

SARDAR PATEL UNIVERSITY
M.C.A.(Fifth Semester) Examination
PS05CMCA02 Distributed Systems, Parallel Computing and Simulation
9th April, 2019, Tuesday

Time: 10.00 A.M. to 1:00 P.M.

Total Marks: 70

1. Select most appropriate option for each of the following questions : 8
- (i) Which system runs on a collection of interconnected machines that do not have shared memory, yet looks to its users like a single computer ?
- (A) computer network (B) parallel computer
 (C) distributed system (D) None of these.
- (ii) Which of the following systems requires N^2 crosspoint switches if there are N CPUs and N memory modules ?
- (A) Crossbar switch (B) Omega switching network
 (C) NUMA machines (D) None of these.
- (iii) Which algorithm for processor allocation is concerned with giving each workstation owner a fair share of the computing power ?
- (A) Hierarchical Algorithm (B) Graph-Theoretic Deterministic Algorithm
 (C) Up-Down Algorithm (D) None of these.
- (iv) Which of the following systems has a single run queue ?
- (A) Network Operating System (B) Distributed Operating System
 (C) Multiprocessor Operating System (D) None of these.
- (v) _____ is considered as a numerical computation technique used in conjunction with dynamic mathematical models.
- (A) System (B) System Simulation
 (C) Dynamic computation (D) None of these
- (vi) System analysis, system design and system postulation are the example of _____.
- (A) Types of system (B) Types of system study
 (C) Types of entities (D) Types of activities
- (vii) Which of the following models can only show the values that system attributes take when the system is in balance?
- (A) Analytical model (B) Static model
 (C) Numerical model (D) Dynamic model
- (viii) Consider the following statements about a model:
 S1 : Model is the body of information about a system gathered for the purpose of studying the system
 S2 : There is no unique model for a system
 Which of the following is true?
 (A) Only S1 is true (B) Only S2 is true
 (C) Both S1 and S2 are true (D) Both S1 and S2 are false

2. Answer the following questions in brief (ANY SEVEN) :
- (i) List the major **design issues** for distributed systems.
 - (ii) Define : **logical clock** and **clock skew**.
 - (iii) Write the **advantages** of distributed systems over independent PCs.
 - (iv) Write the advantages of **microkernel design** over monolithic kernel design.
 - (v) What are the advantages of using **diskless workstations** in a distributed system?
 - (vi) Define: Simulation and Entity.
 - (vii) Discuss the applications of simulation.
 - (viii) Write the differences between analog simulation and digital simulation.
 - (ix) Why physical generators of random numbers are not suitable for simulation experiments on computer?
- 3.(A) Define a true distributed system. Describe the main features of a distributed system. 6
- (B) List and describe different kinds of transparencies in a distributed system. 6
- OR
- (B) Write a short note on the workstation model. 6
- 4.(A) Explain the registry-based algorithm for finding and using workstations. 6
- (B) Describe the processor pool model. 6
- OR
- (B) Explain the graph-theoretic deterministic model. 6
- 5.(A) Write the principal entities, attributes and activities to be considered if you have to simulate the operation of a super market. Is it an open or a closed system? Justify your answer? 6
- (B) Explain the simulation of continuous system taking suitable example. 6
- OR
- (B) Differentiate: 6
- (i) Open system and Closed system
 - (ii) Fixed-time step model and Event-to-event model.
- 6.(A) What do you mean by validation of model? Explain the validation of first-time model in detail. 6
- (B) Discuss Distributed lag model with appropriate example. 6
- OR
- (B) (i) Explain the steps involved in the process of a simulation study. 3
- (ii) Write the classification of simulation languages giving at least one example of each. 3

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 (2)