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M. Tech 1st Semester Examination

Design of Data Communication Networks

EC-103

Time : 3 Hours   **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note :   Do any five questions. All question carry equal marks. Please be brief and precise.

1. (a)   Compare relative merits and de-merits of transmission media on the basis of network performance metrics. **(10)**

    (b)   List the various services being provided by Data Link Layer. How does flow control is managed by DLL? Support your answer with suitable example.   **(10)**

2. (a)   Discuss differences between the Asynchronous and Synchronous Data Transmission. Explain the Transmission efficiency matrix for both these approaches for various data rates.   **(10)**

    (b)   List the advantages of Packet switched Networks over Circuit as well as message switched networks. Why is it mandatory for the data networks to be Packet switched Networks?   **(10)**

3. (a)   Compare OSI and TCP/IP model critically and list relative advantages and disadvantages of both models.   **(10)**

    (b)   Most common Local Area Network access methods are "Contention" methods. Do you agree with statement, please comment? How Random Backoff scheme improves the efficiency in Ethernet networks?   **(10)**

4. (a) What do you understand by term "Internetworking"? List various Hardware components used for Internetworking. Explain significance of NIC and Gateway in modern data communication. **(10)**

    (b) Discuss classes of IP Addressing. Explain the difficulties involved while implementing transition of IPv4 format to IPv6 format. **(10)**

5. List the various functions performed by presentation Layer. Explain Encryption. List the various methods of data Encryption. Explain one encryption method along with algorithm. **(20)**

6. What do you mean by the term "Network Operating Systems"? List the important features of Unix operating system. Would you prefer to use Unix or Linux as network operating system? **(20)**

7. (a) Discuss the various network attacks along with security issues while handling Data Networks. **(10)**

    (b) "Firewalls are vital saviours for any business establishment" comment on the statement. Explain Packet filtering principle and its implementation. **(10)**

8. Write short notes on the following:

    (a) Transport Layer Protocols.

    (b) Non-Adaptive vs. Adaptive Routing Protocols.

    (c) Bit oriented vs. Character oriented protocols.

    (d) Physical Interfaces & Service Access Points (SAP).
                                                    (4×5=20)