



RAJATRATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES, MIHINTALE

B.Sc. (General) Degree in Applied Sciences
Third Year Semester I Examination - October/November 2015

COM 3401 – Data Communication and Networking

Answer ALL Questions

Time: 3 Hours

- Q1.** (a) Identify the key elements of a data communications system. [5 Marks]
(b) Explain the following tasks in a data communications system.
i. Transmission system utilization.
ii. Recovery.
iii. Security. [6 Marks]
(c) What is the difference between a continuous signal and a discrete signal? [4 Marks]
(d) What are the advantages of digital transmission? [5 Marks]
- Q2.** (a) Explain the need of modulation techniques and the role of the carrier signal in data transmission. [4 marks]
(b) Identify the properties of an analog signal that can be used for modulation. [4 marks]
(c) Briefly explain the modulation techniques that use the properties identified above in part (b). [6 marks]
(d) What is Digital Modulation? Briefly explain the ASK and FSK digital modulation techniques. [6 marks]
- Q3.** (a) Differentiate between guided media and unguided media. [4 marks]
(b) Why are the wires twisted in twisted-pair cable? [4 marks]
(c) Identify the three basic components that make up a fiber-optic cable and show them in a figure. [6 marks]
(d) Explain the advantages of optical fiber cables. [6 marks]

- Q4.** (a) Explain how a computer network can be used as a powerful communication medium among employees in a business. [6 marks]
- (b) Explain the use of the following devices in computer networks:
- i. Modem.
 - ii. Switch.
 - iii. Router.
- [6 marks]
- (c) Write short notes on each of the following:
- i. Broadcast networks.
 - ii. Peer-to-peer networks.
- [4 marks]
- (d) Explain the *star* network topology. Give one advantage and one disadvantage of it. [4 marks]
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- Q5.** (a) What do you mean by layered network architecture? [4 marks]
- (b) Briefly describe the main functions of each of the first three layers in the OSI model. [6 marks]
- (c) How do the layers of the Internet model correlate to the layers of the OSI model? [6 marks]
- (d) Briefly discuss when to use TCP and when to use UDP. [4 marks]