**CS 3800 Computer Networks**

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**Quiz # 2  
(Solutions in red)**

**Duration: 15 minutes**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Consider the delay to transfer six web objects between a web client and a web server. Let τ be the round trip time(i.e., 2 times the propagation delay) between the client and the server, di be the transmission time of the object *i.* **Ignore the delay of TCP control messages , transmission delay of HTTP request messages, all queueing delays and all processing delays.**
   1. What is the total delay to transfer the objects using Non-persistent HTTP with no parallel connections?

**Non persistent HTTP**

Delay for 1 object = TCP connection +HTTP request +HTTP response +Transmission delay

= τ + 1/2 τ + 1/2 τ + di

= 2τ + di

Hence , delay for **6** objects = 6(2τ + di) = **12τ +**

* 1. What is the delay using persistent HTTP with no parallelism?

**Persistent HTTP**

Delay to establish TCP connection = τ

Delay for 1 object = HTTP request +HTTP response +Transmission delay

= 1/2 τ + 1/2 τ + di

= τ + di

Delay for 6 objects = 6τ +

**Hence Total Delay =** τ + (6τ + ) = **7τ +**

1. For each of the following protocol layers (Application, Transport, Network and Link) which of the following responsibilities **can** fall under their domain? A particular responsibility may fall under the domain of more than one layer.
   1. Congestion control

Ans: Transport Layer

* 1. Transmission channel sharing mechanism

Ans: Link Layer

* 1. Packet forwarding along shortest path from source to destination

Ans: Network Layer

1. a. Which layers in the Internet protocol stack does a router process?

Ans: Network, link and physical layers

1. Which layers does a link-layer switch process?

Ans: Link and physical layer

1. Which layers does a host process?

Ans: Application, Transport, Network, Link, Physical Layers