# Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India

(Autonomous College Affiliated to University of Mumbai)

## End Semester Examination

Nov 2017

**Max.Marks: 100** | **Duration: 3Hrs**

**Class: B.E.** | **Semester: VII**

**Course Code: EXC704** | **Branch: ETRX**

**Name of the Course: Computer Communication and Networks**

**Instruction:**

(1) All questions are compulsory

(2) Draw neat diagrams wherever required

(3) Assume suitable data if necessary

(3) CO – Course Outcomes

| Q No. | | Max. Marks | CO |
|---|---|---|---|
| Q.1 ( a) | What is Multiplexing? Compare TDM and FDM. Five channels, each with a 100-kHz bandwidth, are to be multiplexed together. What is the minimum bandwidth of the link if there is a need for a guard band of 10kHz between the channels to prevent interference?. | 10 | CO1 |
| Q.1 ( b) | What is Synchronous Transmission? Discuss the problem of transparency in HDLC protocol. List and discuss any two common methods of error detection adopted by data link layer. | 10 | CO2 |
| | **OR** | | |
| Q.1 ( b) | Discuss data link layer protocols for noiseless (error-free) channels and those that can be used for noisy (error-creating) channels. | 10 | CO2 |
| Q.2 ( a) | What is NAT? Discuss STUN protocol used by NAT and the problems associated. | 05 | CO3 |
| Q.2 ( b) | 1) A telephone line normally has a bandwidth of 3000 Hz (300 to 3300 Hz) assigned for data communications. The signal-to-noise ratio is usually 3162. Calculate the channel capacity C and comment. 2) Now consider an extremely noisy channel in which the value of the signal-to-noise ratio is almost zero. In other words, the noise is so strong that the signal is faint. Find channel capacity 'C' and comment. | 05 | CO1 |
| | **OR** | | |
| Q.2 ( b) | We have four sources, each creating 250 characters per second. If the interleaved unit is a character and 1 synchronizing bit is added to each frame, find (a) the data rate of each source, (b) the duration of each character in each source (c) the frame rate (d) the duration of each frame, (e) the number of bits in each frame. | 05 | CO1 |
| Q.2 ( c) | Compare GEO, MEO and LEO. Prove mathematically that the visibility of Geosynchronous Orbiting Satellite is 24Hrs. | 10 | CO1 |
| | **OR** | | |

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|---|---|---|---|
| Q.2 ( c) | What is ALOHA? Compare Pure ALOHA and Slotted ALOHA. A pure ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces a.) 1000 frames per second b.) 500 frames per second. | 10 | CO1 |
| Q.3 (a) | Define Error control and Flow control. Compare and contrast byte-stuffing and bit-stuffing. | 05 | CO2 |
| Q.3 (b) | Discuss exposed and hidden node terminal problems in wireless networks. | 05 | CO1 |
| Q.3 (c) | What are the factors that causes congestion? Discuss Warning bit,piggy-backing and choke packets used by transport layer. | 10 | CO4 |
| | **OR** | | |
| Q.3 (c) | What is QoS? Define the flow characteristics for QoS. Also discuss any 2 scheduling techniques used for QoS improvements. | 10 | CO4 |
| Q.4 (a) | Draw and explain frame format of IEEE802.3. | 05 | CO2 |
| | **OR** | | |
| Q.4 (a) | Draw and explain frame format of Point to Point protocol. | 05 | CO2 |
| Q.4 (b) | Discuss Max-Min fairness algorithm with example. | 05 | CO4 |
| Q.4 (c) | Explain how Subnet Mask Works? Assume IP Address :192.168.1.1 Now Assume that the administrators requirement is 40 hosts and is using Class C network-id address : 192.168.1.0. Using the concept of Subnetting find the possible host/subnets and subnet ranges. | 10 | CO3 |
| Q.5 (a) | What are major components of Electronic Mail? Discuss in brief. | 10 | CO5 |
| | **OR** | | |
| Q.5 (a) | What are cookies and cache? Discuss in brief about Domain Name Server. | 10 | CO5 |
| Q.5 (b) | Compare Connection Oriented and Connection-less protocols. Also discuss the working of FTP. | 05 | CO5 |
| Q.5 (c) | Compare Leaky Bucket algorithm with Token Bucket algorithm. | 05 | CO4 |

————Best of Luck————