University of Ruhuna - Faculty of Technology

Bachelor of Information and Communication Technology

Level 2 (Semester 2) Examination – September 2020

Course Unit: ICT2223 Computer Networks (Theory) **Time: 2 hours**

Answer all **four** questions

1.

I. Define **two (2)** basic activities that take place in following layers of the OSI 7-layer model.

II. Even though ring technology which was originally used for constructing LAN has been recently replaced by star technology, ring technology can still be found integrated in MAN/WAN technologies. Explain **two (02)** benefits of ring architecture used in implementing MAN.

III. Define the suitable operational layer for each of the following protocols. You should mark (√) in the correct box.

Protocol	Application Layer	Transport Layer	Internet Layer	Link Layer
DNS				
SMTP				
IPSec				
ARP				
ICMP				
SNMP				

IV. Briefly Explain the main difference/s of the following terms.

a. Peer-to-Peer interaction and a Client-Server Interaction

b. Connection-oriented service and Connectionless service

2.

I. A class C network 200.138.1.0 is sub-netted with a subnet mask of 255.255.255.252.

a) Estimate the CIDR notation

b) Estimate the number of hosts that can be assigned for each network.

II.

a) Find the error in the following IP Address

- 111.056.045.78

b) Find the class of the following addresses

- 158.223.1.108
- 227.13.14.88

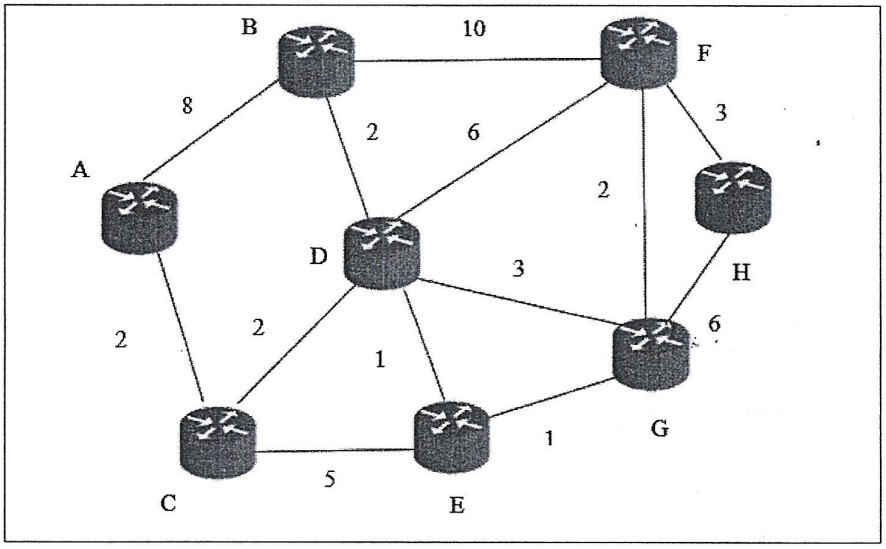
III. A three-way handshake is used to establish a TCP connection. Explain the main stages of the three-way handshake.

IV. Briefly explain the two (02) factors which can be used to design a networking project.

3.

I. Define three (03) types of Data Link Layer Protocols and briefly explain them.

II. Consider the following topology with distances and find the shortest path between Router A to Router H by using **link state routing algorithm**. Give your steps in table.



III. Write short notes of the following topics

a) ADSL

b) Multiple Access protocol

IV. Define four (03) framing methods that are widely used in Computer Networks.

4.

I. Your Internet Service Provider has given you the following information regarding your office data link.

- LAN interface of the switch – 192.10.50.20
- Subnet- 255.255.255.224

a) What is the network address?
b) What is the broadcast address for the specified subnet?
c) How many usable IP addresses are available?

II. ABC company has head office (Colombo), Galle branch, Kandy branch, Matara branch and several departments. The network address of the company is given 192.168.1.0/24. Answer the following.

a) Find the network address of the company main network.

b) Suppose each branch should have same number of hosts. Calculate network address and subnet masks of four branches.

c) The head office in Colombo divided in to four departments and number of hosts of the departments as given below.

Department A-16 hosts

Department B-46 hosts

Department C-2 hosts

Department D-10 hosts

Provide the subnet address, subnet mask, first address and broadcast addresses for the above departments.