



UNIVERSITY  
of  
TECHNOLOGY,  
MAURITIUS

## **MSc. Software Engineering**

**Cohorts: MSE/09/PT & MSE/08/PT**

**Examinations for 2009 – 2010 / Semester 1**

**Resit Examinations for 2008 – 2009 / Semester 1**

**MODULE: Service Oriented Architecture**

**MODULE CODE: WAT 5101**

**Duration: 2 Hours**

### **Instructions to Candidates:**

1. Answer **all** questions.
2. Questions may be answered in any order but your answers must show the question number clearly.
3. Always start a new question on a fresh page.
4. All questions carry equal marks.
5. Total marks 100

**This question paper contains 4 questions and 4 pages.**

## **QUESTION 1: (25 MARKS)**

a) Define the term 'software architecture'?

**(3 marks)**

b) A service is a software component of distinctive functional meaning that typically encapsulates a high-level business concept, and is usually made up of three parts. Describe the three sub-components that make up a service.

**(9 marks)**

c) How is a service repository linked to services?

**(5 marks)**

d) Describe the process of binding services at development time.

**(8 marks)**

## **QUESTION 2: (25 MARKS)**

a) Loose Coupling is one characteristic of SOA, and service description in the form of WSDL (Web Services Description Language), helps to achieve this. Explain how.

**(6 marks)**

b) Differentiate between the abstract and concrete description of a WSDL document.

**(4 marks)**

c) Describe the three main building blocks of a SOAP message.

**(9 marks)**

d) What do you understand by the term: 'SOAP HTTP binding'?

**(3 marks)**

e) What is the role of a SOAP engine, such as the Axis Apache SOAP engine?

**(3 marks)**

### **QUESTION 3: (25 MARKS)**

We identified three expansion stages that signify the different levels of maturity of an SOA in the enterprise: the fundamental SOA, the networked SOA and the process-enabled SOA.

- a) Imagine an airline web site that utilises four services - Flight Service, Customer Service, Booking Service, Payment Service - that encapsulates the major business entities and their behaviours that are relevant to the business processes that are exposed to their customers.

Describe, using the layering approach to SOA, how the above could be arranged in order to meet the requirements of the fundamental SOA. Clearly state any assumptions you made.

**(10 marks)**

- b) The third expansion stage is the fully leveraged SOA and is termed as the process-enabled SOA, which deals with process-centric services. What are possible reasons for introducing a process-centric service?

**(5 marks)**

- c) Imagine now having a new process "Booking process" which encapsulates the business process "Booking". Without using facades or any other type of intermediary layer, provide an enhanced diagram of your booking process in part. Clearly state any assumptions you made.

**(10 marks)**

#### **QUESTION 4: (25 MARKS)**

WS-Coordination specification provides a framework for managing complex service activities, by introducing a generic service, based on the coordinator service model. This coordinator composition consists of the following services: Activation service, Registration service, Protocol-specific services and a Coordinator.

- a) Describe the role of each service and the coordinator?

**(8 marks)**

- b) Each coordinator is based on a coordination type. Define coordination type.

**(4 marks)**

- c) Describe the activation and registration process of the coordination service composition.

**(13 marks)**

**\*\*\*END OF QUESTION PAPER\*\*\***