Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2022/2023

COURSE NAME	:	DATA COMMUNICATION AND NETWORK
COURSE CODE	:	DAT 20703
PROGRAMME CODE	:	DAT
EXAMINATION DATE	:	JULY / AUGUST 2023
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTION	:	1. ANSWER **ALL** QUESTIONS. 2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK.** 3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA **CLOSED BOOK**

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

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Q1 (a) Calculate the **network IP address** of the following host.

(i) 20.10.10.10/28
(ii) 192.168.10.1/24
(iii) 172.125.100.10/16
(iv) 192.168.10.20/24
(v) 172.16.1.1/16

(10 marks)

(b) Calculate the **broadcast address** of the following host.

(i) 192.168.40.50/25
(ii) 10.10.10.10/8
(iii) 192.168.1.5/30
(iv) 120.1.80.80/8
(v) 10.50.60.10/22

(10 marks)

(c) Discuss appropriate conditions for the implementation of the TCP transmission protocol.

(5 marks)

Q2 (a) Discuss the following types of data communications technology.

(i) Ethernet
(ii) Token Ring
(iii) NetBEUI

(6 marks)

(b) Draw the following topology.

(i) Star
(ii) Mesh
(iii) Bus
(iv) Hybrid

(4 marks)

(c) Draw the similarity layers of TCP/IP and OSI layered reference models.

(4 marks)

(d) List **THREE (3)** components of data communication system.

(5 marks)

(e) Explain the **THREE (3)** components in **Q2(d)** above.

(6 marks)

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Q3 (a) Explain **THREE (3)** advantages of wireless over wired connection.

(6 marks)

(b) State the functions of the following OSI network layer architecture.

(i) Data Link Layer
(ii) Network Layer

(4 marks)

(c) A network topology diagram given in **Figure Q3** implements the IP addressing scheme given in **Table Q3**. Find;

Table Q3

Office	Network	Host IP Addressing Scheme
Headquarters (HQ)	A	10.10.10.10/8
	B	20.20.20.10/8
Branch 1 (BR1)	C	192.168.20.5/24
	D	192.168.10.5/24
Branch 2 (BR2)	E	172.20.20.10/16
	F	172.10.10.10/16

(i) The subnet mask for net B, C, D, E and F.

(5 marks)

(ii) The network address for net A, B, C, D and E.

(10 marks)

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Q4 A local area network for UTHM Pagoh Campus is shown in **Figure Q4**. The network infrastructure management decided that all internal routing interconnection between LAN should be done core1.campusX catalyst switch and all IP configuration scheme uses class B throughout campus which has 20-bit network subnet masking. Show;

(a) The Vlan creation configuration commands in core1.campusX catalyst switch.

(i) Vlan 1
(ii) Vlan 2
(iii) Vlan 3
(iv) Vlan 4
(v) Vlan 5

(5 marks)

(b) The IP address assignment to hosts;

(i) srv1.campusX Server
(ii) Host IP address on Lan 1
(iii) Host IP address on Lan 2
(iv) Host IP address on Lan 3
(v) Host IP address on Lan 4

(10 marks)

(c) The IP routing configuration on LAN 1, 2, and 3 so that all hosts could access srv1.campusX server.

(6 marks)

(d) The IP address for an HTTP server in VLAN 6 which has been added in dist1-b1.campusX catalyst switch. Use the last IP within its host IP range.

(2 marks)

(e) The IP address for an HTTP server in VLAN 7 which has been added in dist1-b2.campusX catalyst switch.

(2 marks)

(f) The dot1Q routing protocol configuration commands in core1.campusX catalyst switch for Vlan1, Vlan2, Vlan3, Vlan4 and Vlan5. Use the last usable IP addressed for each Vlan IP addressing.

(5 marks)

-END OF QUESTIONS –

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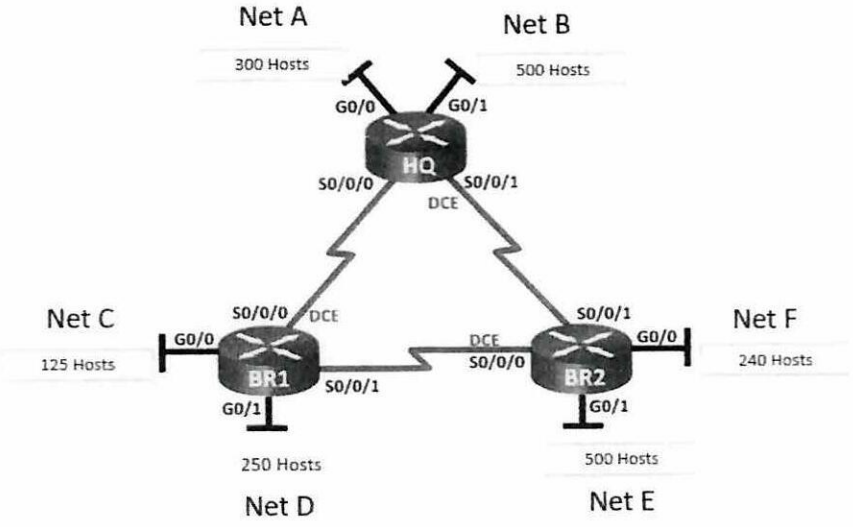

Figure Q3

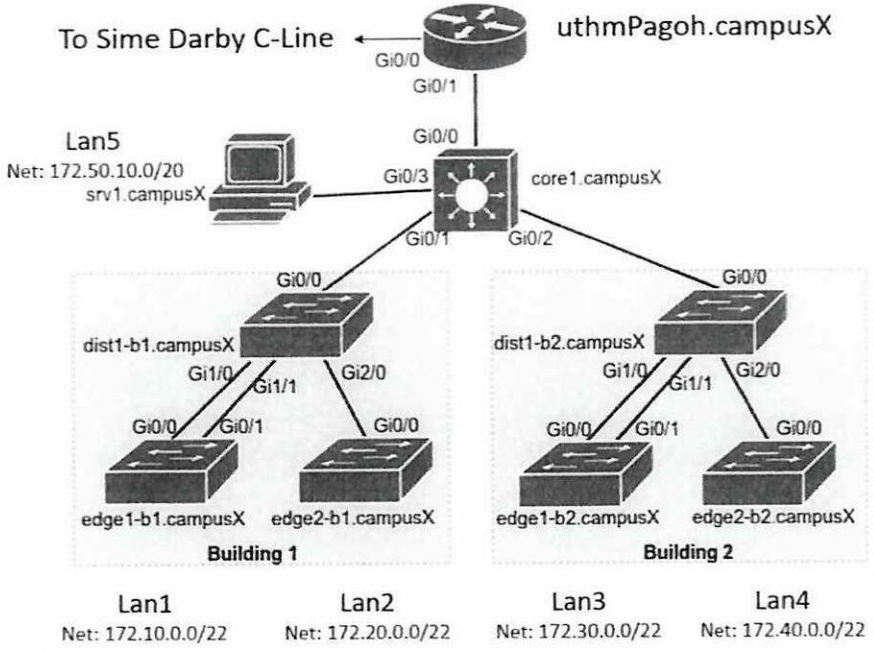

Figure Q4

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