



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

**B.Sc. (Information and Communication Technology) Degree
Second Year - Semester II Examination – October/November 2017**

ICT 2305 – COMPUTER NETWORKS

Time: Three (3) hours

Answer All questions

- Q1.** (a) List four types of communication facilities available in computer networks. [4 Marks]
- (b) Explain the use of the following devices in computer networks:
- i. Repeaters.
 - ii. Wireless Access Points.
 - iii. Firewalls. [6 Marks]
- (c) Write short notes on each of the following:
- i. Enterprise Private Networks.
 - ii. Virtual Private Networks. [6 Marks]
- (d) Discuss the advantages and disadvantages of star network topology. [4 Marks]
- Q2.** (a) Explain the importance of having a clear interface between two layers in layered network architecture. [4 marks]
- (b) Which layers of the OSI model are implemented in routers? Explain your answer. [5 marks]
- (c) Explain the following responsibilities of the data link layer of the OSI reference model.
- i. Flow control.
 - ii. Media Access Control. [6 marks]
- (d) Relate the layers of the OSI reference model to the layers of the TCP/IP model. [5 marks]

- Q3. (a) Define carrier signal and its role in analog transmission. [4 marks]
 (b) Explain the following digital modulation techniques:
 i. Amplitude-shift keying (ASK).
 ii. Frequency-shift keying (FSK). [6 marks]
 (c) Identify the three components that make up a fiber-optic cable and show them in a figure. [5 marks]
 (d) Explain the advantages of optical fiber cables. [5 marks]
- Q4. (a) Discuss the need for multiplexing in communication networks. [5 marks]
 (b) Explain what is meant by Wavelength-Division Multiplexing (WDM). [5 marks]
 (c) Assume five channels, each with an 80kHz bandwidth, are to be multiplexed together. Find the minimum bandwidth of the link,
 i. If there are no guard bands.
 ii. If there is a guard band of 10kHz between the channels. [6 marks]
 (d) Explain the datagram approach in packet-switching networks. [4 marks]
- Q5. (a) Why IP is called “an unreliable datagram delivery service”? [4 marks]
 (b) Explain the dotted decimal notation in IPv4 using a suitable example. [5 marks]
 (c) What is network mask? Explain its use with a suitable example. [5 marks]
 (d) Suppose an organization is given the IP block 17.12.0.0/25, which contains 128 addresses. The organization needs to divide this address block into three subnets of 64, 32 and 32 addresses. Find the network masks for each of the subnets. [6 marks]

END