

## DATA COMMUNICATION AND NETWORKS

Paper Code: ETEC-421

Paper: Data Communication and Networks

<b>L</b>	<b>T/P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>4</b>

### **INSTRUCTIONS TO PAPER SETTERS:**

**MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

*Objectives: The objective of the paper is to provide an introduction to the fundamental concepts on data communication and the design, deployment, and management of computer networks.*

### **UNIT- I**

**Data Communications :** Components, protocols and standards, Network and Protocol Architecture, Reference Model ISO-OSI, TCP/IP-Overview ,topology, transmission mode, digital signals, digital to digital encoding, digital data transmission, DTE-DCE interface, interface standards, modems, cable modem, transmission media-guided and unguided, transmission impairment, Performance, wavelength and Shannon capacity. Review of Error Detection and Correction codes.

**Switching:** Circuit switching (space-division, time division and space-time division), packet switching (virtual circuit and Datagram approach), message switching.

**[T1, T2, R1, R4] [No. of Hours: 11]**

### **UNIT- II**

**Data Link Layer:** Design issues, Data Link Control and Protocols: Flow and Error Control, Stop-and-wait ARQ. Sliding window protocol, Go-Back-N ARQ, Selective Repeat ARQ, HDLC, Point-to –Point Access: PPP Point –to- Point Protocol, PPP Stack,

**Medium Access Sub layer:** Channel allocation problem, Controlled Access, Channelization, multiple access protocols, IEEE standard 802.3 and 802.11 for LANS and WLAN, high-speed LANs, Token ring, Token Bus, FDDI based LAN, Network Devices-repeaters, hubs, switches bridges.

**[T1, T2, R1][No. of Hours: 12]**

### **UNIT- III**

**Network Layer:** Design issues, Routing algorithms, Congestion control algorithms,

Host to Host Delivery: Internetworking, addressing and routing, IP addressing (class full and Classless), Subnet, Network Layer Protocols: ARP, IPV4, ICMP, IPV6 ad ICMPV6.

**[T1, T2, R1][No. of Hours: 11]**

### **UNIT- IV**

**Transport Layer:** Process to Process Delivery: UDP; TCP, congestion control and Quality of service.

**Application Layer:** Client Server Model, Socket Interface, Domain Name System (DNS): Electronic Mail (SMTP), file transfer (FTP), HTTP and WWW.

**[T2, T1, R1, R4][No. of Hours: 10]**

### **Text Books:**

[T1] A. S. Tannenbum, D. Wetherall, “Computer Networks”, Prentice Hall, Pearson, 5<sup>th</sup> Ed

[T2] Behrouz A. Forouzan, “Data Communications and Networking”, Tata McGraw-Hill, 4<sup>th</sup> Ed

### **Reference Books:**

[R1] Fred Halsall, “Computer Networks”, Addison – Wesley Pub. Co. 1996.

[R2] Larry L, Peterson and Bruce S. Davie, “Computer Networks: A system Approach”, Elsevier, 4<sup>th</sup> Ed

[R3] Tomasi, “Introduction To Data Communications and Networking”, Pearson 7<sup>th</sup> impression 2011

[R4] William Stallings, “Data and Computer Communications”, Prentice Hall, Imprint of Pearson, 9<sup>th</sup> Ed.

[R5] Zheng , “Network for Computer Scientists and Engineers”, Oxford University Press

[R6] Data Communications and Networking: White, Cengage Learning