

THARAKA



UNIVERSITY

COLLEGE

(A Constituent College of Chuka University)

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COSC 361: COMPUTER NETWORKS I

STREAMS: BSC (COSC) Y3S1

TIME: 2 HOURS

DAY/DATE: TUESDAY 07/04/2020

8.30 AM – 10.30 AM

INSTRUCTIONS:

- Attempt **Question 1** and any other **TWO** from **SECTION B**
- Marks are awarded for clear and concise answers
- **ONLY** the first **THREE** Questions attempted will be marked (**Question one inclusive**)

Question ONE [30 Marks]

(a) Give **ONE** Difference and **ONE** similarity between Ethernet and WIFI network. [4 Marks]

(b) Create a Supernet from the following networks: **192.168.55.244** and **192.168.140.120**
[4 Marks]

(c) Describe the benefits of aggregating routes in large networks. [4 Marks]

(d) Differentiate between Broadcast and Point-to-Point Networks. [4 Marks]

(e) Explain the mechanism that Ethernet applies in detection of MAC frame errors [4 Marks]

(f) Which command would you type on a windows operating system's command prompt when you want to access the following network information:

(i) MAC address of the NIC [2 Marks]

(ii) IP address of the host [2 Marks]

(g) Describe **THREE** limitations of dividing a LAN into subnets and using routers to link the subnets. [6 Marks]

Question TWO [20 Marks]

- (a) Describe the key function of the following application layer protocols. **[10 Marks]**
 (i) DNS (Domain Name System)
 (ii) Telnet
 (iii) SMTP
 (iv) FTP
 (v) HTTP
- (b) Under what circumstances would applications require TCP over UDP **[4 Marks]**
- (c) Using a diagram, illustrate TCP three way handshake **[6 Marks]**

Question THREE [20 Marks]

- (a) Describe CSMA/CD (carrier sense multiple access with collision detection) media access protocol employed by Ethernet LANs **[10 Marks]**
- (b) Briefly describe the role played by the following fields of a Ethernet frame **[10 Marks]**
 (i) DA
 (ii) Length/type
 (iii) FCS
 (iv) SFD
 (v) Data

Question FOUR [20 Marks]

- (a) Identify **ONE** difference and **ONE** similarities between a bridge and a switch when deployed in local area networks. **[4 Marks]**
- (b) Justify by giving **THREE** reasons why a network administrator may decide to create VLANs in a network. **[6 Marks]**
- (c) Using a diagram illustrate the CSMA/Collision Avoidance media access mechanism employed by IEEE 802.11 wireless networks clearly showing RTS-CTS exchange **[10 Marks]**

Question FIVE [20 Marks]

- (a) Consider a computer **X** with the following **IPV4** network configurations:
- | | |
|------------------------|----------------------|
| IP Address | 192.168.1.5 |
| Subnet Mask | 255.255.255.0 |
| Default Gateway | 192.168.1.6 |
| DNS Server | 192.168.1.7 |

- (i) What is the address of the network that Computer **X** is attached to **[4 Marks]**

(ii) Suppose computer **X** requests a web access to **http://www.mail.yahoo.com**, which IP address will computer **X** query in order to determine the IP address of www.mail.yahoo.com [4 Marks]

(iii) Suppose the above addresses are based on classes, which class would you classify the network that Computer **X** is attached to [4 Marks]

(iv) Suppose the addresses are based on CIDR, how would you represent the IP address of machine X using slash (/) notation [4 Marks]

(v) What is the IP address of the machine that computer **X** would **route** its requests/packets to in order to get them out of the network it's attached to [4 Marks]
