



Library
Faculty of Applied Sciences
Rajarata University of Sri Lanka

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

**B.Sc. (General) Degree in Applied Sciences
Third Year - Semester I Examination – November/December 2016**

COM 3401 – DATA COMMUNICATION AND NETWORKING

Time: Three (03) hours

Answer all questions.

1. a) What is a computer network? (3 marks)
 - b) What is a Data Communication System? Explain using a diagram. (5 marks)
 - c) Briefly describe any four (4) key tasks that must be performed in a data communication system. (4 marks)
 - d) Data transmission occurs between transmitter and receiver over a transmission medium in the form of electromagnetic waves/signals. Briefly explain three (3) properties of signals. (5 marks)
 - e) What are the 3 major impairments, generally transmission media suffer from? (3 marks)
- (20 marks)**
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2. a) What does it mean by modulation and demodulation of a signal? (4 marks)
 - b) Briefly explain digital modulation techniques. (6 marks)
 - c) Give two (2) advantages and two (2) disadvantages of computer networks. (4 marks)
 - d) What are the two (2) types of networks classified based on the functional relationship. Briefly explain. (4 marks)
 - e) What is a topology? Give an example. (2 marks)
- (20 marks)**

3. a) What are the main layers in TCP/IP model? Give the main function of each layer. (5 marks)
- b) What is a protocol? Give two (2) examples. (3 marks)
- c) Compare and contrast the two (2) major protocols in transport layer. (6 marks)
- d) What is forward error control (FEC) and backward error control (BEC)? (4 marks)
- e) Error correction is much more difficult than error detection. Explain. (2 marks)
- (20 marks)**
4. a) An organization with 4 departments has the following IP address space: 10.2.22.0/23.
As the systems manager, you are required to create subnets to accommodate the IT needs of 4 departments. The subnets have to support 210, 60, 50, and 36 hosts respectively. What are the 4 **subnetwork** numbers? (8 marks)
- b) Given the following Host IP Address, Network Mask and Subnet mask find the following information.
- Host IP Address: 192.168.18.43
- Network Mask: 255.255.255.0
- Subnet Mask: 255.255.255.192
- i. Network Address (1 mark)
 - ii. Broadcast Address (1 mark)
 - iii. First and the last host address of the network (2 marks)
 - iv. Total number of subnetworks we can create. (2 marks)
 - v. Number of hosts per subnetwork (2 marks)
 - vi. Subnetwork addresses. (4 marks)
- (20 marks)**
5. Write short notes on any four (4) of the topics given below.
- a) Internet Access Technologies
 - b) Cloud Computing
 - c) Fog Computing
 - d) SDN
 - e) IoT
 - f) VPN
 - g) Transmission Media
 - h) Context-Aware Computing
- (5*4=20 marks)**

END.