



BCA/DBS-602

2024

(6th Semester)

BACHELOR OF COMPUTER APPLICATION

Paper No. : DBS-602

(Distributed Systems)

Full Marks : 70

Pass Marks : 45%

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 45)

*The figures in the margin indicate full marks
for the questions*

1. (a) What is distributed system? Describe the various challenges and issues in a distributed system.

5

- (b) What is the role of middleware? List any two resources of hardware and software which can be shared in distributed system with example.

4

Or

- (c) What are the different types of failure and how are they dealt in distributed systems? 5
- (d) Write a short note on quality of service in distributed systems. 4
2. (a) What are the types of communication paradigm in distributed system? Explain in detail. 5
- (b) Illustrate the role of AJAX. 4
- Or
- (c) Illustrate the differences between RMI and RPC. 5
- (d) Write short notes on the following terms : 4
- (i) Tuple space
- (ii) Message queue
3. (a) What is the significance of clock synchronization in distributed systems? What are the difficulties that arise when synchronizing clocks, in distributed environment? 5

- (b) Explain how synchronization using exclusion improve the utilization of resources. 4

Or

- (c) Briefly explain about the non-token based approaches algorithm along with an example. How does the non-taken based approach ensure fairness among the sites? 5

- (d) What are some of the practical applications of the Bully algorithm? List the pros and cons of Bully algorithm. 4

4. (a) Define fault tolerance. Describe different types of fault in detail. 5

- (b) Write a short note on scheduling in distributed systems. 4

Or

- (c) What is the need for code migration? Explain the code migration issues in detail. 5

- (d) Write a short note on group communication. 4

5. (a) Describe File Caching schemes in brief. 5
(b) Write a short note on Network File System (NFS). 4

Or

- (c) Briefly explain about the file replication. What are some of the advantages of replication? 5
(d) What are the tools for atomic transactions? 4

2 0 2 4**(6th Semester)****BACHELOR OF COMPUTER APPLICATION****Paper No. : DBS-602****(Distributed Systems)****(PART : A—OBJECTIVE)****(Marks : 25)**

The figures in the margin indicate full marks for the questions

A. Choose the most appropriate answer from the given options by putting a Tick (✓) mark in the brackets provided : 1×10=10

1. In distributed system each processor has its own
 - (a) local memory ()
 - (b) clock ()
 - (c) local memory and clock ()
 - (d) processor ()
2. Centralized computing covers many data centers and
 - (a) minicomputer ()
 - (b) mainframe computer ()
 - (c) super computer ()
 - (d) microcomputer ()

3. The capability of a system to adapt the increase service load is called
- (a) scalability ()
 - (b) tolerance ()
 - (c) capacity ()
 - (d) None of the above ()
4. Which of the following two operations are provided by the IPC facility?
- (a) Write and delete message ()
 - (b) Delete and receive message ()
 - (c) Send and delete message ()
 - (d) Receive and send message ()
5. Which is also known as attributed based name services?
- (a) Domain services ()
 - (b) Name services ()
 - (c) Directory services ()
 - (d) None of the above ()
6. Which one is the coordinate selection algorithm?
- (a) NTP ()
 - (b) Lamport's algorithm ()
 - (c) Ring algorithm ()
 - (d) Berkeley algorithm ()

7. Which of the following makes data available for replication?
- (a) Article ()
 - (b) Publisher ()
 - (c) Distributer ()
 - (d) Subscription ()
8. Which one of the properties is **not** requirement for fault tolerance?
- (a) Fault containment ()
 - (b) Fault isolation ()
 - (c) Dynamic recovery ()
 - (d) Fail safe ()
9. Processes on the remote system are identified by
- (a) host ID ()
 - (b) host name and identifier ()
 - (c) identifier ()
 - (d) process ID ()
10. Which among the options below is an invalid state of a thread?
- (a) Running ()
 - (b) Parsing ()
 - (c) Ready ()
 - (d) Blocked ()

B. State whether the following statements are *True (T)* or *False (F)* by putting a Tick (✓) mark against the appropriate answer in the brackets provided : $1 \times 5 = 5$

1. In a distributed system, nodes communicate with each other solely through direct physical connection.

True () *False* ()

2. A distributed system must have a centralized control unit to function efficiently.

True () *False* ()

3. Consensus algorithms are not necessary in distributed system.

True () *False* ()

4. Fault tolerance is easier to achieve in distributed system compared to centralized system.

True () *False* ()

5. Distributed database can offer better performance than centralized database for certain application.

True () *False* ()

C. Answer the following questions briefly : **2×5=10**

1. Explain the concept of scalability in distributed systems.

2. What role do consensus algorithm play in distributed systems?

3. Write the difference between horizontal and vertical scalability in the context of distributed system.

4. What are some common communication models used in distributed system?

5. What are some popular examples of distributed systems in real-world application?

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