KATHMANDU UNIVERSITY
End Semester Examination [C]
January, 2018

Marks Scored:

Level : B.E./B. Sc.
Year : II
Course : COMP 204
Semester : II
Exam Roll No. :
Time: 30 mins.
F. M. : 10
Registration No.:
Date : JAN. 09, 2018

SECTION "A"
[20 Q. × 0.5 = 10 marks]

Choose the most appropriate answer.

1. BUS, RING and STAR TOPOLOGIES are mostly used in
   a. LAN b. MAN c. WAN d. Internetwork

2. Both stations can transmit and receive data simultaneously in
   a. Simplex Mode b. Half Simplex Mode
   c. Half Duplex Mode d. Full Duplex Mode

3. Layer that are used to deal with mechanical and electrical specifications are
   a. Physical Layer b. Data Link Layer c. Network Layer d. Transport Layer

4. A network with bandwidth of 10 Mbps can pass only an average of 12,000 frames per minute with each frame carrying an average of 5,000 bits. Throughput of the network is.....
   a. 1 Mbps. b. 2 Mbps. c. 3 Mbps. d. 4Mbps.

5. What is the transmission time for a 2.5 kilobyte message if the bandwidth of the network is 1 Gbps? Assume that the distance between the sender and the receiver is 12,000 km and the light travels at 2.4×10^8 ms^{-1}?
   a. 0.01 ms. b. 0.02 ms. c. 0.03 ms. d. 0.04 ms.

6. During transmission if SNR=3dB, the signal .....
   a. is attenuated b. is amplified
   c. remains unchanged d. first is attenuated and then amplified

7. For the data bit of 01100011101010100111111100100101, after bit stuffing the actual message will be of ?
   a. 011000111010101001111101100100101 b. 011000111010101001110111100100101
   c. 011000111010101001011111100100101 d. 011000111010101001101111100100101

8. Which of the following media access control uses channelization?
   a. FDMA b. CDMA c. Polling d. Token Passing

9. Packet data unit of Data link layer is called
   a. Packet b. Frame c. Header d. Segment

10. During Sliding Window Flow Control, if the size of header is of x bit then the sequence number will be from the range _____
    a. 0 to 2^x b. 1 to 2^x-1 c. 0 to 2^x-1 d. 1 to 2^x

11. If a noiseless channel with a bandwidth of 3000 Hz transmitting a signal with 4 signal levels maximum Bit rate would be _____
a. 12000 bps b. 16000 bps c. 6000 bps d. 3000 bps

12. In byte stuffing, the trailer contains
a. data b. source address c. destination address d. redundant bits

13. The technique of temporarily delaying outgoing acknowledgements so that they can be hooked onto the next outgoing data frame is called
a. piggybacking b. cyclic redundancy check
c. fletcher's checksum d. parity

14. What is the vulnerable time for Pure ALOHA where
$T_{fr} = Average\ transmission\ time\ for\ a\ frame$ & $T_B = Backoff\ time$?
a. $2 \times T_{fr}$ b. $½ \times T_{fr}$ c. T_{fr} d. $2\times T_B$

15. What is the address range of a class B network in binary?
a. 01xxxxxx b. 0xxxxxxx c. 10xxxxxx d. 110xxxxx

16. The only address in the block 127.0.0.0/8 is called the .....address.
a. Limited-broadcast b. Loopback c. Private d. Multicast

17. The first address of a given ip address 223.15.18.17/28 is .....
a. 223.15.18.17 b. 223.15.18.0 c. 223.15.18.12 d. 223.15.18.22

18. The technique that requires no network information is _____
a. Flooding b. Variable routing c. Fixed routing d. Random routing

19. Transport layer protocols deals with.....
a. application to application communication
b. process to process communication
c. node to node communication
d. session to session communication

20. We use Cryptography term to make them secure and immune to
a. Change b. Idle c. Attacks d. Defend

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SECTION "B"

[6Q × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. Discuss the advantages and limitations of Bus topology and Ring Topology in detail.
2. Explain different propagation modes of Optical Fiber cable.
3. Explain the working mechanism of Go-Back-N ARQ with suitable flow diagram.
4. Explain Checksum error detecting method with the help of suitable example.
5. Explain the traffic shaping techniques performed by network layer in data communication.
6. Differentiate between TCP and UDP. Explain three way handshake protocol with clear flow diagram.
7. Write short notes on (*ANY TWO*)
   a. Distance Vector Routing Algorithm
   b. Half Duplex & Full Duplex Communication
   c. Electronic Mail

SECTION "C"

[2Q× 8 =16 marks]

Attempt *ANY TWO* questions.

8. a. Explain OSI Reference Model in brief. [4]
   b. Implement Cyclic redundancy check for the polynomial for the divisor is: x^3+x^2+1 & The polynomial for the dataword is $(x^2+x+1)(x^4+x^3+x+1)$ [4]
      i. Show the checking of the codeword at the receiver side assuming no error has occurred.
      ii. What is the syndrome at the receiver end if the dataword has an error in the 2^{nd} bit position counting from the right?
9. a. Differentiate between Circuit Switched Network and Packet Switched Network. [4]
   b. Differentiate between public key cryptography and private key cryptography. Explain procedure of private key cryptography in brief. [4]
10. An ISP is granted block of addresses starting with 190.80.0.0/16. The ISP needs to distribute these addresses to three groups of customers as follows:
    a. The first group has 50 customers, each needs 256 addresses.
    b. The second group has 200 customers, each needs 32 addresses.
    c. Design the subblocks and find out how many addresses are still available after these allocations.

    [3+3+2]