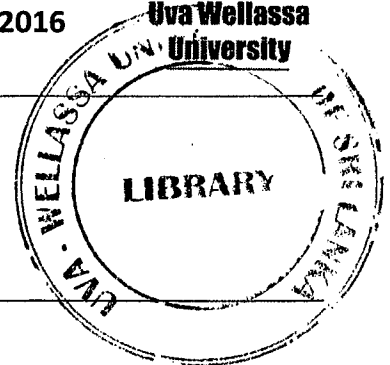


Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Computer Science and Technology
300 level 2nd Semester Examination – Jan. / Feb. 2016
CST 324-2 Middleware Architecture



Instructions to candidates

Duration: 02 hours

Number of questions: Four (04)

Answer all questions

Mark allocation: 100

1.
 - a. Centralized and distributed are two types of arrangements for the deployment of computing resources in organizations.
 - i. Briefly explain the terms centralized and distributed computing using diagrams.
 - ii. What are the characteristics of those two types?
 - iii. Give two (02) examples for each type.

(8 mark)
 - b. List three (03) key advantages of distributed computing against centralized computing.

(3 mark)
 - c. Scalability is one of the requirements of a distributed system.
 - i. Name three (03) other requirements of a distributed system.
 - ii. Briefly explain each requirement you have mentioned above.

(6 mark)
 - d. Describe any four (04) types of transparencies in distributed systems.

(8 mark)
2.
 - a. Define the term **middleware system** and briefly explain its characteristics.

(5 mark)
 - b. In the current context, middleware systems are essential for some situations. Explain any three (03) motivation factors of implementing a middleware system.

(6 mark)
 - c. Differentiate LPC (Local Procedure Call) and RPC (Remote Procedure Call).

(6 mark)
 - d. What are the four (04) main types of middleware available in the current context? Compare and contrast two (02) of those types.

(8 mark)
3.
 - a. Explain the process of an RPC system.

(4 mark)
 - b. Write short notes on the following terms considering an RPC system.
 - i. IDL
 - ii. Client stub and Server skeleton
 - iii. Parameter marshalling
 - iv. rpcgen

(8 mark)

c. "In RPC, generating the code is more complex than ordinary procedure calls". Discuss the statement. (3 mark)

d. You are required to implement a simple middleware system using RPC to satisfy the clients by providing the following services.

Service 1: Find the area of a rectangle

Service 2: Find the perimeter of a rectangle

- i. Write the complete IDL file called **rectCalculator.x** to create an RPC system for the above scenario.
- ii. What are the output files that will be generated by compiling the above IDL file using the following command?
`rpcgen -a -C rectCalculator.x`

(10 mark)

4.

a. Describe the RMI (Remote Method Invocation) architecture using a diagram. Name each component and describe their interaction sequence for a client request. (6 mark)

b. Explain the following two (02) statements those can be existed in an RMI server code.

```
Registry reg = LocateRegistry.createRegistry(5050);  
reg.rebind("CalcPrg", new CalcImpl());
```

(6 mark)

c. Compare and contrast RMI and CORBA. (6 mark)

d. "Web services are useful in Business-to-Business Transactions". Do you agree with this statement? Discuss your answer. (7 mark)