DUBLIN INSTITUTE OF TECHNOLOGY

DT211C BSc. (Honours) Degree in Computer Science (Infrastructure)

Year 1

SUMMER EXAMINATIONS 2017/2018

NETWORKING 1 - FUNDAMENTALS [CMPU1021]

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FRIDAY 11TH MAY 9.30 A.M. – 11.30 A.M.

DURATION
TWO HOURS

INSTRUCTIONS TO CANDIDATES

ANSWER **THREE** QUESTIONS OUT OF **FOUR**.

ALL QUESTIONS CARRY EQUAL MARKS.

1 BONUS MARK WILL BE AWARDED TO EACH STUDENT

NO CALCULATORS PERMITTED IN THIS EXAM

Question 1

a) Fully compress the following IPv6 Addresses

i. 63e4:0000:02f9:0000:00b3:0000:5153:e12b
ii. 0000:580d:64ff:3d9e:003f:cde2:0000:0000
iii. 0000:00d9:ce07:0000:0000:008e:0000:0000
iv. 0001:2fe9:0000:f72b:0000:9558:0064:86d6

(12 marks)

b) You have a device with a MAC address of 13-05-66-29-b6-83. What will be the automatically generated link-local address? Explain your answer

(9 marks)

c) Identify and explain what the three types of IPv6 address are.

(12 marks)

Question 2

a) With the aid of a diagram, show the IEEE 802.3 Ethernet Frame Format

(12 marks)

b) Explain the two methods of Frame Forwarding used on Cisco Switches

(9 marks)

c) Provide and explain the issues associated with IPv4

(12 marks)

Question 3

a) All network components fall into 1 of 3 categories. Identify which category the following devices fall:
   - Copper
   - Network Printers
   - Security Cameras
   - Routers
   - Firewalls
   - Wireless

(12 marks)

b) What is the difference between User EXEC Mode and Privileged EXEC mode?

(9 marks)

c) Explain the difference between Protocol Models and Reference Models

(12 marks)

Question 4

a) Convert the following values from decimal to binary (show your workings)
   170
   55
   19

(9 marks)

b) You are in charge of a network that allows a total of 254 users (192.168.10.0/24), but the company has a total of 106 employees; 4 in HR, 4 in Accounting, 2 in Legal, 11 in IT, 55 in Sales and 30 in the Warehouse. You need to create subnets that would allow for these number of users and prevent the waste of IP addresses as much as possible.
   I. Subnet Masks for each subnet
   II. Network Addresses
   III. Broadcast address for each subnet
   IV. Valid host ranges on each subnet

(24 marks)