



7th Sem
IT
2005

ENGINEERING & TECHNOLOGY EXAMINATIONS, DECEMBER - 2005
DISTRIBUTED COMPUTING
SEMESTER - 7

Time : 3 Hours]

[Full Marks : 70

The questions are of equal value.

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Note : Answer any five questions from the following.

1. Define loosely-coupled and tightly-coupled systems. What is a true distributed system ? Discuss in brief the various distributed computing models. 4 + 2 + 8
2. a) How does RPC facility make the job of distributed application programmer simpler ? Discuss briefly the various communication protocols for RPCs. 2 + 5
b) What is the advantage of lightweight RPCs. Describe some of the techniques used in the LRPC system that make it more efficient than the conventional RPC systems. 2 + 5
3. a) How do clock synchronization issues differ in centralized and distributed computing systems ? Differentiate between internal and external synchronizations of clocks in a distributed system. Internally synchronized clocks are also internally synchronized, but the converse is not true. Explain why. 2 + 3 + 3
b) What is a deadlock ? What are the necessary four conditions for deadlock to occur ? Give examples to prove that if any one of the four conditions is absent, deadlock is not possible. 1 + 2 + 3
4. a) Define computer security which covers the intangible benefits also. Do a cost survey before securing a predefined system. 4
b) What are the potential penetration attempts and attacks to computer system ? 3
c) What is authentication and how many prime types are there ? 3
d) Explain the Basic model of a cryptographic system with a diagram. 4



5. a) What are the different naming structures ? Explain in detail. 5
- b) Differentiate between location independence and location transparency. 4
- c) Write down the difference between static location transparency and location independence. 5
6. a) Enlist the advantages of distributed system over centralized ones and independent PCs. Are there any disadvantages of distributed systems ? If any, discuss them. 4 + 2
- b) Differentiate between bus based multiprocessors and bus based multicomputers. 3
- c) Write down the differences between switched multiprocessors and switched multicomputers. 3
- d) Differentiate between Monolithic kernel and Micro kernel. 2
7. a) What do you mean by concurrency control and two phase locking in case of atomic transaction. 2 + 2
- b) Name the main components of Distributed File System. 4
- c) Define name space. For a hierarchically structured name space, discuss the relative advantages and disadvantages of using a fixed number of levels and allowing an arbitrary number of levels for the hierarchy. 2 + 4
8. a) Describe a method for solving the key distribution problem for an asymmetric crypto system. 5
- b) What do you mean by serializability conflict ? 3
- c) Write short notes on any two of the following : 2 x 3
- i) Digital signature
 - ii) Processor pool model
 - iii) Stateless server.
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**GROUP - B****(Short Answer Type Questions)**Answer any *three* of the following.

3 × 5 = 15

2. ✓ What is RPC ? What are stateless and stateful servers ? 2 + 3
3. Enumerate the features that a global scheduling algorithm should possess. 5
4. What are threads ? How are threads created and terminated ? 1 + 2 + 2
5. What is cryptography ? What is meant by symmetric key cryptography and asymmetric key cryptography ? 2 + 3
6. Describe the token passing approach of achieving mutual exclusion. 5

GROUP - C**(Long Answer Type Questions)**Answer any *three* questions.

3 × 15 = 45

7. What is groupware ? What are the main differences between a network operating system and a distributed operating system ? What are the major issues in designing a distributed operating system ? 2 + 4 + 9 = 15
8. ✗ Describe blocking and non-blocking types of IPC. What are their relative advantages and disadvantages ? What is datagram ? What is the advantage of lightweight RPCs ? Describe some of the techniques used in the LRPC system that make it more efficient than the conventional RPC systems ? 3 + 3 + 2 + 2 + 5 = 15
9. a) Explain the "two-phase locking" protocol used to ensure serializability.
- b) What do you mean by an atomic transaction ? State and explain the acid properties for a transaction.
- c) What do you mean by marshalling ?
- d) How can you prevent deadlocks ? 5 + (1 + 4) + 2 + 3 = 15

10. What are the main differences between the load-balancing and load-s. approaches for process scheduling in distributed system ? Which of the v policies to be used in the implementation of the two approaches are differen which are the same ?

11. Write short notes on any *three* of the following :

3 × 3

- a) Digital signature
- b) ✓ Buffering
- c) Load balancing : centralized vs distributed
- d) ✓ Lightweight RPC
- e) ✓ Multidatagram messages
- f) Processor pool model.

END