CONFIDENTIAL  STIJ3063

UNIVERSITI UTARA MALAYSIA

FINAL EXAMINATION
FIRST SEMESTER 2009/2010 SESSION

CODE/COURSE : STIJ3063 – DISTRIBUTED COMPUTING
DATE : 20th November 2009
TIME : 3.00pm – 5.30pm (2 ½ HOUR)
VENUE : DTSO, KYM

INSTRUCTIONS:

1. This book script contains TWENTY-ONE(21) questions in NINE (9) printed pages excluding the cover page.

2. Answer ALL the questions in the space provided.

MATRIC NO.: ____________________________ ( in words ) ____________________________ ( in figures )
IDENTITY CARD NO.: _________________ _________________
LECTURER: ___________________________
GROUP: _____ TABLE NO.: ____________

DO NOT OPEN THE PAGE UNTIL YOU ARE TOLD TO DO SO
Answer ALL questions in the provided area.

1. What is the role of middleware in a distributed system?
   
   (4 marks)

2. One important aspect of Distributed System is it consists of Autonomous components and probably heterogeneous. What is meant by autonomous and heterogeneous?
   
   (4 marks)

3. Explain what is meant by (distribution) transparency, and give THREE(3) examples of different types of transparency.
   
   (6 marks)
4. Explain what is meant by a virtual organization in the context of GRID.  

(6 marks)

5. Considering three-tiered client-server architecture, with the aide of diagrams, explain how search engine works in Internet.  

(5 marks)
6. In many layered protocols, each layer has its own header. Surely it would be more efficient to have a single header at the front of each message with all the control in it than all these separate headers. Why is this not done?

(5 marks)

7. Using the edge-server system diagrams below, explain how data are distributed and access by you if you are TM Streamix’s user from your house and how if you are using the Universiti Utara Malaysia Local Area Network that are connected to the Internet?

a. At your home using TM Streamix

(3 marks)

b. At Universiti Utara Malaysia using their Local Area Network

(3 marks)
8. Why are transport-level communication services often inappropriate for building distributed applications?

(5 marks)

9. A reliable multicast service allows a sender to reliably pass messages to a collection of receivers. Does such a service belong to a middleware layer, or should it be part of a lower-level layer?

(5 marks)
10. Are the following two URL can be considered as location independent?

    http://www.uum.edu/index.html
    http://www.uum.edu.my/index.html

          (5 marks)

11. If you are given the URL as http://ftp.unisba.edu.id/index.html, show how name resolution work using iterative name resolution and recursive name resolution?

          (10 marks)

     **Iterative Resolution**

     **Recursive Resolution**
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12. Name at least \textbf{THREE (3)} sources of delay that can be introduced between WWV broadcasting the time and the processors in a distributed system setting their internal clocks.

\textit{(3 marks)}

13. Give and briefly explain \textbf{TWO (2)} examples of distributed applications that can make use of GPS information

\textit{(4 marks)}
14. Explain in your own words what the main reason is for actually considering weak consistency models.

(4 marks)

15. Given the replicas as the following, what would need to be done to finalize the values in the conif such that both A and B see the same result?

(4 marks)

16. A file is replicated on 10 servers. List all the combinations of read quorum and write quorum that are permitted by the voting algorithm.

(4 marks)
17. List and briefly explain THREE (3) types of failure.  

(6 marks)

18. List and briefly explain the FOUR (4) security threats to be consider when developing a distributed system.  

(4 marks)

19. What is the difference between remote objects and distributed objects?  

(4 marks)
20. Why is it useful to define the interfaces of an object in an Interface Definition Language?

(3 marks)

21. Some implementations of distributed-object middleware systems are entirely based on dynamic method invocations. Even static invocations are compiled to dynamic ones. What is the benefit of this approach?

(3 marks)