Kafrelsheikh University
Faculty of Engineering
Electrical Engineering Department
Final Exam, 2018/2019
Date: May 2019

4th Year (Computer Engineering & Systems)
Subject: Distributed Systems
Time: 3 hours
Dr. Hatem Mohammed Said Ahmed

Answer all Questions

Question One

1- Classify the distributed systems according to:
- Memory distribution?
- Processes and Granularity
- Connection topology?

2- Draw a schematic diagram for the following static interconnection (with 4 dimension)
- Fat tree (4 levels)
- Line/ Ring
- Tours

3- Draw a flow chart or write Pseudo code to implement the odd-even algorithm at both serial computer and parallel forms?

Question Two

1-What is middleware? How does it contribute to transparency (single system image) in distributed systems?
2-What are the types of faults in distributed systems?
3- What are the twelve objectives of distributed database systems?
4- What are the design requirements of distributed architectures?

Question Three

1-Define the following terms: Cloud computing, Intranet and extranet
2- Draw the Adaptive Fault Tolerance in Real-time Cloud computing **(AFTRC)** model **and explain** its components.
3-Assume the following distributed database of suppliers and parts of a car fabrication company which consists of the following tables:
- Supplier table with attributes (Supplier number and city) contains of 10000 records at site A
- Parts table with attributes (Part number, color) contains 100000 records at site B
- Supplier-parts table with attributes (supplier number and part number) contains of 1000000 records at site A

Also assume the data rate is 50000 bits per second , access delay= 0.1 second, Number of red parts is 10, Number of red shipments by London suppliers=100 000 and every record is stored in 25 byte long .

- If a user wants to execute the following query "Get supplier numbers for London suppliers of red parts" Give 4 possible communication scenarios and calculate the communication time for each scenario.

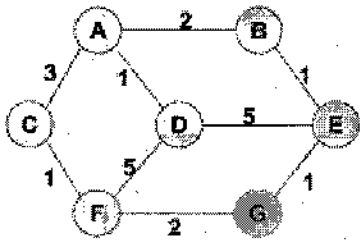
Question Four

1-What are the main types distributed systems architectures models?
2- Define heterogeneity. What are the characteristics of heterogeneity ?
3-Assume you have four processors and you want to execute ten programs where each programs needs four tasks to complete. Assume each task consume one second in the processor. Find the following:

- The time if one processer only execute all programs
- The time if all processors cooperate together to execute the programs at two different parallel scenarios you propose.
- The speed up at the proposed parallel scenarios

Question Five

1- **Draw** the **omega network** for connecting **8 CPUs to 8 memories**.
2- Define scalability, transparencies and openness?
3- Given the network topology in the figure below, Using RIP (routing information protocol) find the final routing tables at router A.



- If router G is shutdown find the same router final table at router A

Question Six

1- Mention few examples of distributed systems
2- What are the different types of switching are used in computer networking?
3- What is the difference between networking and internetworking?
4- What are the difficult for treat and distributed system?