UNIVERSITY OF MORATUWA
Faculty of Information Technology

B.Sc. (Hons.) in Information Technology
Level 2 – Semester 2 Examination
IN 2510 – COMPUTER NETWORKS

Time Allowed: 40 Minutes | July 2021

INSTRUCTIONS TO CANDIDATES

1. This paper contains two (2) pages including this cover page.
2. This paper contains the last section, namely Section C.
3. Section C contains two (2) compulsory structure type questions.
4. The total marks obtainable for this section is 20. The marks assigned for each question and parts thereof are included in square brackets.
5. This examination (all three sections A, B & C) accounts for 60% of the module assessment.
6. This is an online open-book examination.
7. Start answering each structure type question using a new page.
8. Answer ALL questions contained in this paper.

Continued…

Section C *[Total Marks allocated: 20 Marks]* - ***Answer All Questions***

Question 1

(a) A *smartphone* user and a *desktop* user connected to the same LAN started browsing the web contents of a remote *web server farm* through a *forward proxy server* in the LAN. The smartphone is connected to the same *switch* through a *wireless access point*. The LAN has a switch, a wireless access point, a *hardware firewall*, a proxy server (forward proxy), and a *router* that connects to the Internet. The remote server farm is comprised of *three computers* (original web servers) that are connected to a reverse proxy server through a *switch*. There is also a *firewall* and an edge *router* in the remote server farm network.

Draw a network diagram to show how the two users are connected to the web server farm. Indicate the following items in your diagram:

LAN: smartphone, desktop, switch, access point, proxy (forward), router, and firewall
Server-farm Network: reverse proxy (reverse), switch, router, and firewall

[6 Marks]

(b) (i) Contract the following IPv6 address:
d5c1:0042:db2c:0000:0000:a4d9:0000:0b4d

[2 Marks]

(ii) List the rules you used to contract the IPv6 address in section *(b)(i)*.

[2 Marks]

Question 2

You have been asked to subnet your class B network 141.128.0.0 to create 300 LANs, each with at least 100 hosts.
You are required **to use** the Subnet Zero and All-Ones subnets as well.

(a) What is the subnet mask of the LANs you created?

[2 Marks]

(b) What is the maximum number of hosts that can be accommodated within a single LAN?

[2 Marks]

(c) Write down the subnet addresses of the first two LANs.

[2 Marks]

(d) Specify the usable range of host addresses for the first two LANs.

[4 Marks]

End of Paper