

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

MID SEMESTER EXAMINATION

WINTER SEMESTER, 2018-2019

DURATION: 1 Hour 30 Minutes

FULL MARKS: 75

CSE 4773: Internetworking Protocols

Programmable calculators are not allowed. Do not write anything on the question paper.

There are **4 (four)** questions. Answer any **3 (three)** of them.

Figures in the right margin indicate marks.

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|-------|---|----|
| 1. a) | What advantage does a circuit-switched network have over a packet-switched network? | 7 |
| b) | Suppose users share a 3 Mbps link. Also suppose each user requires 150 kbps when transmitting, but each user only transmits 10% of the time. | 7 |
| | i. When circuit-switching is used, how many users can be supported? | |
| | ii. For the remainder of this problem, suppose packet-switching is used. Find the probability that a given user is transmitting | |
| c) | How does the Domain Name System (DNS) work? | 5 |
| d) | What is the difference between an intranet and an extranet? | 6 |
| 2. a) | Suppose Host A wants to send a large file to Host B. The path from Host A to Host B has three links, of rates $R_1 = 500$ kbps, $R_2 = 2$ Mbps, and $R_3 = 1$ Mbps. | 8 |
| | i. Assuming no other traffic in the network, what is the throughput for the file transfer? | |
| | ii. Suppose the file is 4000000 bytes. Roughly how long will it take to transfer the file to Host B? | |
| b) | Suppose Alice and Bob are sending packets to each other over a computer network. Suppose Trudy positions herself in the network so that she can capture all the packets sent by Alice and send whatever she wants to Bob; she can also capture all the packets sent by Bob and send whatever she wants to Alice. List some of the malicious things Trudy can do from this position. | 9 |
| c) | Describe the DHCP client-server interaction process with the aid of an appropriate time line diagram. | 8 |
| 3. a) | One of the addresses in a block is 110.23.120.14/20. Find the number of addresses, the first address, and the last address in the block. | 7 |
| b) | An organization is granted the block 130.34.12.64/26. The organization needs four subnetworks, each with an equal number of hosts. Design the subnetworks and find the information about each network. | 10 |
| c) | Describe the necessity and functionality of Network Address Translation (NAT). | 8 |
| 4. a) | Consider sending a 2400-byte datagram into a link that has an MTU of 700 bytes. Suppose the original datagram is stamped with the identification number 422. How many fragments are generated? What are the values in the various fields in the IP datagram(s) generated related to fragmentation? | 8 |
| b) | Multicasting can be emulated using multiple unicasting. What are the potential problems of doing so? Justify your answer with necessary diagrams. | 6 |
| c) | What is the purpose of loopback address? | 5 |
| d) | Compare link-state and distance-vector routing algorithms. | 6 |