Ans. to the ques No- 1(a)

ques: Difference between Tcp and UDP ?

Ans:

TCP	UDP
It is a connection oriented protocol.	It is a connectionless protocol.
The speed of TCP is slower.	UDP is faster as error recovery is not attempted.
Header size is 20 bytes	Header size is 8 bytes.
Tcp rearranges data packets in the specific order.	UDP Protocol has no fixed order because all packets are independent of each other.

Ans to the ques No- 1 (b)

ques: . what are some real-time application where we use TCP and UDP?

Ans:

- Tuneling / VPN (lost packet are ok- the tunneled protocol takes care of it.
- Media streaming (lost frames are ok).
- Games -that dont care it you get every update.
- local broadcast machanisms..

TCP:

- web- SSH, FTP, telnet.
- SMTP, sending mail.
- IMAP/POP, receiving mail.

Ans. to the ques No- 1(c)

Ques: How TCP/IP works?

Ans: Tcp allows for transmision of information In both direction. This meam that, computer systems that communicate over TCP com send and ~~Are~~ receive data at the some time, similar to a tele phone conversation. The tcp software in the network Protocol stack of the operating system is responsible for establishing and terminating the end to end connections as well as transferring data

The Tcp software is controlled by the various network applications, such as web browsers or servers, via specitic interface. All that, matters is anumes the dient role and which the, the Tcp software is provided with a unique ordered pair consisting of IP address and port for each people.

Ans. to the ques No-2 (a)

ques: what is UDP?

Ans: User Datagram protocol (UDP) is a Transport layer protocol. UDP is a part of Internet Protocol suite; referred as UDP/IP suite. unlike TCP, it is unreliable and connectionless protocol, so, there is no need to establish connection prior to data transfer.

Though transmission control Protocol (TCP) is the dominant transport layer protocol used with most of Internet services; Provides assured delivery, reliability and much more but all these services cost us with additional overhead and latency. Since high performance is needed of processing delayed packets. There is no error checking in UDP. so it also saves bandwidth.

Ans. to the ques No- 2(b)

ques: what are the features of UDP ?

Ans. Features of UDP,

- Provides connectionless, unreliable service.
- So UDP faster than TCP.
- Adds only checksum and Process to Process addressing to IP.
- Used for DNS and NFS.
- Used when socket is opened in datagram mode.
- It sends bulk quantity of packets.
- No acknowledgement.
- It does not care about the delivery of the packets or the sequence of delivery.
- No flow control/~~or~~ contestion control, sender can overrun receiver's buffer.

Ans. to the ques No- 2(c)

Ques: -Describe about the application of UDP. ?

Ans: - Application of UDP:

- used for simple request responce, communication when size of data is less and hence there is lesser concern about flow and error control.
- It is suitable protocol for multicasting as UDP supports packet switching.
- UDP is used for some routing update protocols like RIP.
- Following implementations uses UDP on a transport layer protocol.
  - NTP.
  - DNS.
  - BootP, DHCP
  - NNP

Ans. to the ques No- 3(a)

Ques: what do you mean by TCP ? Elaborate it.

Ans: The transmission control protocol (TCP) is a transport protocol that is used on top of IP to ensure reliable transmission of packets.

i) Recognizing and resending lost packets.

ii) Retesting and dropping duplicate packets.

iii) Recognizing and reording the ## packets that arrive out of order.

iv) controlling the over-flow of segments.

Ans. to the ques No- 3(b)

Ques: what are the services of TCP ?

Ans: The transmission control protocol is the most common transport layer protocol. It work together with IP and provides a reliable transport service between process using the network layer service provided by the IP protocol.

The various services provided by the TCP to the application layer are as follows:

1. Process to process communication -

This provides process to process communication i.e the transfer of data takes place between individual process executing on end system.

2. Stream oriented :-

This means that, the data is sent and received

as a stream of bytes. However, the network layer, that provides service for the TCP, sends packets of information not stream of bytes.

3. Full duplex service: This means that that the communication can take place in both directions at the same time.

4. connection oriented service.

unlike UDP, TCP provides connection oriented service. It defines 3 different phase.

5. Reliability. TCP is reliable as it uses check sum for error attempts to recover lost or corrupted packets by re-transmission, acknowledgement policy and timers.

Ans. to the ques No- 3(c)

ques: Define multiplexing and headers in TCP?

Ans:- A TCP connection is specified by a 4-tuple (source ip address, source port destination IP address, destination port)

* Arriving segment directed according to ~~a~~ connect 4-tuple -

TCP Header:-

Port Numbers -

* A socket identifies a connection end point IP address + port.
* A connection specified by a socket pair.

. well known port -

- FTP - 20.
- ~~FTP~~ 2 Telnet 23.
- DNS - 53

Ans. to the ques No-4(a)

Ques: what do you mean by transport layer?

Ans: Transport layer offers peer-to-peer and end-to-end connection between two process on remote hosts. Transport layer takes data from upper layer and then breaks it into smaller size segments numbers each byte.

Ans. to the ques No-4(b)

ques: Define the transport layer functions?

Ans: This layer is the first one which breaks the information data, supplied by Application layer in to smaller units called segments. It numbers every byte in the segment and

maintain their accounting.

This layer ensures that data must be received in the same sequence in which it was sent. This layer provides end-to-end delivery of data between hosts which may or may not belong to the same subnet.

All process over the network are equipped with well-known Transport Service Access points also known as port numbers.

Ans. to the ques No - 5(a)

Ques: what are in Packet Fragmentation?

Ans: Packet fragmentation can be handle at many different Protocol layers. TCP already includes Packet reassembly. If your dissector needs to do additional packet reassembly then you can utilize the reassembly then you can utilize the reeembly functions defined in Ethereal. A good Example of how to handle packet reassembly by TCP is located in section 2.7 of the a ReadME, Developer document in the -doc-directory. It covers how to handle the packet reamembly. when your dimector is running on top of TCP or UDP Datagram Protocol, the logic involved in defragmented packets can be very complicated.

Ans. to the ques No- 5(b)

ques: what do you mean by internet Protocol version 4?

Ans: Internet protocol version 4(IPv4) is the fourth revision of the internet protocol and a widely used protocol in data communication over different kinds of network. IPv4 is a connectionless protocol used in packet-switched layer networks, such as Ethernet. This model ~~gua~~ guarantees neither delivery nor avoidance of duplicate delivery these aspects are handled by the upper layer transport. IPv4 is defined and specified in IETF publication RFC 791. IPv4 uses 32-bit addresses for Ethernet communication in five classes: A, B, C, D and E. classes A, and B and C have different

bit length for addressing the network host. class A has subnet mask 255.0.0.0 or/8, B has subnet mask 255.255.0.0. or/16 and class C has subnet mask 255.255.255.0 or/24. For example with a/16 subnet mask, the network 192.168.0.0 may use the address range of 192.168.0.0 to 192.168.255.255.

Ans. to the ques No-5(c)

Ques: can you elaborate internet protocol version 6?

Ans: IPv6 was developed by Internet Engineering Task Force (IETF) to deal with the problem of IPv6 exhaustion. IPv6 is 128-bit address having an address space of 2^128, which is way bigger than IPv4

In IPv6 we use colon-hexa decimal representation.

In IPv6 representation, we have three addressing methods;

- unicast
- multicast
- Broadcast.

Unicast: unicast address identifies a single network interface. A packet sent to unicast address is delivered to the interface identified by that address.

multicast is used by multiple hosts called an ~~GROUP~~ GROUP; acquires a multicast destination address. These hosts need not be geographically together. If any packet is sent to this address, it will be distributed to all interface corresponding to that multicast.

Anycast: Anycast address is assigned to a group of interface. Any packet sent to Any cast address will be dellivered to any one number interface.

Ans. to the ques No-5(a)

Ques: Differentiate between unicast an routing and multicast routing protocols?

Ans: A unicast transmimion/stream sends 1 IP packaten to a single recipient on a network. A Multicast transmimion sends IP packets to a group of hosts on a network. If the streaming video is to be distributed to a single desti, nation then you would start a unicast stream by setting the destination IP address and port on the NVN equal to the destination's vale. If you want to view the stream at multiple concurrent location, then you would set The AVN's destination IP address to a valid multicast IP address range from 224.0.0.0 - 239.255.255.255 the first octet (224.xxx.xxx.xxx) is generally reserved for administration.

Ans. to the ques No-6(b)

ques: which are the characteristics and advantage of flooding algorithm?

Ans: characteristics-

- All pomible routes between source and destination is tried. A packet will always get through if path exist.
- As all routes are tried, there will be atleast one route which is the shortest.
- All nodes directly or indirecly connected are visited.

Advantages of flooding:

- Highly robust, emergency or immediate menages can be sent.
- set up no route in virtual circuit.

Ans to the ques No - 6(c)

Ques: what do you know about shortest path algorithm in network routing ?

Ans: Data transfer operations in a ~~for~~ crucial aspect in case of networking and routing. So, efficient data transfer operation is a must need, with minimum hardware cost and also in the minimum time possible. Thus, the need is to propose an algorithm that finds the shortest path between two nodes.

Let's see a completely new algorithm unlike Dijkstra shortest path or any other algorithm for finding shortest path.

Ans. to the ques No-7(a)

Ques: what are the types of network address? Define it.

Ans: There are four types of network address. They are:

1. Unicast address: unicast address represent a single LAN interface. A unicast frame will be sent to a specific device, not to a group of devices on the LAN.

2. Multicast Address: Multicast address represent a group of devices in a LAN. A frame sent to a multicast address will be forwarded to a group of devices on the LAN.

3. Broadcast Address: Broadcast address represent all device on the LAN. The broadcast address

has the value of FFFF.FFFF.FFFF. (all binary ones)

Ans. to the Ques No - 7(b)

Ques: what are the unicast routing protocols?

Ans: unicast routing protocols:

There are two kinds of routing protocols available to route unicast packets:

- Distance vector Routing Protocol: Distance vector is simple routing protocol which takes routing decision on the number of hops between source and destination.
- Link state routing protocol: Link State Protocol is slightly complicated protocol than Distance vector. It takes into account the states of links of all the routers in a network.

this technique helps routers build a common graph of the entire network. All routers then calculate their best path for routing purposes.

Ans. to the ques No - 7(c)

Ques: what are the multicast routing protocols?

Ans: Multicast Routing Protocols: unicast routing Protocols use graphs while multicast routing Protocols use graphs while multicast routing Protocol use graphs trees, ie spanning tree to avoid loops.

The optimal tree is called shortest path spanning tree.

- DV, MRP – Distance vector Multicast Routing Protocol.
- MOSPF – Multicast open shortest path first.
- CBT – Core Based Tree.

Ans to the ques No- 8(a)

ques: what are network layer ? point out the functionalities of layers 3.

Ans: the network layer is the third layer of OSI model. It handles the service request from the transport layer and further forwards the service request to the data link layer.

the main function performed by the network layer are.

- Routing: when a packate reaches the router's input link, the router will move the packats to the router's output link. For example, a packate from S1 to R1 must be forwarded to the next router on the path to S2.

Ans. to the ques No-8(b)

Ques: Describe the features of network layer.

Ans: With its standard functionalities, layer 3 can provide various features as.

Quality of service management.
Load balancing and link management.
Security
Interrelation of different protocols and subnets with different schema
Different logical network design over the physical network design.
L3 VPN and tunnels can be used to provide end to end dedicated connectivity.

Ans. to the ques No-8(c)

Q: what are the service provided by layer 3?

Ans:

* Guaranteed delivery: This layer provides the service which guarantees that the packet will arrive at its destination.

* Guaranteed delivery with bounded delay.: The service guaranteed that the packet will be delivered within a specified host-to-host delay bound.

* Guaranteed max jitter: This service ensures that the amount of time taken between two successive transmision at the sender in equal to the time between their recipt at the destination.

* Security services: This network layer provides security by using a session key.