(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1036 Roll No. | | | | | | | | | | |

B.Tech.

SIXTH SEMESTER EXAMINATION, 2004-2005

COMPUTER NETWORKS

Time : 3 Hours *Total Marks : 100*

Note : *(i) Attempt **ALL** the questions.*

(ii) All questions carry equal marks.

(iii) In case of numerical problems assume data wherever not provided.

1. Attempt ***any four*** parts of the following : **(5x4=20)**

(a) What are the different types of transmission technology ? Explain different types of networks on the basis of transmission technology.

(b) Distinguish between TCP/IP and OSI reference models. Which model is more popular and why ?

(c) Define topology and explain the advantages and disadvantages of Bus, Star and Ring topologies.

(d) An image has the size of 1024 × 786 pixel with 256 colors. Assume the image is uncompressed. How does it take over a 56 kbps modem channel ?

(e) Explain the functions of :

(i) Repeater

(ii) Hub

(iii) Bridge

(iv) Modem

(v) Router

(f) Discuss DQDB standard in context to MAN.

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2. Attempt *any four* parts of the following : **(5x4=20)**

(a) Television channels are 6 MHz wide. How many bits can be sent, if four level digital signals are used ? Assume a noiseless channel.

(b) Calculate CRC for a 10-bit sequence 1010011110. The generator polynomial is $x^3 + x + 1$.

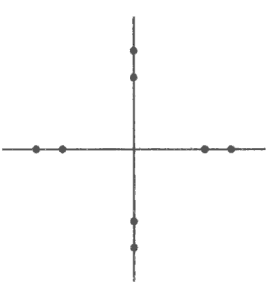
(c) Briefly explain the sliding window protocols.

(d) A LAN uses Mok and Ward's version of binary count down. At a certain instant, ten stations have the virtual station numbers 8, 2, 4, 5, 1, 7, 3, 6, 9 and 0. The next three stations to send are 4, 3 and 9 in that order. What are the new virtual station numbers after all three have finished their transmissions ?

(e) (i) Sketch the Menchester and differential Menchester encoding for the bit stream :

0001110101.

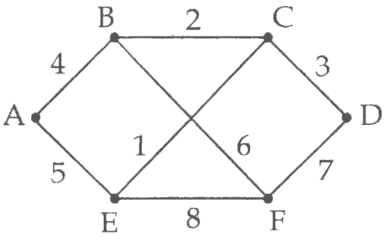
(ii) What is constellation pattern ? Derive the relationship between the bit rate and band rate for the following constellation pattern :



(f) Discuss different carrier sense protocols. How are they different than collision-free protocols ?

3. Attempt *any four* parts of the following : **(5x4=20)**

(a)



For above subnet, if Distance vector routing is used and the following vectors have just come in to router C : from B : (5, 0, 8, 12, 6, 2); from D : (16, 12, 6, 0, 9, 10); from E : (7, 6, 3, 9, 0, 4). The measured delays to B, D, E are 6, 3, 5 respectively. What is C's new routing table ? Give both the outgoing line to use and the expected delay.

(b) Differentiate between :

(i) Virtual circuit subnet and datagram subnet

(ii) ARP and RARP

(c) What is congestion ? Discuss Leaky bucket algorithm.

(d) An ATM network, uses a token bucket scheme for traffic shaping. A new token is put into bucket every 5 μ sec. What is the maximum sustainable net data rate (excluding header bits) ?

(e) (i) Convert the IP address whose hexadecimal representation is C22F15B2 to dotted decimal notation.

(ii) A class B network on the internet has a subnet mask of 255.255.240.0. What is the maximum number of hosts per subnet ?

(f) What is fragmentation ? Compare and contrast transparent and non-transparent fragmentations.

4. Attempt *any two* parts of the following : **(10x2=20)**

(a) What are the problems encountered during releasing a connection in transport layer ? Give some solution applicable to it.

(b) Write algorithm of RSA encryption. Using the RSA public key cryptosystem, with a = 1, b = 2 etc and p = 5, q = 11, d = 27, find e ?

(c) Write a short note on three-way handshake. Discuss different QoS (Quality of Service) parameters of Transport layer.

5. Attempt *any two* parts of the following : **(10x2=20)**

(a) What is the need of Data compression in multimedia? Explain different steps of JPEG compression.

(b) (i) Explain DNS addressing scheme.

(ii) Explain the two mail access protocols in brief :

(a) POP3

(b) IMAP

(c) (i) Explain the working of PGP.

(ii) What are the different frame types used in MPEG ? Discuss in brief.

(iii) Differentiate between source and entropy encoding with suitable examples.

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