Exam:	Midterm	**Instructor:**	Dr. Faisal Bashir
Type of Paper:	Regular	**Total Marks:**	30
Semester:	Fall	**Time Allowed:**	90 mins

Instructions:
1. Attempt all questions
2. Write your Index # on question paper and answer book.
3. Please write neatly and number questions and subparts carefully.
4. If a question is unclear, state your assumptions and answer the problem based on your assumptions.
5. Understanding the question is also a part of the examination.

Q1. Consider a scenario, where "ABC limited" runs its own DNS servers for the "abclimited.com" zone. The master name server is called "ns1.abclimited.com", and the slave is "ns2.abclimited.com". Our DNS servers accept recursive requests from machines within our company, but will ***not*** assume other machines will accept such request. Both the server and resolver perform caching, and the caches are initially empty. For this scenario answer the following: **[2+2+2]**

   a. Suppose a user from ABC limited tries to access www.mcs.nust.edu.pk. In this case draw a complete flow diagram indicating all the intermediate DNS servers involved for the name resolution of www.mcs.nust.edu.pk.

   b. List all the DNS queries sent and received by intermediate DNS servers. You can make assumption regarding names and IP addresses of the intermediate servers.

   c. Again draw the flow diagram BUT with an assumption that all DNS servers apart from root server support recursive quires.

Q2. The RRT between a source and destination is 0.3 seconds. A user access a web page comprising of 20 objects and the transmit time for each object is 0.2 ms. Find the total delay involved from sending a request and receiving the complete page for the following HTTP connections: **[1+1+1]**

   a. Non persistent HTTP connection
   b. Persistent HTTP connection without pipelining
   c. Persistent HTTP connection with pipelining

Q3. Explain the working and advantage of conditional GET request of HTTP. **[2+1]**

Q4. Suppose a client system (192.168.14.10) protected by a firewall wants to download a file from a FTP server (112.23.14.5). For this scenario, draw a flow indicating connection establishment and data transfer of FTP. **[3]**

Q5. Each layer in the OSI Model provides a service, service interface and protocol (peer interface). In this regard explain the services, interface and protocol of transport layer. **[3]**

Q6. For each of the following network conditions and traffics, specify whether circuit or packet switching is better and give reasons. **[2+2]**

a. Frequent link failures

b. Video traffic

Q7. You have a network ID of 206.17.250.0 and need to divide it into nine subnets. You are required to provide the largest possible number of hosts per subnet. For this network provide the following: **[2+2+1+1]**

a. Subnet mask of the network

b. All subnet IDs

c. Broadcast Address of Third subnet

d. First valid IP address of fifth subnet

Q8. Suppose two hosts, A and B, are separated by 10000 kilometers and are connected by a direct link with bandwidth 1 Mbps. Suppose the propagation speed over the link is 2.5×10^8 meters/sec. Consider sending a 1 MB file continuously as one big message from A to B. What is the transmission delay? What is the propagation delay? **[1+1]**