CHUKA UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE

RESIT / SPECIAL EXAMINATION

COSC 363: COMPUTER NETWORKS 11

STREAMS: BSC COMP.SCI/ BSC APPLIED COMP. SCI **TIME: 2 HOURS**

DAY/DATE: TUESDAY 17/11/2020 **8.30 A.M. – 10.30 A.M.**

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) Create a Supernet from the following networks: **192.168.55.244** and **192.168.140.120** [8 Marks]

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

(c) Which command would you type on a windows operating system's command prompt when you want to access the IP address of the host [2 Marks]

(d) Describe **TWO** limitations of dividing a LAN into subnets and using routers to link the subnets [4 Marks]

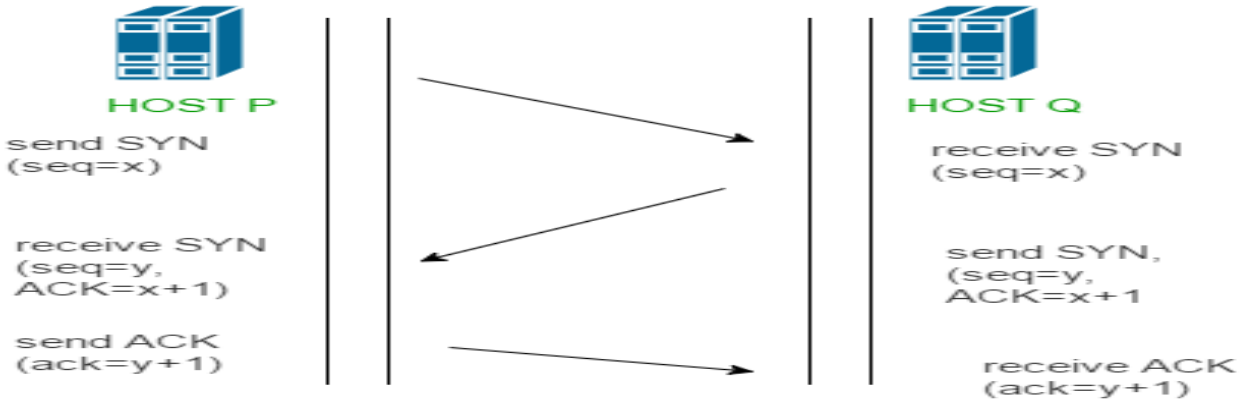
(e) Justify by giving **THREE** reasons why a network administrator may decide to create VLANS in a network [6 Marks]

(f) What is the role of sequence number field in a TCP segment [4 Marks]

(g) Differentiate between IP address and MAC address [2 Marks]

QUESTION TWO [20 MARKS]

(a) The diagram below illustrates a **THREE** way handshake mechanism employed by applications that use TCP at transport layer. Explain what is happening in each of the tasks pointed by arrows [12 Marks]



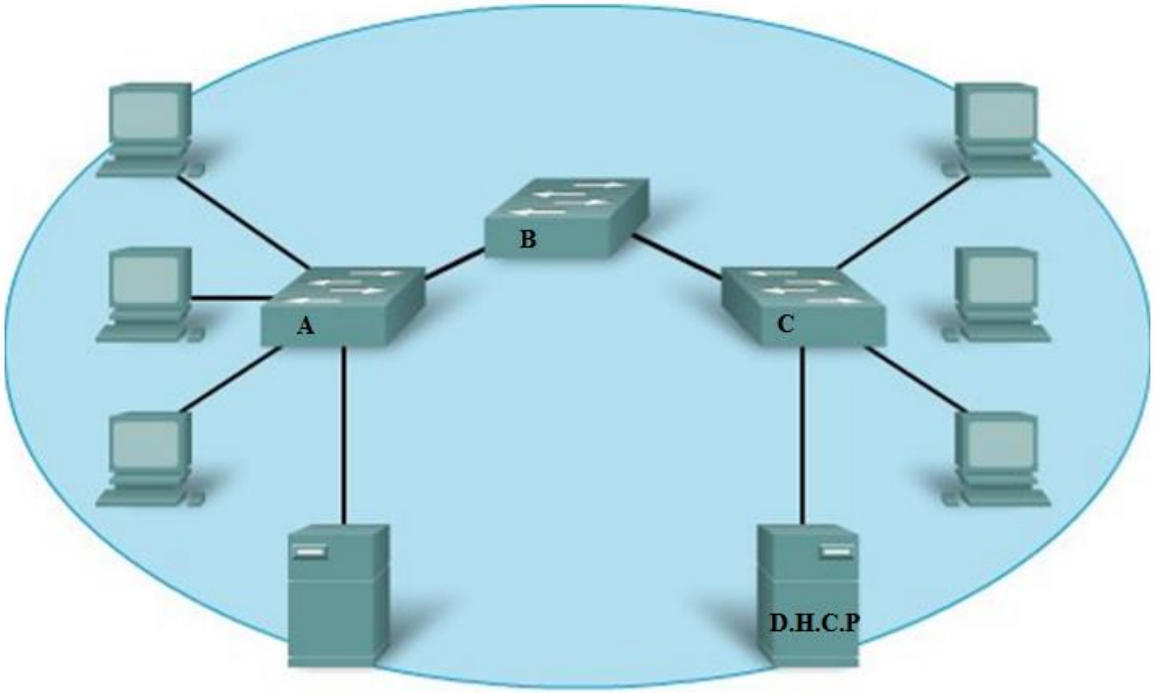
(b) Differentiate between the following in relation to routing:

(i) Linkstate and Distance vector routing algorithms [4 Marks]

(ii) Flow control and congestion control [4 Marks]

QUESTION THREE [20 MARKS]

The diagram below illustrates a network connected with switches A,B and C. Study it and use it to answer questions that follow.



(i) Describe the highest layer of OSI reference model that protocols in devices A,B and C are expected to operate in [4 Marks]

(ii) What is the name given to the addresses that devices A,B and C use to forward data across the hosts.Additionally,give the number of bytes in each address [6 Marks]

(iii) What is the role of the Server labeled D.H.C.P [2 Marks]

(iv) Using a diagram, illustrate four steps that describe the operation of the server labeled D.H.C.P [6 Marks]

(v) Describe the effect on network performance if switch **B** is replaced with a router [2 Marks]

QUESTION FOUR [20 MARKS]

Network performance refers to measures of service quality of a network as seen by the customer.

(a) Justify why a network administrator needs to measure network performance [4 Marks]

(b) Discuss **FOUR** techniques for improving network performance [16 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]
