



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2023/2024**

- COURSE NAME : DATA COMMUNICATION AND NETWORKING
- COURSE CODE : DAT 20703
- PROGRAMME CODE : DAT
- EXAMINATION DATE : JULY 2024
- DURATION : 2 HOURS 30 MINUTES
- INSTRUCTIONS :
1. ANSWER ALL QUESTIONS
 2. THIS FINAL EXAMINATION IS CONDUCTED VIA
 - Open book
 - 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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PART A

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

- (i) 172.30.10.130/30
- (ii) 192.168.100.25/28
- (iii) 172.30.10.130/30
- (iv) 10.1.113.75/19
- (v) 128.107.14.191/22

(10 marks)

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

- (i) 192.168.20.5/24
- (ii) 10.10.19.100/8
- (iii) 10.50.60.10/22
- (iv) 120.1.80.80/8
- (v) 192.168.1.5/30

(10 marks)

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

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

- (i) Broadcast
- (ii) Unicast

(4 marks)

(b) Draw the following topology;

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

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(4 marks)

- (c) List **THREE (3)** components of data communication system. (3 marks)

- (d) Explain the **THREE (3)** components in Q2(c) above. (6 marks)

- (e) Draw the similarity layers of TCP/IP and OSI layered reference models. (4 marks)

- Q3**
- (a) Discuss **THREE (3)** advantages of wireless compared to wired connection. (6 marks)

 - (b) State the OSI network layer architecture functions for this following layers.
 - (i) Application Layer
 - (ii) Network Layer(4 marks)

- (c) A network topology diagram given in **Figure APPENDIX A.1** implements the IP addressing scheme given in **Table Q3.1**. Find;

Table Q3.1 IP Addressing Scheme

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 APPENDIX B.1**. 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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APPENDIX A

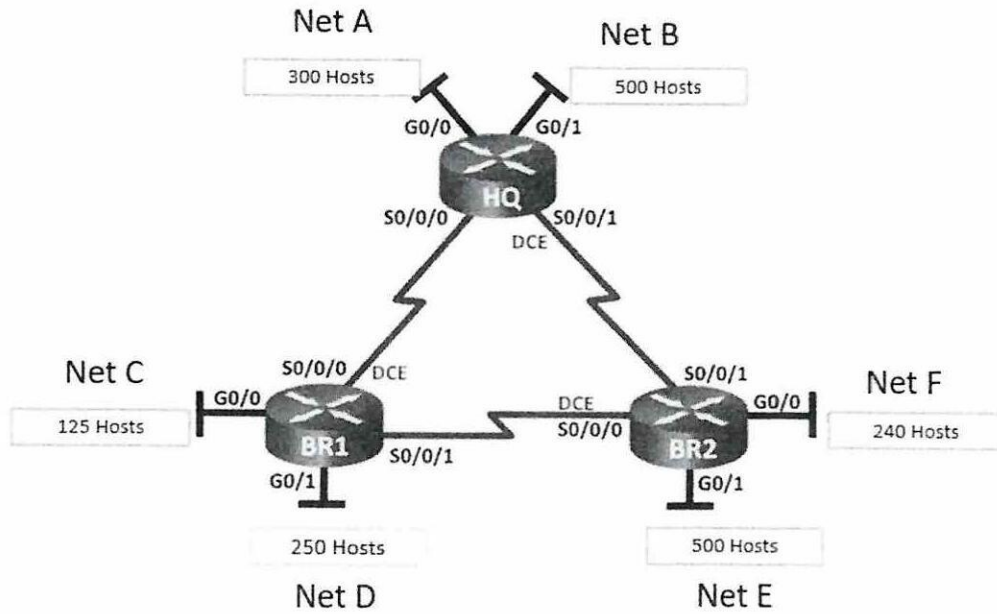


Figure APPENDIX A.1

APPENDIX B

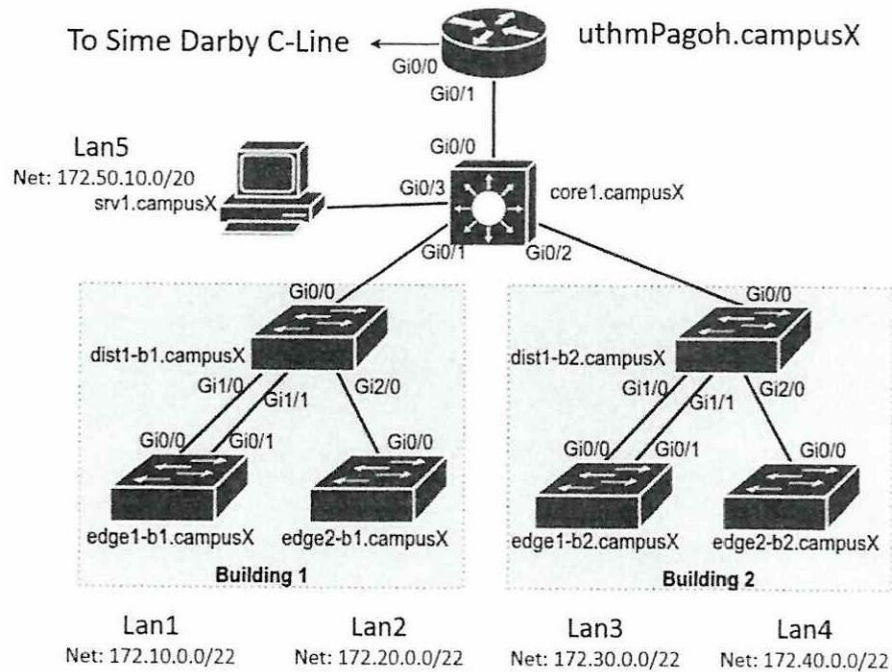


Figure APPENDIX B.1