Type: DES

Q1. Draw the ATM reference model. Explain the functions of each layer in detail. (4)

Q2. Represent the bit stream "11001010" using the following encoding techniques. (3)
i) Manchester ii) Differential Manchester iii) NRZ-I iv) Bipolar v) RZ vi) NRZ

Q3. Synchronous TDM used to multiplex the data from two channels where each channel creates 1char/sec. Show the output with arbitrary inputs if the unit of data is 2-bits and 1-bit is for frame level synchronization. Also find:

(i) data rate of each source (ii) duration of each character at each source (iii) frame rate (iv) frame duration (v) number of bits per frame (vi) data rate of the link. (3)

Q4. Discuss the switching techniques in detail with the help of necessary diagrams. (4) Q5. We would like CAT-3 twisted-pair cable to be used for telephone lines to transmit voice information. What is the minimum SNR in dB required? (3)

Q6. Calculate the checksum for the following IPv4 packet. (3)

0x4	0x5	0x00	4410	
9D08			010 ₂	000000000000 ₂
12810		0x06	8BFF	
128.143.137.144				
128.143.71.21				

Q7. Manipal Academy of Higher Education (MAHE) is granted with a block of addresses and one of the addresses is 160.124.228.200/19. MAHE needs to allocate these addresses to its three Institutes MIT, KMC, MCODS as follows:

a) MIT has 24 departments and each department needs 115 addresses

b) KMC has 20 departments and each department needs 56 addresses

c) MCODS has 10 departments and each needs 28 addresses.

Design the subblocks for each institute and mention the range of addresses still available after these allocations. (4)

Q8. i) What is the minimum frame size to hear all collisions in Ethernet LAN using 10Base-F cable? ii) A large population of ALOHA users manage to generate 50 requests/sec, including both originals and retransmissions. Time is slotted in units of 40 msec. What is the chance of success on the 2nd attempt? (3)

Q9. Derive the link utilization of Stop-and-Wait Protocol for a noiseless link as well as a noisy link. (3)

Q10. If 2-bits are used to represent frames, then what should be the maximum window sizes of sender and receiver in Selective Repeat ARQ, Go-Back-N ARQ? Justify your answer by illustrating the frame transmissions with suitable examples. (4)

Q11. Illustrate the count to infinity problem by updating routing table at node 'A' for the following topology before and after the link breaks between the nodes 'A' & 'D'.



Q12. Find the channel utilization for the following links using Stop-and-Wait protocol and draw the conclusions.



Q13. Illustrate the call establishment and terminations mechanisms in TCP with the help of suitable diagrams. (4)

Q14. For the following subnet, form the complete routing table maintained at node 'B' using Distance Vector Routing algorithm. Mention the routing updates. (3)



Q15. Mention the steps involved in mapping domain names to an IP address. (3)