TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY IN INFORMATION AND COMMUNICATION TECHNOLOGY

EIT 4403 : SOFTWARE COMPONENT PROGRAMMING

SERIES: SEPTEMBER 2018

TIME: 2 HOURS

DATE: Sep 2018

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

(a.) What were the three different classes/interfaces required to be extended/implemented in the EJB 2.x specification on implementation of a basic component?

(3 marks)

(b.) State the main objectives of component-oriented software development.

(2 marks)

(c.) What are the middleware requirements that are common in most EJB 2.x specifications?

(4 marks)

(d.) Why are products like a kitchen cabinet are said to be assembled while software products are said to be integrated?

(2 marks)

(e.) Give six characteristics that define a component in general.

(6 marks)

(f.) Distinguish between provided interfaces and required interfaces.

(4 marks)

(g.) In a Java SE platform, how can packages and JARs be used as components?

(3 marks)

(h.) Which callback methods had to be implemented as part of the EJB2.x specification?

(3 marks)

(i.) How is the Spring MVC model configured in a Web application?

(3 marks)

Question TWO

(a.) Distinguish between the two types of a Spring container.

(4 marks)

(b.) What feature makes the Spring framework unique?

(2 marks)

(c.) Spring beans are only categorized into two only at the time of instantiation, which are these two categories and how are they different?

(4 marks)

(d.) What does the OSGi service registry entail?

(2 marks)

(e.) Briefly explain the two attributes of a service in SCA model.

(4 marks)

(f.) How dependency injection provided for EJB component?

(2 marks)

Question THREE

(a.) In each of class design principle that is prescribed in the acronym SOLID, briefly explain what it is and why it is required.

(10 marks)

(b.) Which principle does “Glue” code that is used to remove runtime dependency on components use?

(2 marks)

(c.) What does the component compatibility characteristic prescribe for a component?

(2 marks)

(d.) How does the Spring container manage relationship across multiple components that are deployed in it?

(2 marks)

(e.) Briefly distinguish between the two types of Spring container.

(4 marks)

Question FOUR

(a.) Describe the four types of components that are evident in an N-tier architecture.

(8 marks)

(b.) What constitutes an EJB component in the current EJB 3.x specifications?

(4 marks)

(c.) Define the term OSGi bundle and give the elements that are considered to be part to it.

(4 marks)

(d.) (i.) What does the acronym OSGi stand for?

(ii.) What are the conceptual layers that are evident in the OSGi framework?

(4 marks)

Question FIVE

(a.) Of what importance is the decoupling of application classes have, to component composition in the POJO programming model?

(4 marks)

(b.) (i.) Define the term container and give the expected services provided by one regardless of the platform.

(ii.) Give three containers with their corresponding functionality used in a typical Java EE platform.

(iii.) Distinguish between a lightweight container and a heavyweight container.

(10 marks)

(c.) Differentiate between the two forms of implementing the Inversion of Control design pattern.

(4 marks)

(d.) What is the consequence of the basic principle of dependency injection?

(2 marks)