MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : EC-703C

COMPUTER NETWORKS

Time Allotted : 3 Hours | *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

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

i) The network layer concerns with
   a) bits b) frames
   c) packets d) none of these.

ii) Pure ALOHA has a maximum efficiency of
   a) 18% b) 37%
   c) 14% d) none of these.

iii) Which one of the following tasks is not done by data link layer ?
   a) Framing b) Error control
   c) Flow control d) Channel coding.

iv) IPv6 does not use ..... type of address.
   a) Broadcast b) Multicast
   c) any cast d) none of these.

v) The subnet mask 255.255.255.192
   a) extends the network portion to 16 bits
   b) extends the network portion to 26 bits
   c) extends the network portion to 36 bits
   d) has no effect on the network portion of an IP address.

vi) Electronic Mail uses which Application layer protocol ?
   a) SMTP b) HTTP
   c) FTP d) None of these.

vii) UDP is
   a) connection-oriented
   b) connectionless
   c) both (a) and (b)
   d) none of these.

viii) HDLC is a
   a) bit oriented protocol
   b) byte oriented protocol
   c) both (a) and (b)
   d) cannot say.

ix) Token passing is a technique applied in
   a) data link layer b) transport layer
   c) physical layer d) presentation layer.

x) The protocol that maps a physical (MAC) address to the corresponding logical address is
   a) ARP b) RARP
   c) ICMP d) IMAP4.

xi) In a *p*-persistent approach, when a station finds an idle line, it
   a) waits 1s before sending
   b) sends with probability $1 - p$
   c) sends with probability p
   d) sends immediately.

xii) When data and acknowledgement are sent on the same frame, this is called
a) piggy backing
b) back packing
c) piggy packing
d) acknowledgement frame.

GROUP – B
(Short Answer Type Questions)

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

2. a) Mention the differences between packet switching and circuit switching.
b) Explain briefly different circuit switching with examples. 2 + 3

3. What do you mean by the term 'redundancy' ? How is CRC generated from the sender side ? How does a single bit error differ from burst error ? 1 + 2 + 2

4. Distinguish between the following :
a) Pure ALOHA and Slotted ALOHA
b) TCP and UDP. $2\frac{1}{2} + 2\frac{1}{2}$

5. What is the basic difference between Bridge and Hub ? Why is Hub called a multiport Repeater ? 3 + 2

6. What do you mean by classful addressing ? What are the advantages of classless addressing over classful addressing ? 2 + 3

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Compare between OSI and TCP layered models.
b) Prove that $2^r \geq m + r + 1$, where m is the no. of data bits and r is the no. of redundancy bits required to correct the error.
c) How does a single bit error is different from burst error ? 5 + 5 + 5

8. a) State the advantage of IPv6 and IPv4.
b) Explain Link State routing.
c) Differentiate between ARP and RARP. 5 + 5 + 5

9. a) Explain sliding window protocol with examples.
b) Explain with diagram, how the lost frame, delayed and lost acknowledgements are handled in Go-Back-N-ARO.
c) Describe any one guided and one unguided media. 5 + 5 + 5

10. a) What do you mean by private key and public key cryptography ? Why is it used ?
b) Explain briefly RSA algorithm.
c) What do you mean by data privacy ? How can authentication, integrity and non-repudiation be implemented by the digital signature technique ? 4 + 6 + 5

11. Write short notes on any *three* of the following : 3×5
a) LAN, MAN and WAN
b) CSMA/CD
c) Firewall
d) DNS
e) FTP.