

## Mid-term Qns.

- LAN
1. Compare bridge, hub, switch, router.  
- similarity, differences, strength, weakness
- Transmission Media.
2. Why certain devices are used for certain bandwidths?
  3. How does info flow in different cable types (pair twisted, coaxial, fibre).
  4. Compare all cable types (strength & weakness)
- Signal Encoding
5. Given a binary string, draw how each method encode data to digital signal?
  6. Compare AM & FM.
  7. Compare ASK, FSK & PSK, QAM (strength & weakness)
  8. Compare strength & weakness of each encoding scheme.
  9. How modulator work (sender/receiver), explain the mechanism (formulas), give an example (refer to note,  $f_c + f_m$ ,  $f_c - f_m$ ).
  10. How data scrambling work?
  11. Practice QPSK & OQPSK modulator at home (S. 11).
  12. Relationship & formula of data rate (bps), bit length ( $t_b = \frac{1}{\text{Data rate}}$ ), signal rate (modulation rate - baud) & bandwidth, frequency,  $\lambda$ , etc.
  13. What affect the receiver to interpret incoming signal? (slides)

LS:-Trans  
mission  
Media.

14. What are factors affect Data Rate & Distance. (slide 2)

15. What are the common. guided & nonguided media.  
commonly in used?

Ans: Guided media: twisted pair, coaxial cable, optical fiber

16. Describe most common guided media for analog signal? (twisted pair)

17. What is NEXT (near end crosstalk)

cheat sheet

18. Compare Twisted Pair, Coaxial Cable, Optical Fiber  
(def, trans characteristic, strength, weakness,  
attenuation, application.

(slide 20)

19. What are transmission modes of optical fiber.? compare.

20. What types of wireless transmission, its freqs, application?

21. Antenna gain ( $G_{db}$ ) & formula. (S 27) (Slide 23)

(22. Potential: Terrestrial & Satellite Microwave Antenna S 28, 29.)

[LAN]

23. what is star topology?

24. What is IEEE 802? Describes DLC layer (MAC, LLC).  
(Physical, DLC) (Slide 6)  
S 7.

25. Diagram of A MAC frame structure. (S 9/14)

26. What are 3 LLC services? (S. 11/13)

compare them.  $\uparrow$  protocols

(error control, def, flow control.)

27. In MAC protocol, what are 2 techniques used?  
(S 15).

(S15, 16 →)  
28. What are the 3 approaches used in async MAC protocol?  
Compare def, strength & weakness, starvation?

29. In IEEE 802, which layer takes care of (S17).  
- flow control.  
- error detection.

30. Compare: Bridge, Hubs, layer 2 switch (S18) 34.  
(Reliability, Performance, Security, Geography). (Notes: 1625)  
Strength, weakness

31. Does Bridge needs to have LLC layer?

Ans: No, it only relay the MAC frame, no stripping of MAC fields. Bridge only implements phy/MAC layers.

Optional 32) Fixed routing v/s dynamic routing. (S24)

33. 3 mechanism a bridge uses to update its routing table.  
base on spanning algo.

34. 2 types of layer 2 switch. (def, benefit, str & weakness) (S33)

35. Why we need VLAN, def (S37, 38)

36. What 3 types of VLANs?

## [Error Detection & Correction]

37. 2 types of parity check?

38. What is the Internet Checksum.

39. What is CRC.

Optional: 40. Forward Error Correction  
41. Block Code Principles.

## [DLC Protocol]

- 42. Describe & compare 2 flow control techniques. (S4→)
- 43. What are the 4 requirements of error control techniques (9)
- 44. Compare 4 techniques of Error control in DLC (S10→)
- 45. Draw how frame transmit in each technique
- 46. Describes 3 types of stations in HDLC. (S16)
- 47. Describe 2 links configurations in HDLC (S10)
- 48. Compare 3 transfer modes of HDLC. (S17)
- 49. Describe HDLC Frame Structure
- 50. What is bit stuffing? (S19)
- 51. How many frame types of HDLC. (S24)
- 52. Example of HDLC operation (S26)

## [Data transmission]

- 53. Examples of Guided Media & Unguided Media. (S2)
- 54. Describes [Direct link, Point to Point, Multi Point],  
and [Simplex, Half Duplex, Full Duplex]
- 55. Relationship of  $\lambda, f, T, c$   
Ans:  $\lambda = vT \Rightarrow \lambda f = v = c$   
 $\uparrow$   
c (in vacuum)
- 56. (Optional) identify frequency of a  $\sin/\cos$  equation.  
amplitude  
phase
- 57. What is DC component in signal
- 58. Example of Analog Data, Digital Data, compare.
- 59. Example of Analog Signal, Digital Signal, compare.
- 60. (Optional) What are the advantages of using Digital over Analog signal (S28)

61. Compare Synchronous v/s Asynchronous Transmission. (S29)
62. What are signal impairments in Analog & Digital signal transmission (P30).
63. What are 4. categories of noise? Which one is white noise, compare them. (P35, 36...)
64. What are the factors defining a Channel Capacity? (P37)
65. In case of noise free, what does Nyquist formula mean?
66. Consider some noise, what are Shannon Formula telling us?

