Duration: 3 Hrs. **Total Marks : 80**

N.B.: 1) Question No. 1 is Compulsory.
2) Attempt any three questions, from remaining five questions.
3) Figure to the right indicates full marks

Q.1.	a)	State and explain the design issues of OSI layers.	**5**
	b)	Compare the performance characteristics of coaxial, twisted pair and fiber optic transmission media.	**5**
	c)	List the types of Error Detection and Correction techniques with the help of example.	**5**
	d)	Compare the Network layer protocols IPv4 and IPv6.	**5**
Q.2.	a)	Explain ISO-OSI reference model with diagram.	**10**
	b)	Illustrate TCP protocol for establishing a connection using 3-way handshake technique in the transport layer.	**10**
Q.3.	a)	What is the throughput of the system both in Pure ALOHA and Slotted ALOHA, if the network transmits 200 bits frames on a shared channel of 200 Kbps and the system produces? a) 1000 frames per second b) 500 frames per second	**10**
	b)	Analyze the steps involved in Token and Leaky bucket algorithm by quoting the need and benefit in the network layer with suitable diagrams.	**10**
Q.4.	a)	Explain Linked State Routing with the help of example.	**10**
	b)	An ISP is granted a block of addresses starting with 190.100.0.0/16 (65,536 addresses). The ISP needs to distribute these addresses to three groups of customers as follows: a. The first group has 64 customers; each need 256 addresses. b.The second group has 128 customers; each need 128 addresses. c.The third group has 128 customers; each need 64 addresses. Design the subblocks and find out how many addresses are still available after these allocations.	**10**
Q.5.	a)	What is Congestion control? Explain Open loop and Close loop Congestion control.	**10**
	b)	Draw and summarize the structure of HTTP request and response.	**10**
Q.6.		Write Short Note on (**Any Two**) (a) Address Resolution Protocol (ARP) (b) Classful and Classless Addressing (c) Distance Vector Routing (DVR)	**20**

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