

COMP90007 Internet Technologies

Semester 2, 2018

Assignment 2

Due date: 5:00pm, 04/09/2018

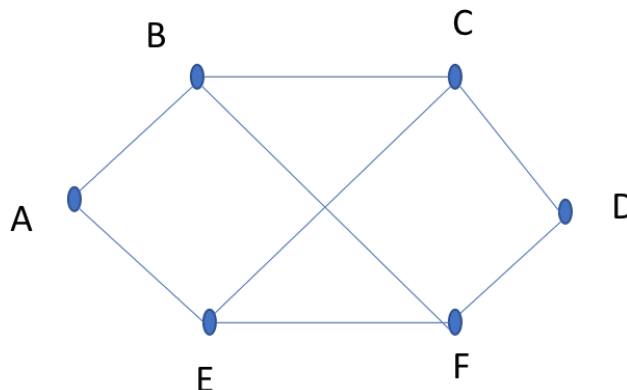
This assignment is worth 5% of the total marks for the subject. This assignment has 5 questions. The weighting of each question is shown beside the Question. Answers must be submitted as a PDF file via the COMP90007 Assignment 2 submission form in the LMS by **5:00pm, 04/09/2018**. Late submissions will attract a penalty of 10% per day (or part thereof). Please ensure your name and user name are clearly presented. Submission should only contain the question number and the answer (*do not repeat the text of questions in your submission*). Please present all steps for questions involving calculations and/or derivations otherwise relevant penalties will be imposed.

Each question can be answered in a few sentences. Excessively long answers will be penalized.

All questions can be answered by studying the material from the textbook. You can discuss the assignment topics with your friends, however, all work presented should be your original work. There will be a discussion forum thread for the assignment and any instructions provided in the forum are also part of the specification.

Question 1 (1 mark)

Consider the subnet of the following figure. Distance vector routing is used, and the following vectors have just come in to router C: From B: (5,0,9,11,7,4); From D: (15,13,7,0,8,4); and From E: (8,5,4,9,0,6). The measured delays to B,D,E are 5, 4, and 3 respectively. What is C's new routing table? Give both the outgoing line to use and the expected delay. Also, show the vectors for B, D, and E.



Question 2 (1.5 mark)

- a. If a class B network uses a subnet mask 255.255.240.0, how many subnets are allowed?
- b. A large number of consecutive IP addresses are available starting at 128.16.0.0. Suppose that four organizations A,B,C and D request 2000, 1000, 2000, and 4000 addresses respectively, and *in that order*. For each of these, use the table below to give the first IP address assigned, the last IP address assigned, and the mask in the **w. x. y. z /s notation** and not /s. Include all 0's and all 1's in your allocation.

Organisation	Starting Add	Ending Add	Adds allocated	Mask
A				
B				
C				
D				

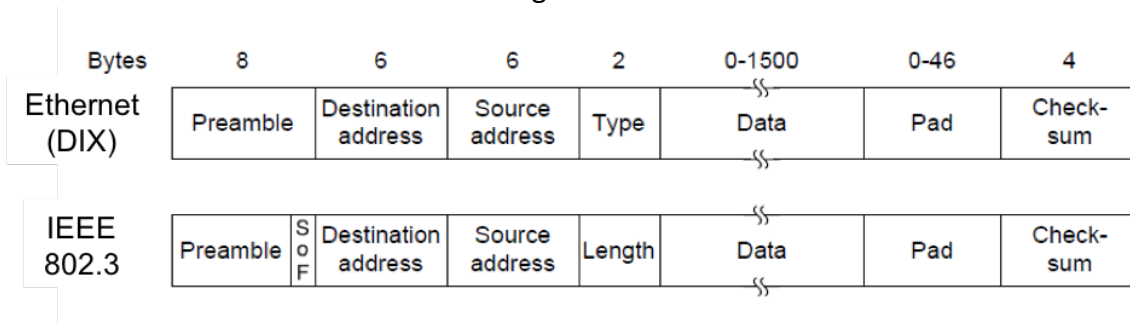
Question 3 (0.5 mark)

In the wireless LAN shown below, station C wants to transmit to station B. Note that all 4 stations lie in a straight line. If C does not detect any collision, does this mean that station B has successfully received the transmission? Briefly justify your answer, assuming that background noise is negligible.

A B C D

Question 4 (1 mark)

Refer to the Ethernet frame format in the figure below



- a. Explain the rationale behind the use of padding in classic Ethernet frame structure?
- b. An IP packet to be transmitted by Ethernet is 62 bytes long, including all its headers. If LLC is not in use, is padding needed in the Ethernet frame, and if so, how many bytes? Briefly justify your answer.

Question 5 (1 mark)

This question is about Limited-Contention Protocols.

There are sixteen stations, numbered 1 through 16, contending for the use of a shared channel by using the *adaptive tree walk protocol*. If the stations with addresses 1; 5; 8; 10; 11; 15 suddenly became ready at once, how many bit slots are needed to resolve the contention?