each. (2 marks)
 - b) With the aid of an example discuss software component Interfaces and how they help improve software development (4 marks)

- c) What is “glue code” in the CBSD context and how is it different from a wrapper? Explain by giving pseudo-code example(s) in a business environment. (6 marks)
- d) An online match ticket system is required for the 2010 world cup. Users can purchase tickets based on a match schedule using mpesa or credit card and can then print an eTicket. The price of a ticket depends on the type of seat. Tickets are not refundable once sold. Show the components required would interact to print a ticket which shows the fans name, match, the price, and stadium, type of seat and date and time.
- i) Show the key objects, actors and user cases. (2 marks)
- ii) Illustrate UML components for the above system including the interface required for the ticket. (6 marks)
- Q.3 a) Discuss the various types of component frameworks and give examples of each. (4 marks)
- b) With relevant examples state the key advantages and disadvantages of a component framework (4 marks)
- c) Discuss patterns and how they are useful in the component software development (4 marks)
- d) With the aid of an illustration describe each of the five tiers in a component architecture used to deliver component services. (8 marks)
- Q.4 a) What is a component model (2 marks)
- b) Describe the component model runtime environment (3 marks)
- c) Describe any one of the listed component models, stating their origin, supported technology environment, how they are stored and retrieved and the strengths and weaknesses of the model. (7 marks)
- i) Net (DCOM/COM)
- ii) Java Beans/Java Enterprise Beans
- iii) COBRA/CMM.

- d) You have recently joined a manufacturing organization that is in the process of selecting a new manufacturing ERP application to replace aging and obsolete system purchased 15 years ago. The company has extensively modified the old system to support its interface to third part subsystem that control the plant operations and equipment. It has been difficult to find a replacement in the market. Write an executive summary highlighting the key points you would use to support the purchase of an ERP that is component based. (8 marks)
- Q.5 a) Explain the purpose of middleware and why is it different from regular software components (4 marks)
- b) Discuss the non functional design component realization strategies that need to be considered after performing a gap analysis of the user requirements. (6 marks)
- c) With the aid of an illustration discuss each of the stages of the Component Software Development Life Cycle and the key risk in each stage. (10 marks)