



65

**RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES**

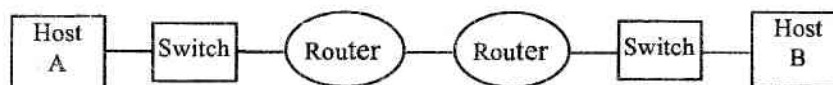
**B.Sc. (General) Degree in Information and Communication Technology
Second Year - Semester II Examination – February/March 2019**

ICT 2305 – COMPUTER NETWORKS

Time: Three (3) hours

Answer All questions

1.
 - a) Identify and discuss two disadvantages of computer networking. (4 Marks)
 - b) Draw an appropriate diagram to illustrate how to connect two separate LANs using the most suitable networking devices. Label all of the devices in the diagram. (6 Marks)
 - c) Write short notes on each of the following:
 - i. MANs.
 - ii. HANs. (6 Marks)
 - d) Explain the *ring* network topology. (4 Marks)
2.
 - a) Briefly describe the reasons why a layered network model is used in networking. (4 marks)
 - b) Explain the following responsibilities of the network interface layer of the TCP/IP reference model.
 - i. Error control.
 - ii. Flow control.
 - iii. Media access control. (6 marks)
 - c) Explain the difference between TCP and UDP. (5 marks)
 - d) Two host computers are connected via two switches and two routers as follows:



Draw a block diagram to show the TCP/IP layers that need to be implemented in each of the above devices. (5 marks)

3. a) Design factors, related to the transmission medium and the signal, determine the data rate and distance. Explain two of them. (4 marks)
- b) Identify the components that make up a coaxial cable and show them in a figure. (6 marks)
- c) Explain what is meant by Frequency-Division Multiplexing (FDM). (5 marks)
- d) Explain the virtual circuit approach in packet-switching networks. (5 marks)

4. a) Discuss the need for framing in communication networks. (4 marks)
- b) Explain the bit-stuffing framing method. (5 marks)
- c) The following character encoding is used in a data link protocol:

A : 01000111
 B : 11100011
 FLAG : 01111110
 ESC : 11100000

Assuming a framing protocol that uses bit stuffing, show the bit sequence transmitted (in binary) over the link when the frame contains the following characters:

ABESCFLAG (5 marks)

- d) Explain the use of Stop-and-Wait protocol for noisy channels. (6 marks)
5. a) Explain the use of IP addresses in IPv4 datagrams. (4 marks)
- b) What is network mask? Give the default network masks in CIDR notation for each of the network classes A, B, and C. (6 marks)
- c) What is subnetting? (4 marks)
- d) Find the number of addresses in the block containing the IP address 192.168.1.35/27. What the first address and the last address in this block. (6 marks)

END