**Computer Networks (IT210)**

**Assignment 3**

**Due Date: 11 December, 2016 Total Marks = 4**

**Important Instructions:**

1. Read and understand the questions carefully.

2. Take your assignment as an opportunity to raise your understanding for the course materials; work on it during the whole allowed period to provide original answers, do not wait for one day before the deadline to work on your assignment

3. This is an individual work, so make sure it is your own.

4. Search the textbook or other resources to have a better understanding of the questions.

5. Use ‘Word Processor’ to answer the questions, do not include text as image.

6. Submission must be through Blackboard only, no email submissions will be accepted.

7. Plagiarism will result in “0” mark.

**(2 Marks) Question 1:** An ISP has a block of addresses with the starting address 117.5.12.0**/**24. This ISP has to assign IP addresses to four small ISPs in subblocks such as:

1. one subblock of 65 addresses,
2. one subblock of 64addresses,
3. one subblock of 12 addresses and
4. one subblock of 5 addresses

Provide the first and last IP addresses for each of the above subblock. Briefly explain each of your answer. Note that each IP address you mention should contain the “Prefix” and the “Suffix” parts.

Answer:

a) The number of addresses in the largest subblock, which requires 65 addresses, is not a power of 2. We allocate 128 addresses. The subnet mask for this subnet can be found as *n*1 = 32 − log2 128 = 7.

* The first address in this block is 117.5.12.0**/25**;
* The last address is 117.5.12.127**/25**.

**b)** The number of addresses in the second largest subblock, which requires 64 addresses, is a power of 2. We allocate 64 addresses. The subnet mask for this subnet can be found as *n*2 = 32 − log2 64 = 6.

* The first address in this block is 117.5.12.128**/26**;
* The last address is 117.5.12.191**/26**.

**c)** The number of addresses in the third subblock, which requires 12 addresses, which is not a power of 2. We allocate 16 addresses. The subnet mask for this subnet can be found as *n*1 = 32 − log2 16 = 4.

* The first address in this block is 117.5.12.192**/28**;
* The last address is 117.5.12.207**/28**.

**d)** The number of addresses in the smallest subblock, which requires 5 addresses, is not a power of 2. We allocate 8 addresses. The subnet mask for this subnet can be found as *n*1 = 32 − log2 8 = 3.

* The first address in this block is 117.5.12.208**/29**;
* The last address is 117.5.12.215**/29**.

**(1 Mark) Question 2:**

1. What is the purpose of the ICMPv4 protocol and mobile IP?

ICMPv4 is added to provide error-reporting/correcting mechanisms at the network layer because IPv4 protocol has no such features.

Mobile IP allows computers to connect to the Internet at any location while making the movement of a computer transparent to the rest.

1. Differentiate the terms Delay and Throughput?

Answer: The delays in a network can be divided into four types: transmission delay, propagation delay, processing delay, and queuing delay.

Throughput at any point in a network is defined as the number of bits passing through the point in a second, which is actually the transmission rate of data at that point. In a path from source to destination, a packet may pass through several links (networks), each with a different transmission rate.

**(1 Mark) Question 3:** What is double crossing (an issue related to mobile IP)? Explain in your own words. Also, draw a Figure to elaborate.

Answer:

A problem that happens when the remote host and the mobile host are on the same network.

