Total No. of printed pages = 3

MCA 18250 E 31

Roll No. of candidate | | | | | | | | | | |

10/12/21 2021

M.C.A. 5th Semester End-Term Examination

Elective - III – DISTRIBUTED SYSTEMS

(New Regulation and New Syllabus)

(w.e.f. 2018-2019)

Full Marks – 70 Time – Three hours

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

All questions are compulsory unless otherwise specified.

1. Answer the following: (10 × 1 = 10)

(i) The nodes in the distributed systems can be arranged in the form of?

(a) client/server systems (b) peer to peer systems

(c) Both (a) and (b) (d) None of the above

(ii) In distributed systems, link and site failure is detected by

(a) handshaking (b) polling

(c) token passing (d) None of the above

(iii) The transparency that enables multiple instances of resources to be used, is called

(a) Scaling transparency (b) Concurrency transparency

(c) Performance transparency (d) Replication transparency

(iv) Logical extension of computation migration is called

(a) Thread migration (b) Process migration.

(c) System migration (d) Data migration.

(v) The inherent limitations of distributed system is

(a) Too many nodes in the system (b) Absence of common clock

(c) Absence of shared memory (d) Both (a) and (b)

(e) Both (b) and (c)

[Turn over

(vi) In a distributed file system, when a file's physical storage location changes

(a) file name need to be changed

(b) file name need not to be changed

(c) file's host name need to be changed

(d) file's local name need to be changed

(vii) What enables the migration of the virtual image from one physical machine to another?

(a) Virtual transfer (b) Migration

(c) Virtualization (d) Visualization

(viii) In which algorithm, One process is elected as the coordinator.

(a) Distributed mutual exclusion algorithm

(b) Vector Algorithm

(c) Centralized mutual exclusion algorithm

(d) Lamport's algorithm

(ix) In case of failure, a new transaction coordinator can be elected by _____.

(a) Cristian's Algorithm

(b) Bully algorithm

(c) Both bully and Cristian's algorithm

(d) None of the mentioned

(x) Message passing system allows processes to _____

(a) communicate with one another without resorting to shared data

(b) communicate with one another by resorting to shared data

(c) share data

(d) name the recipient or sender of the message

2. Answer the following : $(5 \times 2 = 10)$

(a) List the types of consistencies in DS?

(b) What is clock skew and clock drift?

(c) A client gets a timestamp of 3:12:30.500 from a time server. The elapsed time between the request and response was 20 msec (0.020 sec). The current time on the client is 3:12:30.510. Using Cristian's algorithm, what is the time set on the client?

(d) What are the disadvantages of distributed systems?

(e) Timestamp the following events occurring at different processes using Lamport's clock.

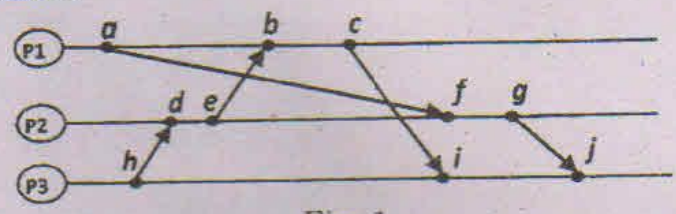

Fig. 1

3. Answer any four (4) from the following. (4 × 5 = 20)

(a) What are the challenges in distributed system?

(b) Discuss briefly about internal and external clock synchronization.

(c) Discuss election algorithms.

(d) What is strongly consistent global state? Discuss any global state recording algorithm.

(e) Explain in detail about process migration.

(f) Explain Huang's Termination detection algorithm for distributed computation.

(g) Discuss the various models of replication for fault tolerance.

4. Answer any *three*. (3 × 10 = 30)

(a) What is mutual exclusion in distributed system? What are the various approaches to solve mutual exclusion in distributed system? Explain any distributed mutual exclusion algorithm. (2+8 = 10)

(b) State and explain Edge-Chasing algorithm for distributed deadlock detection with example. (10)

(c) Write short notes on (5+5 = 10)

(i) Types of Communication in Distributed Systems

(ii) Domain name services

(d) Discuss various architectural models of distributed systems. (10)

(e) Explain any Time stamp ordering protocol in detail. (10)

(f) Explain about the file server architecture. (10)