C 32018 (Pages : 3) Name.....

Reg.No.....

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION JUNE 2007

CS/IT 04 603—COMPUTER NETWORKS

(2004 admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

I. (a) What types of transmission media are used in LANs ? How does a Token Ring LAN operate ?

(b) A message is broken up into three pieces. Discuss the transmission of the packets using the datagram approach to packet switching.

(c) What is the primary difference between N-ISDN and B-ISDN ? In B-ISDN, what is the difference between a distributive service and an interactive service ?

(d) What is the purpose of the CLP bit in the ATM layer header ? Why are the VPI 12 bits for an NNI connection and 8-bits for an UNI connection ?

(e) What is the difference between a simple bridge and a transparent (learning) bridge ? How does a router differ from a bridge ?

(f) What are the *five* main categories of transport layer services ?

(g) What are the advantages of using UDP over TCP ? What is the connection between the TCP/IP Protocol suite and ARPA ?

(h) What are the *three* protocols that interact to manage a network ? How are HTTP and the WWW are related to the Internet ?

(8 × 5 = 40 marks)

II. (a) (i) What is the ratio of useful data to the entire packet for the smallest Token Ring frame ? What is the ratio for the largest frame ? What is the overage ratio ?

(5 marks)

(ii) Why do you think that an Ethernet frame should have a minimum data size ? (3 marks)

(iii) Imagine the length of a 10 Base 5 cable is 2500 meters. If the speed of propagation in a thick coaxial cable is 60 per cent of the speed of light (300,000,000 meters/second) how long does it take for a bit to travel from the beginning to the end of the network ?

(7 marks)

Or

(b) (i) What is the formula to find, in a three-stage crossbar switch the number of cross points (n) in terms of the number of input/output lines (N), the number of first and third stage switches (K) and the number of second-stage switches (L) ?

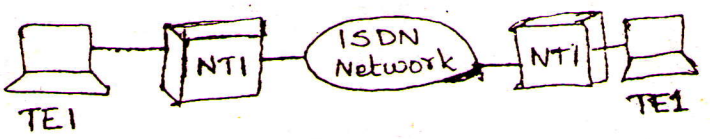
(8 marks)

(ii) Show the sequence of signal frequencies sent when a user dials 864-8902 using a Touch-Tone phone.

(7 marks)

Turn over

III. (a) (i) Two TEs are connected through an ISDN network as shown in figure 1. Show the sequence of D-channel packets exchanged between them (at the network layer) to establish the connection. Where are the ISDN addresses involved ?



(8 marks)

(ii) Does the fact that multiplexing in X.25 is done at the network layer mean two different packets belonging to two different connections can be carried in one frame ?

(7 marks)

Or

(b) (i) The address field of a frame Relay frame is 1011000100010110. Is there any congestion in the forward direction ? Is there any congestion in the backward direction ?

(4 marks)

(ii) An AALI layer receives data at 2 Mbps. How many cells are created per second by the ATM layer ?

(4 marks)

(iii) An AAL2 layer receives data at 2 Mbps. How many cells are created per second by the ATM layer ?

(4 marks)

(iv) In a leaky bucket, what should be the capacity of the bucket if the output rate is 5 gallons per minute and there is an input burst of 100 gallons per minute for 12 seconds and there is no input for 48 seconds ?

(3 marks)

IV. (a) A router using distance vector routing has the following routing table :—

Net 2	6	A
Net 3	4	C
Net 4	3	A
Net 6	2	C
Net 7	3	B

The router receives the following packet from router C :—

Net 2	4
Net 3	5
Net 4	4
Net 6	3
Net 7	2

Show the updated routing table for the router. (15 marks)

Or

(b) (i) Encrypt and decrypt the message "BE" using the RSA algorithm with Key pairs $K_p = 3$ and $K_s = 11$. Use N = 15. (10 marks)

(ii) Given the two prime numbers P = 19 and $q = 23$, try to find N, K_p and K_s. (5 marks)

V (a) (i) Explain about the network layer protocols in TCP/IP model. (10 marks)

(ii) What is the difference between a logical address and a port address ? (5 marks)

Or

(b) (i) Explain the simple mail transfer protocol. (8 marks)

(ii) Explain the Hypertext transfer protocol. (7 marks)

[4 × 15 = 60 marks]