Indian Institute of Information Technology, Sri City, Chittoor

QP-SET-6

Course: Computer and Communication Networks (CCN)

Duration: 60 mins Max. Marks: 30 Marks

Instructions:

1. Closed book exam
2. Must turn on video and mic throughout the exam. Please keep enough A4 sheets to write answers. **Each A4 should have QP-SET-No, Your Name, Roll number and page number on the top right corner.**
3. Charge your laptops and mobiles ahead of exam to avoid issues during the exam. Suggested to keep alternate mobile phones in case of network issues
4. Total Exam session will be recorded.
5. Each student should start scanning the answer scripts in the order from 4:00 PM and should submit before 4:15 PM as a single pdf document through the shared google classroom link.
6. Assumptions made should be clearly stated and All sub-parts of the question should be written together
7. Naming Convention for the Answer script to upload in the google classroom is **Set-Number-Rollnumber.pdf**

Section-1:

A. Suppose users share a 3 Mbps link. Also suppose each user transmits continuously at 1.5 Mbps when transmitting, but each user transmits only 20 percent of the time..

i. When circuit switching is used, how many users can be supported? **(1M)**

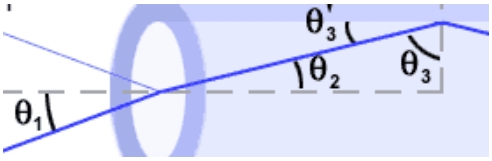
ii. For the remainder of this problem, suppose packet switching is used. Why will there be essentially no queuing delay before the link if two or fewer users transmit at the same time? Why will there be a queuing delay if three users transmit at the same time? **(1M)**

iii. Suppose now there are three users. Find the probability that at any given time, all three users are transmitting simultaneously. Find the fraction of time during which the queue grows. **(3M)**

B. The index of refraction of the inner core is 1.480 , and the index of refraction of the outer cladding is 1.44. **(3M)**

i. What is the critical angle for the core-cladding interface?

ii. For what range of angles in the core at the entrance of the fiber (θ2) will the light be completely internally reflected at the core-cladding interface?



C. Processing delay is the time taken to transmit all the bits of the packet into the link and it is fixed **(1M)**

a. True

b. False

D. Fiber optic cables are the not much secure for data transmission. (**1M)**

a. True

b. False

Section-2:

A. Four channels , two with a bit rate of 450kbps and two with a bit rate 250 kbps are to be multiplexed using multiple slots TDM with no synchronization bits. Answer the following questions: assume 8 bits from the first 2 sources and 6 bits from the second 2 sources.

i. What is the date rate?

ii. What is the size of a frame in bits? **(4M)**

B. How long it takes to send a file of 300,000 byte from Host A to Host Bover a circuit-switched network. Suppose that all links in the network use TDM with 14 slots and have a bit rate of 3.6 Mbps. Also suppose that it takes 10 msec to establish an end-to-end circuit before Host A can begin to transmit the file **(4M)**

C. HTTP response messages never have an empty message body.

a. True

b. False (**1M)**

D. In UDP, the service includes guaranteed delivery of application-layer messages to the destination and flow control.

a. True

b. False (**1M)**

Section-3:

A. Explain the Hierarchy of DNS servers with near diagram. **(5)**

B. Distinguish between SMTP over IMAP **(3)**

C. Suppose within your Web browser you click on a link to obtain Web page (HTML) file. A Web page HTML file references nine objects on the same server. The round trip time is 18s and Neglecting transmission time of the file, how much time elapses with

i. Non-persistent HTTP with no parallel TCP connections to access referenced objects?

ii. Persistent HTTP to access referenced objects? **(2)**

---------- All the best ----------