**SULIT**

CODE/COURSE: TIJ3063 PENGKOMPUTERAN TERAGIH / DISTRIBUTED COMPUTING

DATE: 4 MEI 2009

TIME: 12:30PM – 3:00PM (2 ½ HOURS)

VENUE: TE

**ARAHAN:**
1. Buku soalan ini mengandungi LIMA BELAS (15) soalan dalam DUA BELAS (12) halaman bercetak tidak termasuk kulit hadapan.
2. Sila jawab SEMUA soalan di dalam ruang jawapan dan lembaran yang disediakan.

**INSTRUCTIONS:**
1. This book script contains FIFTEEN (15) questions in TWELVE (12) printed pages, excluding the cover page.
2. Answer ALL the questions in the space sheet 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**
1. Define a distributed computing system. Next, justify \textbf{TWO (2) concepts of transparency in the network shown in Figure 1 below.}

(5 marks)

\begin{figure}
\centering
\includegraphics[width=\textwidth]{distributed_computing_system.png}
\caption{Distributed Computing System}
\end{figure}
2. Explain **FOUR (4) reasons why developing Distributed Systems are essential, and list **FOUR (4) challenges in distributed system design.**

(12 marks)
3. Define “Communication Middleware”, and draw a diagram shows how the middleware hides the network services and other details of remote communication from clients and server applications.

(5 marks)
4. Sketch a diagram which illustrates the process within the Remote Procedure Call (RPC). Provide a brief explanation about the process.

(10 marks)
5. Describe (in general) the “message passing” metaphor, and draw a diagram illustrating the technique.

(8 marks)
6. Figure 2 illustrates the Berkeley Synchronization Algorithm. Explain this algorithm.

(6 marks)

Figure 2: Berkeley Synchronization Algorithm.

7. In Hypertext Transfer Protocol (HTTP) connection, there are two types of connection to fetch the documents, persistent and nonpersistent. Explain these two types.

(4 marks)
8. What is the web caching? Specify the client-side caching locations. (5 marks)

9. There are two ways in which server replication in the web generally takes place. Identify these two ways. (4 marks)
10. Transport layer security (TLS) protocol is the update of Security Socket Layer (SSL), which is an application-independent security protocol. Describe the two phases that is done to set up a secure channel, and draw a diagram to illustrate these phases.

(9 marks)
11. In Figure 3, the principle of providing and using the web services is shown.

![Diagram of web service principle](image)

*Figure 3: The principle of a web service.*

Define, and briefly illustrate the following: (6 marks)

- **WSDL:**

- **UDDI:**

- **SOAP:**
12. List the **FIVE (5)** types for the distributed file processing services.  

(5 marks)

13. Compare between Distributed-Database Server (DDS) and Network File System (NFS) according to the following:  

(4 marks)

<table>
<thead>
<tr>
<th>Comparison</th>
<th>DDS</th>
<th>NFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accessibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duplicated Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complexity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
14. Describe the ACID properties for distributed transactions. (8 marks)

15. Identify the following, according to chapter 9 "Distributed objects":

Objects

Object brokers

Object services (9 marks)
Object framework

Business objects

Component Software