UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UCTATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: BNS 1033
COURSE	: INTRODUCTION TO NETWORK
SEMESTER/SESSION	: 1 - 2023/2024
DURATION	: 3 HOURS

Instructions:

1. This booklet contains **5** questions. Answer ALL questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. The use of any type of calculator is not permitted.
5. If in doubt, rise up your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 4 PRINTED PAGE INCLUDING COVER PAGE

QUESTION 1

a) There are two categories of model used in the Networking Principles and Concept, **OSI Model** and **TCP/IP Model**. Differentiate briefly the processes involved between them. (6 marks)

b) Draw all layers in **a)** and give an example of situasion for each layer. (8 marks)

c) Describe the functions of MAC address in the networking devices. Compare MAC address with IP address. Show the translations of MAC address in the ARP protocol. (8 marks)

d) Justify **FOUR (4)** reasons why we need for moving from IPv4 to IPv6. (8 marks)

QUESTION 2

Assume you as a Network Administrator at the UCTATI, you have a blueprint to produce a new block of network address **172.16.0.0** with **8** subnets using **Classfull Addressing Scheme**. Share the information below with your staff to make it easier to understand. Calculation processes are compulsory.

i. Give the class of IP address. (1 mark)

ii. Give the default mask. (1 mark)

iii. Give the broadcast address of the network. (1 mark)

iv. Give the subnet mask. (1 mark)

v. Give the number of addresses in each subnet. (8 marks)

vi. Give the first usable subnet. (1 mark)

vii. Give the first usable address in the first usable subnet. (2 marks)

viii. Give the broadcast address in the first usable subnet. (2 marks)

ix. Give the last usable subnet. (1 mark)

x. Give the last usable address in the last usable subnet. (2 marks)

xi. Give the broadcast address in the last usable subnet. (2 marks)

QUESTION 3

According to the network diagram and information given in Figure 1, express an addressing scheme which utilizes **Variable-Length Subnet Masks (VLSM).** Show the subnet address and subnet mask in the boxes below, color or shade the sub-subnets used in the box. This company will be using the class B address 172.16.0.0. Remember to start with your largest groups first. Complete the related information required in the **Table 1** below. Calculation processes are compulsory. (15 mark)

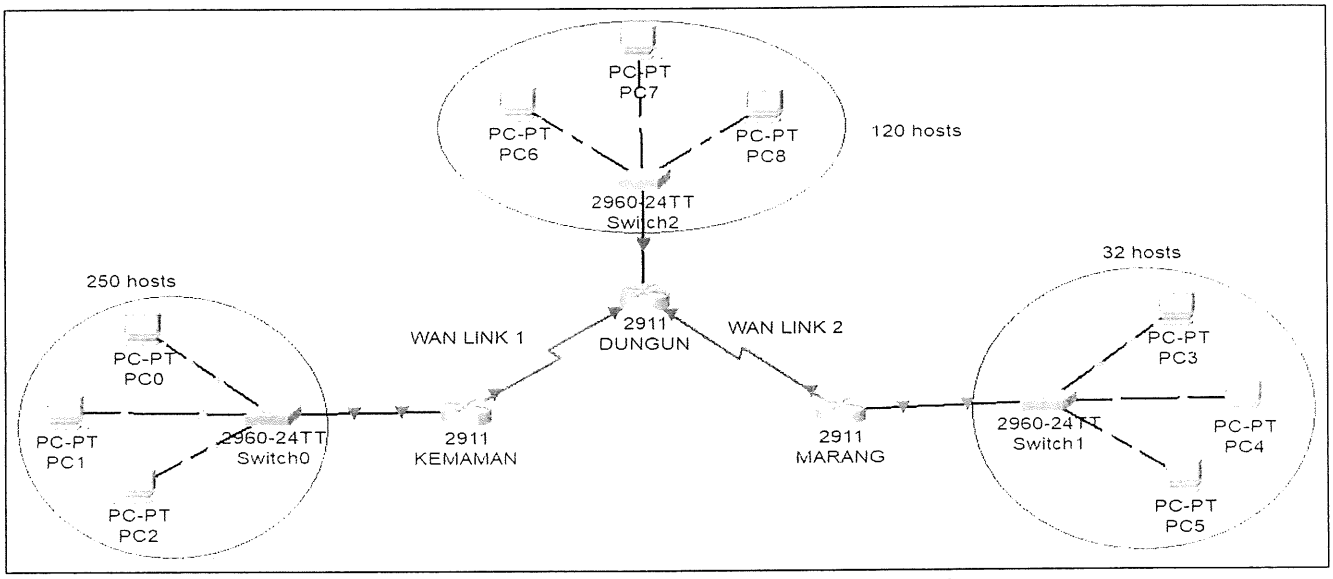

Figure 1: Network diagram with 3 diference subnets.

Table 1

Subnet	Network Name	Number of Hosts	Subnet Address	Subnet mask (/x)	First host	Last host	Broadcast
Subnet A (1st subnet)	*KEMAMAN*	Ai)_____	Aii)_____	Aiii)_____	Aiv)_____	Av)_____	Avi)_____
Subnet B (2nd subnet)	Bi)_____	Bii)_____	Biii)_____	Biv)_____	Bv)_____	Bvi)_____	Bvii)_____
Subnet C (3rd subnet)	Ci)_____	Cii)_____	Ciii)_____	Civ)_____	Cv)_____	Cvi)_____	Cii)_____
Subnet D (WAN Link)	*WAN Link 1*	*2*	Di)_____	Dii)_____	Diii)_____	Div)_____	Dv)_____
Subnet E (WAN Link)	*WAN Link 2*	*2*	Ei)_____	Eii)_____	Eiii)_____	Eiv)_____	Ev)_____

QUESTION 4

There are two types of routing prorocols; static and dynamic. Dynamic Routing protocols are classified into two major categories: distance vector protocols and link-state protocols. Routing Information Protocol (RIP) and Open Shortest Path First (OSPF) are among the most popular Dynamic Routing protocols in TCP/IP suite.

a) Differentiate between Routed Protocol and Routing Protocol. (4 marks)

b) What factors will help you decide whether Static Routing or Dynamic Routing protocols is best for your network? (6 marks)

c) Justify the differences between RIP and OSPF routing protocol. Explain in detail using a diagram and related commands. (10 marks)

QUESTION 5

a) Encapsulation is the computer-networking process of concatenating layer-specific headers or trailers with a service data unit (i.e. a payload) for transmitting information over computer networks. Draw a diagram of the specific processes of encapsulation in the OSI model and explain in detail it's encapsulation activitie in the respective layers. (7 marks)

b) The underlying protocol was and still is fundamental in ensuring the functionality of the network, include both the Transmission Control Protocol (TCP) and the User Datagram Protocol (UDP). Briefly explain the differences between TCP and UDP? (6 marks)

---------- **END OF QUESTIONS** ----------