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Barasat, Kolkata -700125

Term End Examination 2023

Programme – B.Tech.(CSE)-2018/B.Tech.(CSE)-2019/B.Tech.(CSE)-2020

Course Name – Distributed Systems

Course Code - PEC-601B

(Semester VI)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Indicate the following is not a requirement for a secure distributed file system?
 - a) Confidentiality
 - b) Integrity
 - c) Availability
 - d) Data compression
- (ii) Indicate the following is a classification criterion for distributed mutual exclusion algorithm?
 - a) Time-based
 - b) Event-based
 - c) Resource-based
 - d) All of the above
- (iii) Select which algorithm is an example of a time-based distributed mutual exclusion algorithm?
 - a) Suzuki-Kasami algorithm
 - b) Ricart-Agrawala algorithm
 - c) Maekawa algorithm
 - d) None of the above
- (iv) Select the option below that the slower execution concept can be developed within
 - a) Microkernel
 - b) monolithic kernel
 - c) Both monolithic kernel and microkernel
 - d) None of these
- (v) Choose the application of Which thread management work done by a pure Kernel Level Thread facility?
 - a) Kernel
 - b) Program
 - c) Application
 - d) Information
- (vi) Select one of the best options from following an ethical consideration related to the use of distributed systems?
 - a) Performance optimization
 - b) Resource allocation
 - c) User authentication
 - d) Encryption standards
- (vii) Select the following is a communication protocol used in distributed systems for remote procedure calls?
 - a) SOAP (Simple Object Access Protocol
 - b) REST (Representational State Transfer)
 - c) JSON-RPC (JavaScript Object Notation Remote Procedure Call)
 - d) All of the above

(viii) Identify the following options if one site fails in distributed system

- a) The remaining sites can continue operating
- b) Directly connected sites will stop working
- c) All the sites will stop working
- d) A part of sites will be working

(ix) Identify the below options resources and clients transparency that allows movement within a system is called

- a) Mobility transparency
- b) Concurrency transparency
- c) Replication transparency
- d) Performance transparency

(x) Choose the following is a testing technique used to evaluate the performance of distributed operating systems?

- a) Unit testing
- b) System testing
- c) Load testing
- d) None of the above

(xi) Choose the following is a protocol used for messaging in distributed operating systems?

- a) TCP/IP
- b) HTTP
- c) SMTP (Simple Mail Transfer Protocol)
- d) None of the above

(xii) Select the best definition of Deadlock:

- a) A situation where a process or multiple processes are stuck waiting for each other to release resources
- b) A situation where a process or multiple processes are executing in parallel
- c) A situation where a process or multiple processes have completed their execution and released resources
- d) A situation where a process or multiple processes have exceeded their memory limits

(xiii) Select the best definition of data security.

- a) The protection of computer systems from theft or damage to their hardware, software, or electronic data
- b) The practice of protecting sensitive information from unauthorized access, use, disclosure, or destruction
- c) The process of ensuring that data is complete, accurate, and consistent
- d) The process of identifying and correcting errors in data

(xiv) Indicate which of the following is an example of encryption.

- a) Installing antivirus software on a computer
- b) Restricting access to a database
- c) Encoding a message to make it unreadable without a key
- d) Backing up data to an external hard drive

(xv) Identify an example of a real-life scenario where data security is critical.

- a) Online shopping
- b) Social media
- c) Streaming music
- d) Healthcare records

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Explain the Andrew file system, and how does it work as a distributed file system? (3)
3. Describe some common distributed file system architectures, such as client-server or peer-to-peer? (3)
4. Explain about memory coherence. (3)
5. Explain the key characteristics of a distributed system? (3)
6. Differentiate between distributed shared memory systems and distributed database systems? (3)

OR

Differentiate between horizontal and vertical scaling in distributed file systems? (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

- 7. Explain characteristics of distributed system? (5)
- 8. Describe Advantages and disadvantages of monolithic kernel? (5)
- 9. Explain the concept of a digital signature and how it can be used to verify the authenticity of a message. (5)
- 10. Distinguish between a distributed file system and a distributed database system (5)
- 11. Explain the difference between a distributed file system and a network attached storage (NAS) system. (5)
- 12. Explain the different strategies for handling deadlock in a distributed system. (5)

OR

Discuss the advantages and disadvantages of prevention and avoidance strategies for handling deadlock in a distributed system. (5)

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