UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UCTATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: BNS 1033
COURSE	: INTRODUCTION TO NETWORK
SEMESTER/SESSION	: 2 - 2021/2022
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. 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

IP addresses and MAC addresses are both used in modern networks for any communication, on a small local network or a wide area network like the Internet. IP in the computer networking refers to both the IPv4 and IPv6 protocols. IPv6 is the most recent version of IP and is replacing the more common IPv4.

a. What is the difference between IP and MAC addresses? Describe the functions of MAC and IP addresses in the networking devices. Show the translations of MAC and IP addresses in the ARP protocol. (12 marks)

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

QUESTION 2

a. Change the IP address **192.168.100.12** from dotted-decimal notation to binary notation: (Calculation process is compulsory) (2 marks)

b. Change the IP address **11011111 10110000 00011111 01011101** from binary notation to dotted-decimal notation: (Calculation process is compulsory) (2 marks)

c. Find the **netid** and **hostid** of the following IP addresses:

i. **10.23.4.25**

ii. **172.19.67.18** (4 marks)

d. For the subnet mask **255.192.0.0** used in class A, find the number of 1s that defines the subnet. (Calculation process is compulsory) (2 marks)

e. Write subnet mask for network prefix **/30** and **/21**. (2 marks)

QUESTION 3

As a Network Manager, you have been appointed to manage the network infrastuctures at the company TESLA USA. TESLA was assigned an older network address **192.168.19.0** by the previous manager.

a. With a current value of subnet mask **255.255.255.224**, find the number of subnets and how many addresses per subnets are available? List all of the subnets and calculation processes are compulsory. (10 marks)

b. As an improvement, you have a blueprint to produce a new block of network address **172.16.0.0** with 32 subnets. Share the information below with your staff to make it easier to understand.

i. Show the class of IP address.
ii. Show the default mask.
iii. Show the broadcast address of the network.
iv. Show the subnet mask.
v. Show the number of addresses in each subnet.
vi. Show the first usable subnet.
vii. Show the first usable address in the first usable subnet.
viii. Show the broadcast address in the first usable subnet.
ix. Show the last usable subnet.
x. Show the last usable address in the last usable subnet.
xi. Show the broadcast address in the last usable subnet.

(Calculation processes are compulsory) (20 marks)

QUESTION 4

You are designing a network connection for a new TESLA factory at Kemaman Terengganu. As we know, different types of network media have different features and benefits. Not all network media have the same characteristics, and not all media are appropriate for the same purpose.

a. There are two categories of transmission media namely guided and unguided. Differentiate in details in terms of their features, characteristics and benefits. Propose a suggestion to TESLA for the best media selection, and why. (12 marks)

b. As a new network designer, compare and contrast between fiber optic and copper network cables in terms of performance and quality. Show their differences and support your answer with a suitable diagram. (8 marks)

QUESTION 5

There are two types of routing protocols; 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. Write a set of commands on how to activate a static routing protocol in a router. (3 marks)

b. Write a set of commands on how to activate a RIP routing protocol in a router. (3 marks)

c. What factors will help you to decide whether Static Routing or Dynamic Routing protocols is best for your network? (4 marks)

d. Explain in detail using a diagram the Internet Protocol Suite (TCP/IP) model and it's respective applications. (8 marks)

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