THE OPEN UNIVERSITY OF SRI LANKA
B.Sc. DEGREE PROGRAMME: LEVEL 05
NO BOOK TEST 1 - 2016/2017
CPU3245 – COMPUTER NETWORKS AND SECURITY
DURATION: One and Half hours

Date: 22/09/2017 **Time: 4.00pm – 5.30pm**

Answer All Questions

QUESTION 1

1.1) What is a *node* in a computer network? Describe the network topologies *bus*, *star* and *mesh* using appropriate diagrams.

1.2) Compare the operations of a network router and a network switch.

1.3) Briefly describe 10base5, 100baseT and 1000baseLX cabling standards.

1.4) Describe *cut-through* and *fragment free* switching techniques in a network switch.

1.5) Give the color code of *transmit* +, *transmit* -, *receive* + and *receive* – wires in the 568B UTP network cabling standard.

QUESTION 2

2.1) List the names given for data fragments in *transport layer*, *network layer* and *data link layer* in the OSI model.

2.2) Describe operation of a simplex protocol in a noisy channel.

2.3) Compare the functionality of the 1-persistent and the 0.5-persistent CSMA protocol. Which of the above two protocols has the best throughput?

2.4) A channel has erroneous data of 16 kilo bytes per every 2 mega bytes of data sent over the channel which needs to be retransmitted. Transmission overhead of each 64 kilo bytes of data is 4 kilo bytes. A file of 300 Mega bytes is copied over the channel.

(i) Calculate the amount of erroneous data, which needs to be retransmitted.

(ii) Calculate the total amount of transmitted data with overhead in the file copying operation.

QUESTION 3

3.1) Draw IP header and briefly describe each attribute of the IP header

3.2) Describe features of the *adaptive* and *non adaptive* routing algorithms

3.2) IP of a PC in a network is given as 10.172.43.20/25. Calculate the network address, broadcast address and the last PC address of the above network.