WEST BENGAL UNIVERSITY OF TECHNOLOGY

MCA-201

DATA COMMUNICATION & COMPUTER NETWORKS

Time Allotted: 3 Hours | Full Marks: 70

The questions are of equal value.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
All symbols are of usual significance.

GROUP A
(Multiple Choice Type Questions)

1. Answer any *ten* questions. $10 \times 1 = 10$

(i) The Ethernet address is of

(A) 6 bytes (B) 8 bytes
(C) 3 bytes (D) depends on the media

(ii) Which of the following is a private IP address?

(A) 12.0.0.12 (B) 172.15.14.32
(C) 168.172.34.59 (D) 192.168.23.44

(iii) In TDM, for n signal sources of the same data rate, each frame contains _____ slots.

(A) n (B) n + 1
(C) n – 1 (D) 0 or n

(iv) Acknowledgements, sequencing, and flow control are characteristics of which OSI layer?

(A) Physical layer (B) Data link layer
(C) Transport layer (D) Network layer

(v) For Stop-and-Wait ARQ, for n data packets sent, _____ acknowledgements are needed.

(A) n (B) 2n
(C) n – 1 (D) n + 1

(vi) What is the purpose of LCP packets?

(A) Configuration (B) Termination
(C) Option negotiation (D) All of these

(vii) Coaxial cable has conductors with

(A) a common axis (B) equal resistance
(C) the same diameter (D) none of these

(viii) You want to implement a mechanism that automates the IP configuration, including IP address, subnet mask, default gateway and DNS information. Which protocol will you use to accomplish this?

(A) SMTP (B) DHCP
(C) SNMP (D) ARP

(ix) Pure ALOHA has a throughput of

(A) $S = Ge^{-2G}$ (B) $S = 2Ge^{-2G}$
(C) $S = Ge^{-G}$ (D) $S = 2Ge^{-G}$

(x) A subnet mask in class A network has fourteen 1's. How many subnets does it define?

(A) 32 (B) 64
(C) 8 (D) 128

(xi) Manchester encoding is _____ encoding

(A) return to zero (B) non return to zero
(C) return to one (D) none of these

GROUP B
(Short Answer Type Questions)

Answer any *three* questions. 3×5 = 15

2. (a) What are the differences between TDM and FDM? 2
   (b) What do you mean by byte stuffing and bit stuffing? 3

3. Using 5 bit sequence numbers, what is the maximum size of the send and receive windows for each of the following protocols:- 1+2+2
   (i) Stop-and-Wait ARQ
   (ii) Go-Back-N ARQ
   (iii) Selective Repeat ARQ

4. Compare connectionless and connection oriented approaches for connecting networks. 5

5. Explain the frame format of IEEE 802.5 LAN. 5

6. Explain the working of Token ring works. 5

GROUP C
(Long Answer Type Questions)

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

7. (a) What is ATM? 2
   (b) In Selective Repeat ARQ, the size of the sender window must be at most 2m/2. Explain it. 3
   (c) What are the four SONET layers? Discuss the functions of each layer. 5
   (d) Explain classful and classless addressing. 2
   (e) What is the difference between a port address, logical address and a physical address? 3

8.(a) The code 11110101101 was received. Using Hamming encoding algorithm is it possible to detect if there is any error in the received codeword. Justify. 3

(b) Discuss the concept of redundancy in error detection and correction. 2

(c) What is switching? Compare the different types of switching techniques. 4

(d) Define framing and why it is needed? 3

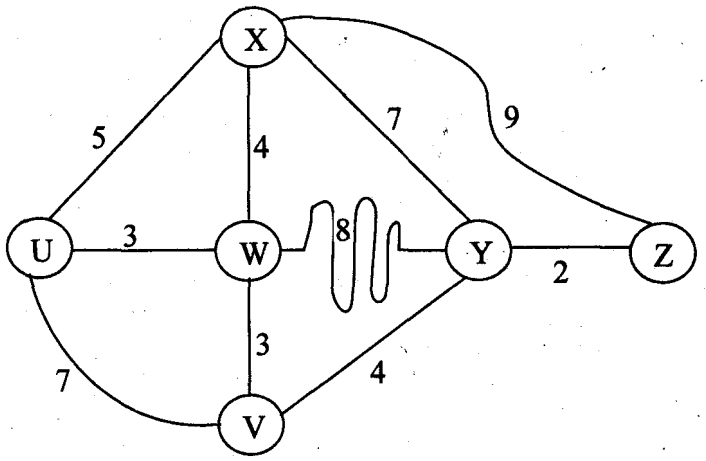
(e) What is HDLC? What is NRM and ABM in HDLC? 3

9. (a) Indicate the advantages of IPv6 over IPv4. 5

(b) What is the IP datagram? Write all fields of IP datagram. 5

(c) What are baud rate and bit rate? Establish the difference between the two. 5

10.(a) Using Dijkstra's algorithm find the shortest routing path from U :- 6



(b) What is static and dynamic routing? 3

(c) Discuss Switched Virtual Circuit (SVC) and Permanent Virtual Circuit (PVC). 6

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

(a) DNS

(b) Piggybacking

(c) UDP

(d) Network topology

(e) PPP