



CENTRAL UNIVERSITY

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

**END OF FIRST SEMESTER EXAMINATION - 2021/2022
QUESTION PAPER**

COURSE TITLE: Mobile and Distributed Computing
System

COURSE CODE : ITEC 403

BSc. Information Technology - LEVEL 400

TIME ALLOWED: TWO (2) HOURS

STUDENT INDEX No.....

INSTRUCTIONS

ANSWER ALL QUESTIONS IN SECTION (A) and (B)

ANSWER SECTION (A) , (B)and (C) ON THE QUESTION PAPER

AND SECTION (B) IN THE ANSWER BOOKLET PROVIDED

**(KINDLY SUBMIT BOTH THE QUESTION PAPER AND THE ANSWER BOOKLET
AFTER THE EXAMS)**

**DO NOT TURN OVER THIS PAGE UNTIL YOU HAVE BEEN TOLD TO DO SO BY
THE INVIGILATOR.**

Part A-

[20 Marks]

Answer all questions in this section for one mark each.

Q- 1 In distributed system, each processor has its own _____

- A. local memory
- B. clock
- C. local memory and clock
- D. none of the mentioned

Q- 2 If one site fails in distributed system then _____

- A. the remaining sites can continue operating.
- B. all the sites will stop working.
- C. directly connected sites will stop working.
- D. none of the mentioned

Q-3 Network operating system runs on _____

- A. server
- B. every system in the network
- C. both server and every system in the network
- D. none of the mentioned

Q-4 Processes on the remote systems are identified by _____

- A. host ID
- B. host name and identifier
- C. identifier
- D. process ID

Q- 5 In distributed systems, link and site failure is detected by _____

- A. polling
- B. handshaking
- C. token passing
- D. none of the mentioned

Q- 6 The capability of a system to adapt the increased service load is called _____

- A. scalability
- B. tolerance
- C. capacity
- D. none of the mentioned

Q- 7. Internet provides _____ for remote login.

- A. telnet
- B. http
- C. ftp
- D. rpc

Q- 8. A paradigm of multiple autonomous computers, having a private memory, communicating through a computer network, is known as

- A. Distributed computing
- B. Cloud computing
- C. Centralized computing
- D. Parallel computing

Q- 9. A set of highly integrated machines that run same process in parallel is known to be.

- A. Tightly coupled.
- B. Loosely coupled.
- C. Space based.
- D. Peer-to-Peer

Q -10. Most of web applications are of

- A. Master/slave architecture
- B. Peer-to-Peer architecture
- C. Three-tier architecture
- D. Client/Server architecture

Q- 11. In a distributed system, information is exchanged through.

- A. Memory sharing
- B. Memory distribution
- C. Message passing
- D. Exceptions

Q – 12. In a peer-to-peer architecture, peers can serve as

- A. Clients
- B. Servers
- C. Middle system
- D. Both A and B

Q- 13. RPC connectors and message queues are mechanisms for

- A. Message retrieving
- B. Message passing
- C. Message delivering
- D. Message Syncing

Q- 14. DFS stands for.

- A. Distributed file system
- B. Defragment file system
- C. Both
- D. None

Q- 15. IP sell stands for

- A. Internet protocols security
- B. Internet protocols section
- C. Both
- D. None

Q-16. Network means-

- A. Communication between two computers
- B. Communication between two devices
- C. Both
- D. None

Q-17. The role of the distributed software is to separate the activities of the various computers and enable them to share their resources.

- A. True
- B. False

Q-18. Transparency is a characteristic of a Distributed System that make known the complexity of system to the end users and application programs

- A. True
- B. False

Q- 19. ubicomp is a concept in software engineering and computer science where computing is made to appear anytime and everywhere.

- A. True
- B. False

Q- 20. The shared memory is easier to program but the distributed memory architecture offers a superior price ratio thus scalability.

- A. True
- B. False

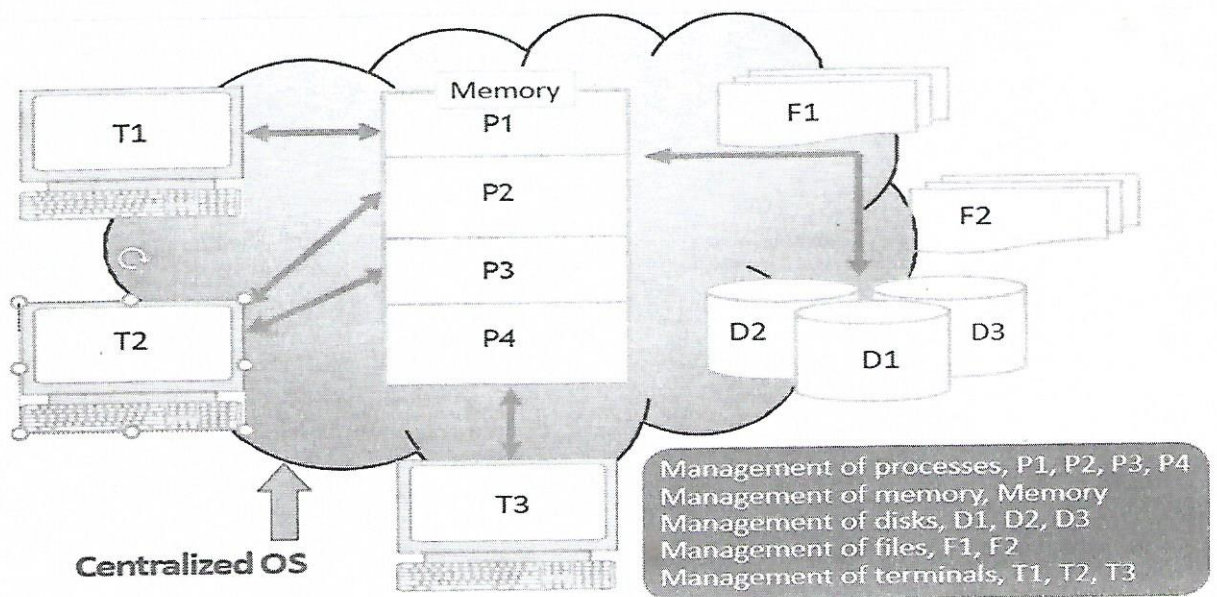
PART – B [20 Marks]

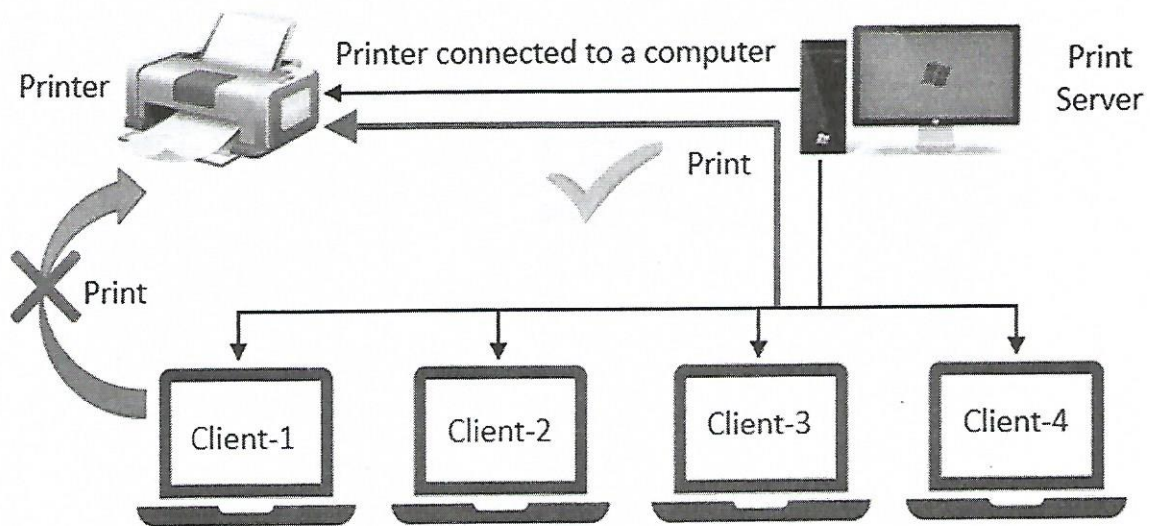
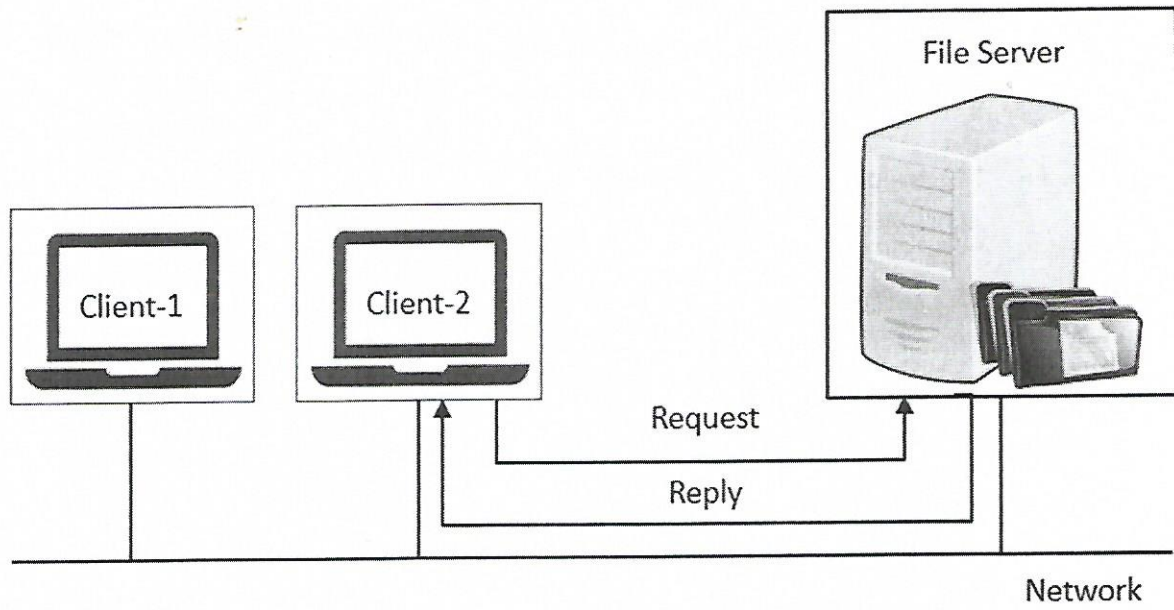
Answer all questions in this section

1- Fill the table below (9 marks)

Basis of Comparison	Local Area Network (LAN)	Metropolitan Area Network (MAN)	Wide Area Network(WAN)
Equipment needed			
Range			
Usage			

2- The diagrams below illustrate the evolution of operation systems. Identify and label them accordingly: (3 marks)





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3- Fill in the gaps (3 marks)

a- A collection of independent computers which are connected through network.” is known as

b- The ordering of events and execution of instructions in time is referred in distributed system as

c- The software is DS enables multiple systems to communicate with each other across different platforms is

4- List two (2) elements of computer clock (2marks)

1-

2-

5-Give the full meaning of the following abbreviation (3marks)

a- SISD

b- SIMD

c- MIMD

Part- C: 60 Marks -

Answer question one (1) and any other two questions from this section

Question – 1 [20 Marks]

Gloria Papafio is a final year student at the University of Cape Coast. She is running a current account with Zenith Bank Ghana with a credit balance of 1000 GHC .

She decided to withdraw via ATM an amount 100 GHC for her groceries. During the process there was a data loss but luckily the distributed system has an in-built fault tolerance system that re-transmitted the transaction. Unfortunately when Gloria received her account balance via text message the balance was 800 GHC instead of 900 GHC .

1- With the help of a diagram explain how the failure in this inter-process communication can be resolved? *(10marks)*

2- Explain the following terminologies as related to a distributed system. **(8 marks)**

1. Heterogeneity **(2)**
2. Robustness **(2)**
3. Openness **(2)**
4. Scalability **(2)**

3- What is a remote procedure call (RPC) *(2marks)*

Question: 2**[20 Marks]**

1- Operation systems (OS) have evolved from first generation to the current third generation of distributed operating system.

With the help of the table below list both the characteristic(s) and goal(s) of the various OS.

TYPE OF OS	CHARACTERISTICS	GOALS
Centralized OS	1. 2. 3.	1.
Network OS	1. 2. 3.	1.
Distributed OS	1.	1.

(10 marks)

2- Explain the following with a help of a diagram.

d- Vertical scaling

e- Horizontal scaling

(6 marks)

3-Give 2 examples of distributed systems and their area of application

*(4 marks)***Question 3****[20 marks]**

1- Compare and contrast the Network operating system and the distributed operating system

in terms of access and performance.

(8 marks)

2- Briefly explain in your own words the reasons that account for the viability of a

distributed system.

(6 marks)

3- Give and explain three (4) advantages of distributed systems over the centralized systems

(6 marks)

Question – 4 **[20 Marks]**

- A. In a distributed system classification is based on hardware, the number of instructions and DataStream. With the help of a diagram distinguish between a tightly coupled and loosely coupled operating system. *(10marks)*
- B. What is transparency in a distributed system? *(2marks)*
- C. List 2 types of transparency in DS and explain one (1) *(3marks)*
- D. Give two features of a good message passing system *(2marks)*
- E. What is the importance a clock synchronization in a distributed system? *(3marks)*