SOCIAL CLUB

done

CSC 425

EXAM 1

ANSWER ALL THE FOLLOWING QUESTIONS:

1) True/ False (12 points)

F a- A network service is concerned with the semantics and content of the user data. F

F b- A data link layer provides error detection and end-to-end acknowledgement across multiple links. F

T c- The higher bit error rate of the network links, the smaller the maximum packet size must be. T F

F d- The shorter the maximum packet size, the longer is the packet transmission delay. F

T ~~e- Bit stuffing is used to prevent incorrect interpretation of the user data field.~~ T

F f- The transmission time of a frame of 1 Kbits over a link of 1 Mbps is 1 s. F

T g- The propagation delay is a function of the frame length and the propagation speed over a given data link. T

T h-Twisted pair cables are easy to install, very cheap and immune to crosstalk problem. T

T i- Thin-wire coax are used to connect DTEs in the same office while thick-wire coax are used along a corridor. T

F T j-With coax, duplex data communication can be provided only when two separate cables are used, one for the transmit channel and the other for the receive channel.

T k- IP, the internet protocol, is responsible for routing and handling incompatibilities among different networks. T

F l- The Simple Network Management Protocol (SNMP) is used to keep track of host names and Internet addresses on the Internet. F

2) Write the *name* of the layer and its *number* in the OSI Model: (10 points)

4 End-to-end message transfer (connection management , error & flow control) → Transport Layer (Layer 4)

1 Mechanical and electrical network interface definitions → Physical layer (layer 1)

3 Routing, addressing, call set-up and clearing, internetworking → Network layer (layer 3)

6 Transfer syntax negotiation, data representation transformations → Presentation layer (layer 6)

5 Dialog and synchronization control for application entities → Session layer (layer 5)

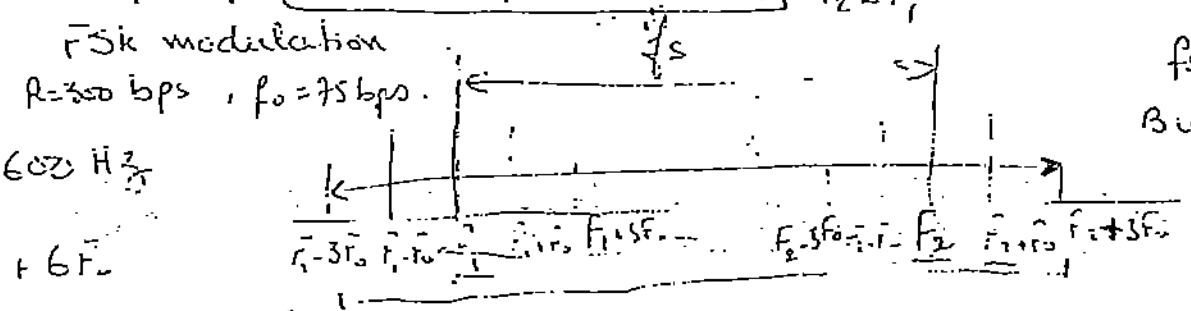
2 Data link control (framing, data transparency, error control) → Link layer (layer 2)

7 File transfer, electronic mail, concerned with the data semantic → Application layer (layer 7)

3) Match the transmission media to the appropriate property: (6points)

(c) Two-wire open lines	a) used to interconnect very remote areas
(d) Twisted-pair lines	b) used in wireless LANs
(f) Coaxial cables	c) has a Crosstalk problem
(e) Optical fibre	d) used in telephone and data networks
(a) Satellites	e) Immune to electrical noise
(b) Radio	f) used in baseband or broadband modes

4) FSK modulation: First *Draw* then *Estimate* the bandwidth required of a channel to transmit 300bps. Assume the frequency shift is 600Hz, and the fundamental frequency component plus the 3rd harmoniques are received only. (14 points)



$f_s = 600Hz$

$Bw = f_s + 6F_0$

$f_s = 600 Hz$

$3w = f_s + 6F_0$

$F_0 = \frac{BR}{4} = \frac{300}{4} = 75 Hz$

$Bw = 600 + 6 \times 75 = 1050 Hz$

$BW = F_2 - F_1 + 6f_0$

600Hz

$f_0 \quad \frac{BR}{4}$

$w = F_2 + 3f_0 - F_1 + 3f_0 = f_s + 6f_0$

$= 600 + 6 \times 75 = 1050 Hz$

$R = 300$

$f_0 = \frac{R}{4} =$

$f_s = 600$

5) Assuming asynchronous transmission, one start bit, two stop bits, one parity bit, and four bits per signalling element, derive the useful information rate in bps if the signalling rate is 300 *baud*. $R_S = 300$ bps. (8 points)

1 start bit, 2 stop bits, 1 parity bit

4 bit/signaling element

$R_S = 300$ baud

$R = R_S \cdot 4 = 4 \times 300 = 1200$ bps

? → 12

? ← 1200

$1 + 1 + 7 + 2 = 11$

$m = 4$

$M = 4^2 = 16$

$R_S = 300$

$R = R_S \log_2 M$

$R = 4 \times 300 = 1200$

$1200 \times \frac{7}{11}$

$x' = \frac{300}{2300} \times 60$

Nb of char $= \frac{56k \times x}{8}$

N = Nb of frames (max) $= \frac{56k \times x'}{3 \times 260}$

Signal of frames $= \frac{N}{1.26}$

Nb of char $= \frac{N}{1.26} \times (250)$ ← useful data

b of invoice per day $= \frac{N}{1.26} \times \frac{2500}{3600}$

k
1
3
5
10