



**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 × 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.

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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 × 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

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- 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  $2 \times 10^8$  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

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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.

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END

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