



THE STATE UNIVERSITY OF ZANZIBAR
SCHOOL OF COMPUTING, COMMUNICATION AND MEDIA STUDIES
DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION
TECHNOLOGY

FINAL EXAMINATION

SEMESTER I 2023/2024

DATA COMMUNICATION AND COMPUTER NETWORKS - CS 2103

Date: 28- 02- 2024

Time: 09:00 AM – 12:00 PM

INSTRUCTIONS

1. This paper consists of **TWO** sections, **A** and **B**, which carries 24 and 36 marks respectively.
2. Answer all questions from section A, and any **THREE** questions from section B. Answer more questions other than directed shall not be marked.
3. Cellular phones and any other unauthorized materials are **NOT** allowed in the examination room.
4. **ANSWER EACH QUESTION ON SEPERATE SHEET**
5. This exam consist of six (6) printed pages, including cover page

Answer all questions

[5marks,@0.
marks]

1. Multiple choice questions

- i. What is the sub network address for a host with the IP address 200.10.5.68/28?
- a) 200.10.5.56
 - b) 200.10.5.32
 - c) 200.10.5.64
 - d) 200.10.5.0
- ii). When a station sends a transmission to the MAC address ff:ff:ff:ff:ff:ff, what type of transmission is it?
- a) Unicast
 - b) Multicast
 - c) Anycast
 - d) Broadcast
- iii). When data is encapsulated, which is the correct order?
- a) Data, frame, packet, segment, bit
 - b) Segment, data, packet, frame, bit
 - c) Data, segment, packet, frame, bit
 - d) Data, segment, frame, packet, bit
- iv). Which of the following is not a cause of LAN congestion?
- a) Too many hosts in a broadcast domain
 - b) Adding switches for connectivity to the network
 - c) Broadcast storms
 - d) Low bandwidth
- v). If a hub has three computers connected to it, how many broadcast and collision domains is the hub creating?
- a) Three broadcast and one collision
 - b) Three broadcast and three collision
 - c) One broadcast and three collision
 - d) One broadcast and one collision

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vi). What is the purpose of flow control?

- a) To ensure that data is retransmitted if an acknowledgment is not received
- b) To reassemble segments in the correct order at the destination device
- c) To provide a means for the receiver to govern the amount of data sent by the sender
- d) To regulate the size of each segment

vii). You want to implement a network medium that is not susceptible to EMI. Which type of cabling should you use?

- a) Thicknet coax
- b) Thinnet coax
- c) Category 5 UTP cable
- d) Fiber-optic cable

viii) The network address of 172.16.0.0/19 provides how many subnets and hosts?

- a) 8 subnets, 2,046 hosts each
- b) 8 subnets, 8,190 hosts each
- c) 7 subnets, 8,190 hosts each
- d) 7 subnets, 30 hosts each

ix) When a ping to the local host IP address fails, what is your suggestion?

- a) The IP address of the local host is incorrect.
- b) The IP address of the remote host is incorrect.
- c) The NIC is not functional.
- d) The IP stack has failed to initialize.

x) Disabling which of the following would make wireless local area networks MORE secure against unauthorized access?

- a) MAC (Media Access Control) address filtering
- b) WPA (Wi-Fi Protected Access Protocol)
- c) LEAP (Lightweight Extensible Authentication Protocol)
- d) SSID (service set identifier) broadcasting

ii. Differentiate between the following

[2 marks]

a). Circuit and packet switching

[2 marks]

b). Inter-domain and intra-domain routing

iii. Short answers

[@ 1 mark]

a) Give a corresponding example of client-server program

b) What is the purpose of DNS?

c) What do you understand about layer 3 switch?

d) What is socket programming?

e) What is link local addresses?

f) Why Network Administrator issued ping -t 192.168.200.3

g) What is Vlan?

h) Which applications use port 25 and 110?

i) What is Internet protocol security (IPSec)?

j) What is the purpose loopback address?

4.

a) List any two access technologies for every home access, enterprise access, or wide-area wireless access

[3marks]

b) Suppose you wanted to do a transaction from a remote client to a server as fast as possible. Suggest either UDP or TCP for better communication? Why?

[3 marks]

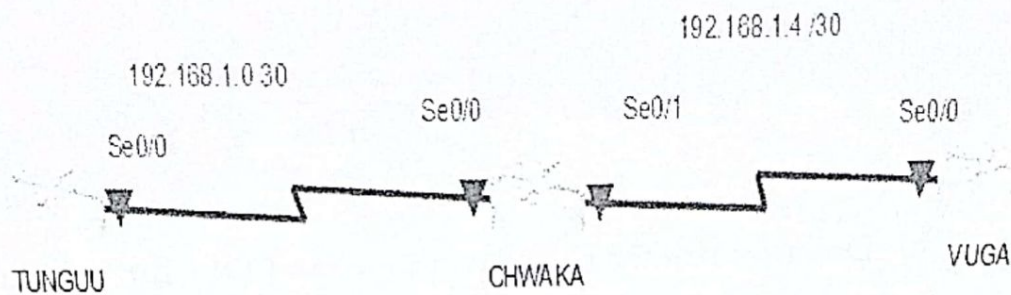
2023/2024

SECTION B (36 marks)

Answer any **THREE** questions, each question carries 12 marks.

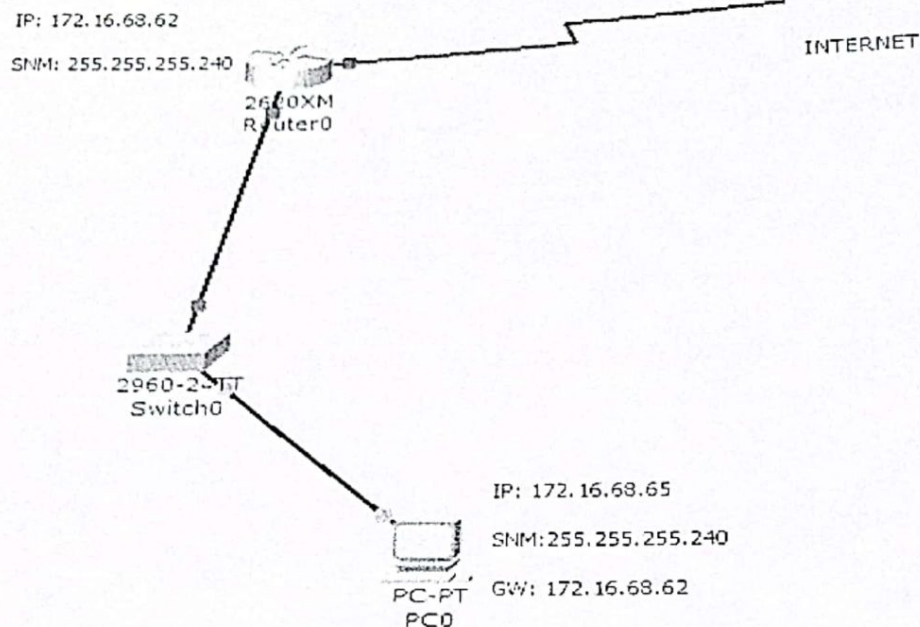
5. a) Why do you need MAC addresses in local area communication while IP addresses are inserted already in your hosts? [3 marks]

b) Consider the topology below



Configure the middle router called CHWAKA to enable communication among both wide area networks, assume clock rate are set in serial interface (Se0/0) of TUNGUU and serial interface (Se0/1) of CHWAKA

- c) From the diagram given below, observe very closely why PC 0 cannot access the internet [4 marks]



6. a) Discuss briefly the seven layers of OSI network model [4 marks]
- b) What are the purposes of OSI layer model [4 marks]
- c) Draw a diagram to demonstrate the sequence of socket API calls and data flow for TCP between server and client [4 marks]
7. a) Briefly discuss the short coming of internet protocol version four, how have been over come in terms of short term and long term plans [6 marks]
- b) Explain briefly the meaning of field of echo reply produced by ping command below: **"Reply from 192.168.1.1: bytes=32 time=2ms TTL=64"** [2 marks]
- c) What information does echo reply **"request timeout"** and **"Destination host unreachable"** provides to network administrator [4 marks]

8. a) Given that 172.16.0.0/20, calculate the number of subnets, [6 marks]
number of hosts per subnet, list the first four valid
subnets, Pick a subnet and write down the range of valid
hosts, subnet mask and broadcast address?
- b) Why standard and extended access-list should be applied
closed to destination and close to source respectively. [4 marks]
- c) Mention four things that must be considered when building
a good network. [2 mark]