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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