ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2008

DATA COMMUNICATION AND COMPUTER NETWORK

SEMESTER – 2

Time : 3 Hours] [Full Marks : 70

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) Protocols are

a) agreements on how communication components and DTEs are to communicate

b) logical communication channels used for transferring data

c) physical communication channels used for transferring data

d) none of these. ☐

ii) Error detection at the data link level is achieved by.

a) Bit suffering b) Cyclic redundancy codes

c) Hamming codes d) Equalization. ☐

iii) Which of the following is a wrong example of a network layer ?

a) Internet Protocol (IP)-ARPANET

b) X.25 Packet Level Protocol (PLP)-ISO

c) Source routing and domain naming-USENET

d) X.25 level 2-ISO. ☐

iv) How many characters per sec (7 bits + 1 parity) can be transmitted over a 2400 bps line transfer is asynchronous (1 start and 1 stop bit) ?

a) 300 b) 240

c) 250 d) 275. ☐

v) Choose the correct statement :

a) Baseband network uses analog technology

b) Baseband network is Time Division Multiplexed

c) Broadband network uses digital technology

d) In broadband network the carrier signals operate at lower frequency. ☐

vi) The maximum data rate of a channel of 3000 Hz bandwidth and SNR of 30 dB is

a) 15,000 bps b) 60,000 bps

c) 1500 bps d) 3,000 bps. ☐

vii) ICI (interface control information) is

a) used to transfer user data from layer to layer

b) used to exchange information by peer entities at different sites on the network to instruct an entity to perform a service function

c) a combination of service data unit (SDU) and protocol control information (PCI)

d) a temporary parameter passed between N and $N - 1$ layer to involve service function between two layers. ☐

viii) IP address in the B class is given by

a) 125.123.123.2 b) 191.023.21.54

c) 192.128.32.56 d) 10.14.12.34. ☐

ix) Which of the following is not a standard synchronous communication protocol ?

a) SDLC b) SMTP

c) SLIP d) PAS. ☐

x) Repeaters function in

a) Network Layer b) Physical Layer

c) Data Link Layer d) Both (a) and (b).

xi) Flow control is used to prevent

a) overflow of sender buffer

b) overflow of receiver

c) collision between sender & receiver

d) underflow of sender or receiver.

xii) Which is not a basic multiplexing method ?

a) FDM b) TDM

c) WDM d) MDM.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. **Explain** what is the time period of a signal. if there are two sine waves with frequencies of 20 kHz & 40 kHz, what are their time periods ? In general, with the frequency of signal *Y* is double the frequency of signal *X*, how are the time periods of *X* and *Y* are related arithmetically. 1 + 2 + 2

3. A generator function for CRC is given as $x^5 + x^2 + 1$:

a) What is the generator function in binary form ?

b) What is the checksum for the following message in binary and in polynomial form ? 2 + 3

1101011011

4. A system uses the stop-and-wait ARQ protocol. If each packet carries 1000 bits of data, how long does it take to send 1 million bits of data, if the distance between the sender and receiver is 5000 km and the propagation speed is 2×10^8 m ? Ignore transmission, waiting and propagation delay. Assume no data or control frame is lost or damaged. 5

5. What is IP addressing ? What are the different classes of IP addressing ? What is the difference between static and dynamic IPs ? 1 + 2 + 2

6. What is CSMA/CA ? Explain why CSMA/CD cannot be used for wireless LAN. 5

GROUP – C

(Long Answer Type Questions)

Answer any *three* questions. 3 × 15 = 45

7. a) Write in brief the features of the following transmission media :

   i) Co-axial cable ii) Fibre optic cable.

   b) Find out the capacity of a telephone line that transmits frequencies from 300 Hz to 3400 Hz with a signal to noise ratio 35 dB.

   c) What is pulse code modulation ?

   d) What is the equivalent bit rate of PCN channel having bandwidth of 4 kHz.

   8 + 3 + 4

8. a) What is the difference between –

   i) Circuit switching and Packet switching ?

   ii) TDM and FDM ?

   b) What advantages does TCP over UDP ? What are the features for which may TCP be a reliable protocol ?

   c) Explain the functions of repeater, bridge and gateways. 8 + (2 + 2) + 3

9. a) What procedure is used to prevent a stream of binary data from being misinterpreted as an HDLC flag ? Explain the operation of this procedure.

b) Explain crosstalk. How is it reduced ?

c) Why is FSK not suitable for high speed modems ?

d) What is the difference between data-link layer delivery, network layer delivery and transport layer delivery ? 4 + 4 + 3 + 4

10. a) Why is the contention slot of CSMA/CD protocol is 2Y ?

b) How a station can join and leave from a Token Ring LAN ?

c) What is FDDI ?

d) Describe the priority scheme of a Token Bus LAN.

e) What is the function of the preamble field of the 802.3 LAN ?

f) Why is 802.4 called the 'Logical ring' ? 3 + 3 + 2 + 2 + 2 + 3

11. Write short notes on any *three* of the following : 3 × 5

i) UDP

ii) SMTP

iii) X.25

iv) HDLC

v) DNS.

END