



PIONEER INTERNATIONAL UNIVERSITY

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UNIVERSITY EXAMINATIONS

ACADEMIC YEAR: 2020/2021

UNIT NAME: DISTRIBUTED SYSTEMS

SEMESTER: MAY – AUGUST 2021

UNIT CODE: BSIT 3110

DATE: AUGUST 2021

Main exam

TIME: 2 HOURS

INSTRUCTIONS: Answer question one (30 marks) and any other two

QUESTION ONE (COMPULSORY 30 MARKS)

- a. Define the following terms; Metacomputer, Soft Fault, Remote Method Invocation and Service model. [6 Marks]
- b. Job went for an interview as a Network Administrator at BaseNets Company and he was asked by one panelist to explain if real networks are synchronous or asynchronous. Give your answer and reason for it if you were the one on the Job interview. [4 Marks]
- c. Describe two types of switching fabrics. [6 Marks]
- d. Given RTT of 250 msec, link capacity, $C = 20$ Gpbs and link: 5 Gbit buffer, Calculate N flows. [3 Marks]
- e. Discuss fault tolerance in a process group. [6 Marks]
- f. Differentiate between Thin-Client Model and Thick (Fat)-Client Model. [2 Marks]
- g. Enumerate three necessary conditions for deadlocks. [3 Marks]

QUESTION TWO (20 MARKS)

- a. Give the premise and reality of distributed time. [4 Marks]
- b. What are any three salient features of distributed object architectures? [6 Marks]

- c. Explain any four types of transparency in distributed systems. [4 Marks]
- d. i. In Concurrent transactions on a distributed network, how can we prevent isolation from being violated? [3 Marks]
- ii. Given transactions on three bank accounts, how can you implement (i) above? [3 Marks]

QUESTION THREE (20 MARKS)

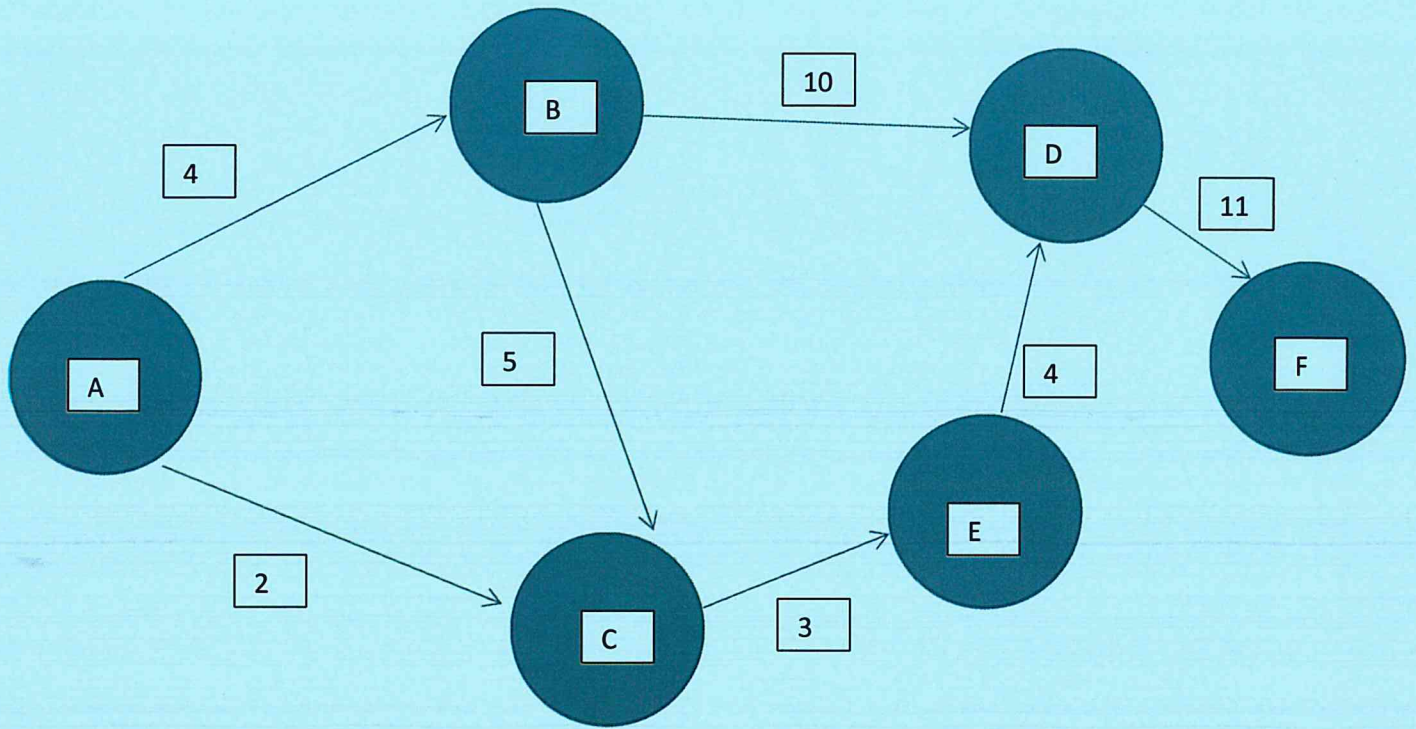
- a. Enumerate any six features of distributed systems that make naming more difficult in distributed systems. [6 Marks]
- b. Give any four advantages of remote procedure call. [4 Marks]
- c. Briefly explain any two most common intra-AS routing protocols. [4 Marks]
- d. In case of process failure and client is unable to locate server, explain the reliable Client-Server communication process in such a scenario. [6 Marks]

QUESTION FOUR (20 MARKS)

- a. Explain the CORBA standard that is an object model for application objects. [6 Marks]
- b. Differentiate between these three routers; area border, backbone and boundary in hierarchical OSPF routing. [6 Marks]
- c. When you are not sure whether the request was carried out, what are the solutions to handle server failures when a server crashes after receiving client request? [6 Marks]
- d. Explain how locks prevent consistency problems. [2 Marks]

QUESTION FIVE (20 MARKS)

- a. Networks fail to perform their duties when a failure occurs. Discuss any two recovery techniques in the event of a network failure. [4 Marks]
- b. List three disadvantages of remote procedure call. [3 Marks]
- c. Explain four BGP messages exchanged between peers over TCP connection verses BGP messages. [4 Marks]
- d. Using Dijkstra's algorithm, provide a solution to the following graph from A to F. [4 Marks]



e. With two examples of each, differentiate between high performance clusters and load balancing clusters. [5 Marks]

