[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
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B. Tech 5th Semester Examination

Computer Networks (O.S.)

IT-5003

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 : Attempt five questions in all selecting one from each of the Sections A, B, C & D. Section E is compulsory.

SECTION - A

1. (a) List seven layers of OSI model. What are the principles that were applied to arrive at the seven layers in OSI model? **(7½)**

   (b) A binary signal is sent over a 3KHz channel whose signal-to-noise ratio is 20 dB. Calculate the maximum achievable data rate. **(7½)**

2. (a) What do you understand by the term structured cabling? State the main rules that should be used when installing a cable. **(7½)**

   (b) What are error detecting and correcting codes? What is the utility of Hamming distance in error detection and correction? Explain with a suitable example. **(7½)**

SECTION - B

3. (a) Explain the working of 3-bit sliding window protocol with suitable example. **(7½)**

(b) Explain the Selective Repeat ARQ techniques in detail. **(7½)**

4. (a) Define FDDI protocol. How does it offer higher reliability than token ring protocol? **(7½)**

(b) What do you mean by protocol verification? How will you verify a protocol using finite state machine? **(7½)**

SECTION - C

5. (a) What are the various classes of IP addressing? Calculate the maximum number of class A, B and C Network IDs. **(7½)**

(b) Explain leaky bucket algorithm and compare it with token bucket algorithm. **(7½)**

6. (a) What are the functions of a transport layer? What type of information must be contained in the transport header of the transport layer? Explain. **(7½)**

(b) Explain why TCP does not use a two-way handshake. What extra functionality is gained in a three-way handshake that is not possible with a two-way handshake? **(7½)**

SECTION - D

7. (a) What is the role of session layer in OSI model? How is it being handled in TCP/IP model? **(7½)**

(b) What is encryption? What is a public and private key? What are the main strategies to provide the security to a network system? **(7½)**

8. (a) Illustrate with a figure how a man-in-middle attack can compromise a Diffie-Hellman key exchange. **(7½)**

(b) Define electronic mail. List various security threats for electronic mail. **(7½)**

SECTION - E

9. (a) Differentiate between static and dynamic channel allocation.

(b) Why is a network switch preferred over a hub?

(c) Convert the IP address 172.16.27.234 into binary ?

(d) Explain the difference in how forwarding is done in circuit- and packet-switched networks respectively.

(e) How does distance-vector routing algorithms differ from link-state routing algorithms in terms of how often, and to whom, routing updates are transmitted from a node?

(f) What is the difference between a LAN and a WAN?

(g) Explain the function of repeater and bridge.

(h) Explain the operation of CRC error detection method.

(i) What is the difference between intranet and extranet?

(j) Write a note on SNMP. **(10×4=40)**