GIFT UNIVERSITY

GUJRANWALA

(Chartered by the Govt. of the Punjab, Recognized by HEC)

EXA-1

Department of Computer Science

Data Communication & Computer Networks (CS - 308)
Computer and Communication Networks (CS-225)

Final Term Examination
Spring 2016

Dr. Muhammad Hasanain Chaudary

Time: 180 Minutes **Total Marks: 100**

Candidate Name: _____ **Candidate Roll No:** 1413

Instructions to Candidates:

- Candidates are required to sit on the seats assigned to them by the invigilators.
- Do not open this question paper until you have been told to do so by the invigilator.
- Please fill in exam specific details in space provided (both Question Paper and Answer Sheet).
- This is a Closed Book Exam. "Closed book examinations" refer to examinations where the candida may not take into the examination room any study materials (including textbooks, study guide lecture notes, printed notes from web pages, hand written notes and any audio/visual aid).
- **There are 6 questions. Attempt all questions.**
- Do not write anything on question paper except Name and Roll Number.

1. **Answer following short questions:** [35]

   a. Suppose that a TCP congestion window is set to 18 KB and a timeout occurs. How big will the window be if next four transmission bursts are all successful? Assume the maximum segment size is 1 KB. (5)

   b. What is Silly Window Syndrome? Explain different algorithms that can be used to avoid the problem of silly window syndrome (5)

   c. Consider a situation in which a cyber terrorist makes all the DNS servers in the world crash simultaneously. How does this change one's ability to use the Internet? (5)

   d. Many companies have a policy of having two (or more) routers connecting the company to the Internet to provide some redundancy in case one of them goes down. Is this policy still possible with NAT? Explain your answer. (5)

   e. Why FTP uses two separate connections? Why FTP generates "out of band" message in control connection? (5)

   f. Explain the difference between *non-persistent HTTP* and *persistent HTTP* connections. (5)

   g. Write down the differences of CSMA/CD in comparison to ALOHA. (5)

2. **Using the concept of hamming code (error correction code) encode the following 14 bit sequence, and after encoding assume a single bit error at any location and then apply the decoding process as well.** [15]

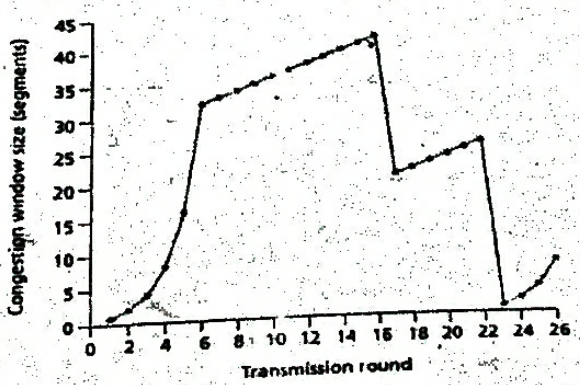
   14 bit sequence = 11000011110101

3. **Consider sending a 8000-byte datagram into a link that has an MTU of 500 bytes. Suppose the original datagram has the identification number 512. Answer following questions** [10]

   a. How many segments are generated? (5)

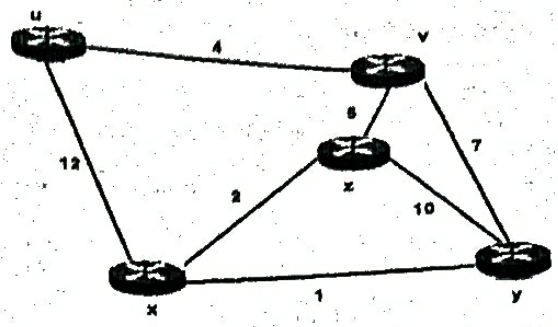
   b. What are the values of Identification, DF, MF and fragment offset fields? (5)

4. **Assuming TCP Reno is the protocol experiencing congestion as shown in the figure given below, answer the following questions. In all cases, you should provide a short discussion justifying your answer.** [15]



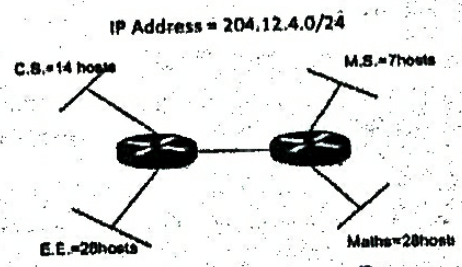
a. Identify the intervals of time when TCP slow start is operating. (3)
b. Identify the intervals of time when TCP congestion avoidance is operating. (3)
c. After the 16th transmission round, is segment loss detected by a triple duplicate ACK or by a timeout? (3)
d. After the 22nd transmission round, is segment loss detected by a triple duplicate ACK or by a timeout? (3)
e. What is the initial value of *ssthresh* at the first transmission round? (3)

5. Consider the network shown below: **[10]**



By using the concept of Dijkstra's algorithm write down the forwarding table for the node "y".

6. Use Variable-Length Subnet Masking (VLSM) to develop a subnetting scheme for the network scenario given below. **[15]**



a) Identify the total number of required subnets? (2)
b) What is the subnet mask of each subnet? (3)
c) List down the Subnet IDs and host address range of all the subnets. (5)