

**C2-R4 : ADVANCED COMPUTER NETWORKS****NOTE :**

1. Answer question no. 1 and any FOUR questions from 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

**Time : 3 Hours****Total Marks : 100**

1.
  - (a) Distinguish between Transmission Control Protocol (TCP) and User Datagram Protocol (UDP).
  - (b) What is Traffic Shaping in Asynchronous Transfer Mode (ATM) ?
  - (c) Streaming Protocol is a network protocol designed for use in entertainment and communications systems to control streaming media servers. List and explain the various protocols used in Streaming Protocol.
  - (d) Differentiate between Pure Aloha and Slotted Aloha.
  - (e) The Real-Time Streaming Protocol (RTSP) establishes and controls either a single or multiple time-synchronized streams of continuous media such as audio and video. How does it differ from normal http behavior ?
  - (f) What are the services provided by ATM CPAAL3/4 ?
  - (g) How does network layer reacts to different quality of service parameters ? (7x4)
2.
  - (a) The function of TCP is to change data rate transmission as per the congestion present in the network. What methods are adopted by TCP to negotiate high and low congestion in network ?
  - (b) Distance vector multicast routing protocol is multicast data transmission protocol over networks. What are the features of DVMRP ? What decision making strategies used by DVMRP ? (9+9)
3.
  - (a) Remote Procedure Call (RPC) is an inter-process communication that allows a computer program to call a subroutine or procedure to execute in another address space. List the sequence of events during a RPC.
  - (b) IPv6 (Internet Protocol version 6) was developed to overcome address exhaust problem of IPv4. Write down the salient features of IPv6 as compared to IPv4.
  - (c) What is purpose of Closed Jackson Network ? State and prove Closed Jackson Network Theorem. (4+6+8)
4.
  - (a) How is data transmitted from one network to another in an ATM network using their virtual path and virtual channel ?
  - (b) TCP is implemented on connectionless IP services. IP does not guarantee for flow control. How does TCP achieve flow control ?
  - (c) TCP is Connection Oriented Protocol which establishes connection before data transfer. Explain the TCP connection establishment phase. (6+6+6)

5. (a) ATM is a telecommunications concept defined by ANSI and ITU. What are the real time and non-real time services provided by ATM ?  
(b) IPv6 is an Internet-Layer Protocol for packet-switched internet working and provides end-to-end datagram. Write and explain IPv6 Extension Header.  
(c) A Virtual Private Network (VPN) is a technology that creates a safe and encrypted connection over a less secure network, such as the internet. Differentiate between a site-to-site VPN and a Remote Access VPN ? (5+6+7)
6. (a) What are the causes of packet loss in IP network ? Suggest methods to reduce packet loss.  
(b) Draw and explain protocol stack of ATM.  
(c) Protocol-Independent Multicast (PIM) is a family of Multicast Routing Protocols for Internet Protocol (IP) Networks. Write down variants of PIM and explain any two in detail. (6+6+6)
7. (a) In ATM, Connection Admission Control is the set of actions taken by the network during the call set-up phase to establish if a virtual path or virtual channel can be accepted by the network. How does it perform traffic control procedure, Network Resource Management and connection admission control mechanism ?  
(b) Multicast is a communication pattern in which a source host sends a message to a group of destination-hosts. List and explain in Short Multicast Routing Algorithms : Spanning Tress, Reverse Path Broadcasting and Truncated Reverse Path Broadcasting. (9+9)

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