KATHMANDU UNIVERSITY
End Semester Examination [C]
June/July 2024

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 13 JUN. 2024

SECTION "A"
[20Q. × 0.5 = 10 marks]

Encircle the most appropriate answer.

1. A period of 10 ms in microseconds.
[ ] $10^4\ \mu s$ [ ] $10^{-5}\ \mu s$ [ ] $10^5\ \mu s$ [ ] $10^{-4}\ \mu s$

2. A packet at the datalink layer is normally called as _____
[ ] Bits [ ] DPDU [ ] Packet [ ] Frame

3. High Frequency (LF) ranges from _____.
[ ] 3 - 30 kHz
[ ] 30 - 300 kHz
[ ] 3 - 30 MHz
[ ] 30 - 300 GHz

4. A television broadcast is an example of _____transmission.
[ ] Simplex [ ] Half-duplex [ ] Full-duplex [ ] None

5. The concept of "Crosstalk" is used in _____.
[ ] Twisted-Pair Cable [ ] Coaxial Cable [ ] Fiber-Optic Cable [ ] Infrared

6. UDP provides _____service.
[ ] Connection-oriented
[ ] Reliable
[ ] Connectionless
[ ] Connection-oriented as well as Connectionless

7. For a dataword of 1001, the divisor of 1011 and n-k=3, the final codeword is _____
[ ] 1001111 [ ] 1001000 [ ] 1001001 [ ] 1001110

8. Bit stuffing is the process of adding one extra 0 whenever _____ consecutive 1s follow a 0 in the data.
[ ] five [ ] eight [ ] nine [ ] six

9. Vulnerable time for CSMA is
[ ] T_{fr} [ ] $2\times T_{fr}$ [ ] T_p [ ] $2\times T_p$

10. Which one of the following is a Random access protocol?
[ ] TDMA [ ] Polling [ ] Token Passing [ ] ALOHA

11. Carrier sense multiple access with collision avoidance (CSMA/CA) was invented for _____
[ ] wireless networks
[ ] wire networks
[ ] both (wireless as well as wire) network
[ ] none

12. What is the port number of the POP3?
[ ] 21 [ ] 53 [ ] 25 [ ] 110

13. What is the address range of a class C network address in binary?
[ ] 01xxxxxx [ ] 0xxxxxxx [ ] 10xxxxxx [ ] 110xxxxx

14. The only address in the block 127.0.0.0/8 is called the _____address.
[ ] Limited-broadcast [ ] Loopback [ ] Private [ ] Multicast

15. The values of SNR and SNR_{db} for a noiseless channel are :
[ ] SNR = 0, $SNR_{db} = 0$
[ ] SNR = 0 , $SNR_{db} = \infty$
[ ] SNR = ∞ , $SNR_{db} = \infty$
[ ] SNR = ∞ , $SNR_{db} = 0$

16. Which attacks is associated with "Threat to confidentiality"
[ ] Modification [ ] Snooping [ ] Masquerading [ ] Replaying

17. For *m* size header the size of receive slide window for selective repeat protocol is _____
[ ] 2m [ ] 2^m [ ] 2^{m-1} [ ] 2^{m+1}

18. Which one is correct?
[ ] Latency = propagation time+ transmission time+ queuing time + processing delay
[ ] Latency = propagation time + transmission time
[ ] Latency = transmission time + propagation time+ queuing time
[ ] Latency = transmission time

19. If the decibel of a signal is positive, the signal _____
[ ] is attenuated
[ ] remains unchanged
[ ] is amplified
[ ] first is attenuated and then amplified

20. The notation is informally referred to as *slash notation* and formally as _____
[ ] classless interdomain routing
[ ] classless addressing
[ ] class interdomain routing
[ ] class domain route

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Level : B.E/B.Sc.
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03 JUL 2024

Course : COMP 204
Semester : II
F.M. : 40

SECTION "B"
[6Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. Explain the five component of a data communication system. [4]

2. Explain the working mechanism of Stop and Wait ARQ with suitable flow diagram. [4]

3. Explain three way handshake protocol with clear flow diagram. [4]

4. A standard transmission line has a bandwidth of 2 MHz assigned for data communication and its SNR_{db} is 36. Calculate the capacity for this channel. [4]

5. Explain guided media and its types with suitable diagram. [4]

6. Explain leaky bucket and token bucket algorithm. Briefly explain which among the two is more efficient and why? [2+2=4]

7. Write short notes on (Any Two) [2+2=4]
   a. Transposition Cipher
   b. Denial of Service
   c. TCP

SECTION "C"
[2Q × 8 marks = 16 marks]

Attempt *ANY TWO* questions.

8. a. Explain why CSMA/CD does not require an acknowledgement mechanism, but CSMA/CA does. Use a diagram if necessary. [4]
   b. List the three phases of Connection Oriented Service and explain them. [2]

9. a. Explain with diagram for encoder and decoder how simple parity check code works with suitable diagram. Assuming 4 bit dataword generate all possible codeword. Show that simple parity check guarantees to detect any odd number of errors. [6]
   b. What are the propagation time and the transmission time for a 5 MB message if the bandwidth of the network is 1 Mbps? Assume that the distance between the sender and the receiver is 12,000 km and that light travels at 2.4×10^8 m/s. [2]

10. a. An organization is granted a block of addresses with the beginning address 14.24.74.0/24. The organization needs to have 3 subblocks of addresses to use in its three subnets. First subblock of 10 address, second subblock of 60 addresses and third subblock of 120 addresses. Design the subblocks. [4]
    b. Explain "count to infinity" problem with suitable example. [4]