

Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Computer Science and Technology
300 level 2nd Semester Examination – Dec.-2017/Jan.-2018
CST324-2 Middleware Architecture



Instructions to candidates

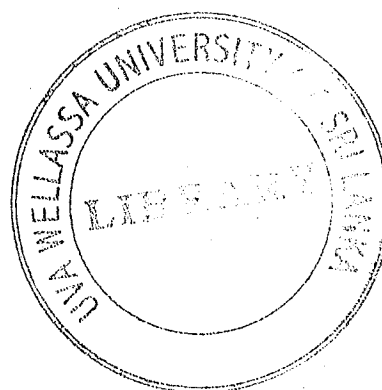
Duration: Two (02) hours

Number of questions: Four (04)

Mark allocation: 100

Answer all questions

1.
 - a. Centralized and distributed are two (02) types of arrangements in deploying computing resources in organizations.
 - i. Briefly describe the terms centralized and distributed computing. (4 mark)
 - ii. Differentiate the above mentioned arrangement types with three (03) characteristics. (6 mark)
 - b. Explain how resource sharing is helpful in distributed computing environment. (6 mark)
 - c. Explain the term 'Transparency' in distributed system environment. (3 mark)
 - d. Write short notes on the following types of transparencies.
 - i. Replication Transparency (3 mark)
 - ii. Concurrency Transparency (3 mark)
2.
 - a. What is meant by 'Middleware'? Explain three (03) challenges a system would face if middleware was not available? (6 mark)
 - b. State four (04) core middleware requirements. (4 mark)
 - c. Explain how component based architecture can be considered as a motivation factor to use middleware in distributed computing. (7 mark)
 - d. List and briefly describe any four (04) benefits of middleware. (8 mark)



- 3.
- Briefly explain how a Remote Procedure Call (RPC) is executed. (5 mark)
 - Explain the process of marshaling and unmarshaling in RPC environment. (4 mark)
 - Explain the usage of an Interface Definition Language (IDL) file in RPC environment and explain the main sections of that using a simple IDL file. (6 mark)
 - You are required to implement an area calculator as a simple middleware system using RPC to satisfy the clients by providing the following service.

Service: Find the area of a circle

- Write the complete IDL file called 'AreaCalculator.x' to serve the above task. (6 mark)
- What is the importance of 'rpcgen' in RPC implementation? (4 mark)

- 4.
- Describe the RMI (Remote Method Invocation) architecture with a diagram. Name each component and describe their interaction sequence for a client request. (7 mark)
 - Assume that you have to implement a currency converter using RMI in Java environment.
 - What is the name of the interface that you have to extend in your program? (2 mark)
 - Write the necessary code lines for the following requirements in the RMI server file of the calculator program.
 - Create a registry on port 5000.
 - Create a new service named 'MyConverter' and bind it to the registry. (4 mark)
 - Explain the meaning of the following statements in the RMI client file.
Registry reg = LocateRegistry.getRegistry(host, 5000);
Converter con = (Converter)registry.lookup("MyConverter"); (4 mark)
 - State two (02) functions of Object Request Broker (ORB). (2 mark)
 - What is Web Services Description Language (WSDL)? Discuss the architecture/process of WSDL with a suitable diagram. (6 mark)

