Assignment 03
Unit 03.

(1) Write in brief about :

(a) Different types of ARP (Gratuitous ARP, Proxy ARP).

→ **Gratuitous ARP**

Gratuitous Address Resolution Protocol is used in advance network scenarios. It it something performed by computer while booting up. When the computer booted up (Network Interface card is powered) for the first time, it automatically broadcast its MAC address to the entire network. After Gratuitous ARP MAC Address of the computer is known to every switch and allow DHCP servers to know where to send the IP address if requested. Gratuitous ARP could mean both Gratuitous ARP Request and Gratuitous ARP reply, but not needed in all cases. Gratuitous ARP request is a packet where source and destination IP are both set to IP of the machine issuing the packet and the destination MAC is the broadcast address ff:ff:ff:ff:ff:ff. no reply packet will occur. Gratuitous ARP is ARP - Reply that was not promoted by an ARP - Request. Gratuitous ARP is useful to detect IP conflict. Gratuitous ARP is also used to update ARP

mapping table and switch port MAC address table.

Proxy ARP

Proxy ~~ARP~~ ARP was implemented to enable devices which are separated into network segments connected by a router in the same IP network or sub-network to resolve IP address to MAC addresses. When devices are not in same data link layer network but are in the same IP network, they try to transmit data to each other as if they were on the local network. However, the router that separates the devices will not send a broadcast message because routers do not pass hardware-layer broadcasts. Therefore, the addresses cannot be resolved. Proxy ARP is enabled by default so the "proxy router" that resides between the local networks responds with its MAC address as if it were the router to which the broadcast is addressed. When the sending device receives the MAC address of the proxy router, it sends the datagram to the proxy router, which in turns sends the datagram to the designated device.

(b) IPv6 Enhancements

→ IPv6 (IP version 6) is a replacement design. IPV6 has longer addresses than IPV4. IPv6 are 128 bits long, which solves the problem of providing an effectively unlimited supply of Internet addresses. It contains only seven fields (where 13 in IPv4). This change allows routers to process packets faster and thus improves throughout and delay major improvement is better support for options. This change was essential with the new header because fields that previously were required are optional. Authentication and privacy are key features of the new IP. IPv6 is not compatible with IPv4, but it it compatible with other auxiliary IP, including TCP, UDP, ICMP, IGMP, OSPF, BGP and DNS, with small modifications being required to deal with longer addresses. The IPv6 header has fixed length of 40 octates, consisting of field such as version (4 bits), DS / ECN (8 bits.), Flow label (20 bits), Payload length (16 bits), Next Header (8 bits), HOP limit (8 bits), source Address (128 bits) and Destination address (128 bits).

(c) Intra- and Interdomain Routing

→ Intradomain Routing

Intradomain as name suggests is a protocol in which Routing algorithm works only within the domains. Intra Domain Routing has to interact with the domain so only information of different components within the domain is required. ~~Protocols used in Intra Domain Routing is~~ Exterior-gateway protocols such as BGP (Border Gateway Protocol) are being get used in case of Intra Domain Routine. Prerequisite for Intra Domain Routing internet within the domain should be connected and available during the transmission. Intra Domain Routing is less complex and less interdependent as compared to that of Inter-Domain Routing.

Inter Domain Routing

Inter Domain Routing as name suggests is the protocol in which Routing algorithm works within and between domains. In case of Inter Domain the interaction is between different domains so information of components of other domains is also required. In Inter Domain Routing Interior-gateway protocols such as RIP (Resource Information Protocol) and OSPF (Open Shortest Path First) are being used. Prerequisite for Inter Domain Routing Internet within the domain and in domain with which the interaction is going on should be connected

and available. Inter Domain Routing is more complex and more dependent ~~and~~ ~~the~~ as compared to that of Intra Domain Routing.

(d) Interior gateway Protocol and Exterior gateway protocol.

→ Interior gateway Protocol

An ~~itor~~ interior gateway protocol (IGP) is a type of protocol used for exchanging routing information between gateways (commonly routers) within an autonomous system ~~(for~~. This routing information can then be used to route network-layer protocols like IP. Interior gateway protocols can be divided into two categories: distance-vector routing protocols and link-state routing protocols.

Exterior Gateway Protocol

Exterior Gateway protocol (EGP) is used to exchange net- reachability information between Internet gateways belonging to the same or different autonomous systems. EGP is a simple reachability protocol, and unlike modern distance-vector and path-vector protocols, it is limited to tree-like topologies ~~and~~ and does not support multipath networking environments, making it less efficients.