Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Computer Science and Technology
300 level 1st Semester Examination – May/July 2017
SCT377-3 Data Communication and Networking

Uva Wellassa University

Instructions to candidates
Time allocation: Three (03) hours
Number of questions: Six (06)
Mark allocation: 100
Answer all the questions.

1.
   a. List the five (05) components of data communication system. (2 mark)
   b. Briefly explain the main four (04) characteristics that are used to measure the effectiveness of communication. (4 mark)
   c. What are the differences between Metropolitan Area Network (MAN) and Wide Area Network (WAN)? (4 mark)

2.
   a. Briefly explain the transmission impairments. (6 mark)
   b.
      i. The power of a signal is 10mW and power of the noise is 1μW. What is the value of Signal To Noise Ratio (SNR)? (2 mark)
      ii. Calculate SNR_{dB} using the value of SNR. (2 mark)

3.
   a. How do the layers of the TCP/IP model correlate to the layers of the OSI model? (5 mark)
   b. Describe the functions of the 'Physical Layer' in the OSI model. (10 mark)
   c. What are the importances of the layers of OSI model to the network administrator? (5 mark)

4.
   a. How does a single-bit error differ from a burst error? (4 mark)
   b. What is the difference between forward error correction and backward error correction in data transmission? (6 mark)
   c. Sender transmits a codeword as 1010010. At the receiving end, receiver got the message as 1010011. State the position of the error using Hamming Code (7, 4). (10 mark)

5.
   a. Why does congestion occur within a packet-switched network? (6 mark)
   b. Name the policies that can prevent congestion in open loop congestion control technique. (6 mark)
   c. Briefly describe the 'Leaky Bucket Algorithm' in open loop congestion control. (8 mark)

6. Write short notes for the following topics.
   a. IPv4 Addresses
   b. Network topologies
   c. Unguided transmission Media
   d. Stop and Wait protocol

(4 x 5 mark)