CT Assignment - 03

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Answer no-01(a)

Discuss the similarity of OSI and TCP/IP reference model?

Solution: Similarities of TCP/IP and OSI model.

Similar architecture: Both of the model share ~~the~~ a similar architecture. This can be illustrated by the fact that both of them are constructed with layers.

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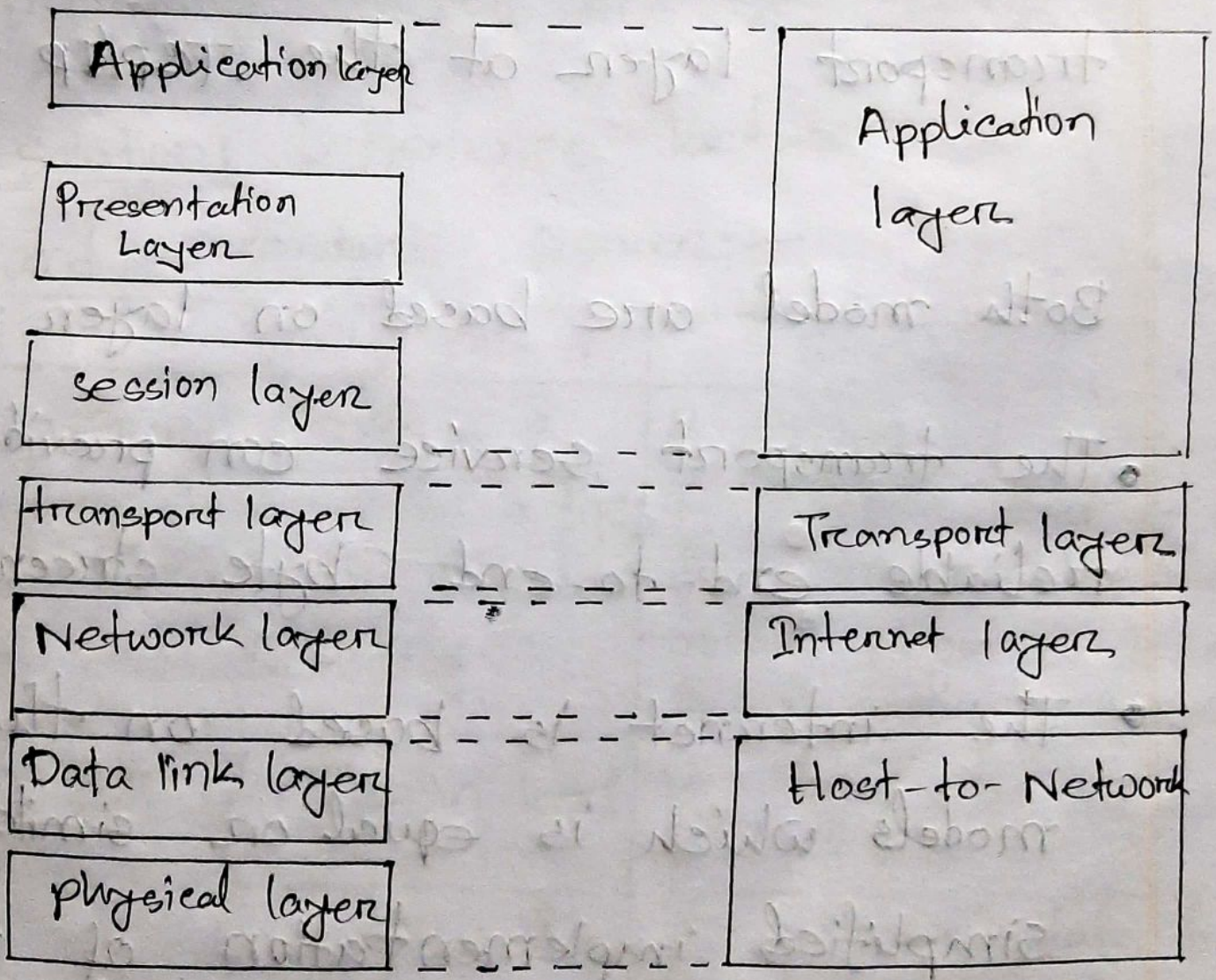
Share common Application layers: Both of the model share a common "Application layer". However this layer constain different source which depends upon each model.



OSI model TCP/IP model

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Both models have comparable "transport and Network layer; This can define by the facts that whatever "functions are perfor-ed between the presentation and netwo-rk layer of OSI model that similar or equal function are performed at the transport layer at the TCP/IP model.

Both model are based on layer protocols

- The transport service can provide a reliable end-to-end byte streem.
- The internet is based on the "TCP/IP models which is equal or similar simplified implementation of the OSI model.

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- The TCP/IP inspired by the OSI models.

Answer no-01(b)

What is the difference between a primary server and secondary server?

Solution: Difference between a primary and secondary server:-

Primary Server	Secondary Server
A primary server is a server that store a file about the zone for which it is an authority	A secondary server is a server that transfer the complete information about a zone from another server.
it stored file in local disk.	it stored file on its local zone.
it sends information to the secondary server	it received data from the primary server automatically.

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Answer no- 01(c)

What are the two main categories of DNS manage ?

Solution:

DNS have two types of manage

i) query
ii) Response.

Both have same format.

i) Query: The Query message consist of

- Header
- Questions records.

ii) Response: The response message consists of a

- Header
- Questions records

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- Answer records.
- Authoritative records and
- Additional records.

Answer no-01(d)

What are the three domain of domain name space in internet?

Solution: The three domain name space are-

i) Generic domain.
ii) country domain.
iii) Inverse domain.

Generic domain: (i) The generic domain defined registered hosts according to their generic behavior.

ii) each node in the tree defines a domain which is an indext to the

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domain name space database

Country domain:

i) The country domain section uses two characters - country abbreviation as us for united state.

ii) second levels can be organizational or they can be more specific national designition.

iii) The address anza.cup.ca.us can be translated to De anze college in cupertino, california, in the united state.

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iii) Inverse domain:

- The inverse domain is used to map on address to a name.
- This may happen for example, when a server has received a request from a client to do a task. Although the server has a file that contains a list authorized element.
- To handle a pointer query, the inverse domain is added to the domain name space with the first level node called arpa.
- The second level is also one single node named in-adds.
- The rest of the domain define IP address

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Answer no- 02(a)

What is mask in IPV4 addressing? you have a class A network address 10.0.0.0 with 40 students but are required to add 60 new student very soon. you would like to still allow for the largest possible number of host IPs per subnet. which subnet mask sould you assign?

Solution: mask also called the default mask a 32-bit number made of contigious 1s followed by contigious 0s

The mask for class A, B, C are shown below—

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class	Binary	Dotted decimal	CIDR
A	11111111 00000000 00000000 00000000 net id host id	255.0.0.0	/8
B	11111111 11111111 00000000 00000000 net id host id	255.255.0.0	/16
C	11111111 11111111 11111111 00000000 net id host id	255.255.255.0	/24

Here given that,

IP address = 10.0.0.0

and, subnet mask = 255.0.0.0

in Binary = 11111111 0000000 00000000 00000000
net id host id

total number of student = 40+60 = 100

we know that,

number of subnet where n is the number of mask on contigious (1) bits in the subnet mask = 2^n

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$\therefore \quad 2^n = 100$

$\Rightarrow \quad n = \log_2(100)$

$= 6.64$

$\cong 7$

$\therefore \quad n = 7$

that means 7 number are contigious 1 also the network address is in class A 1st octate is 255 (11111111) and 2nd octate is 1111110 where 1st 7 bits means netid and subnet no and last bit means the host. Then 3rd and 4th octate means the host id.

Now, we get,

Binary : 11111111 1111110 00000000 00000000

netid hostid

in decimal: 255.254.0.0

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∴ subnet mask: 255.254.0.0

we know,

no of host per subnet $= 2^n$ [where n host bit]

$= 2^{17}$

$= 131072$

no of usuable host per subnet $= 2^n - 2$

$= 2^{17} - 2$

$= 131070$

∴ number of usuable address per subnet $= 131070$

The subnet mask is = 255.254.0.0

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Answer no-02(b)

Explain why most of the address of in class A are wasted? Explain why a medium size or large size corporation does not want a block of C classes?

Solution: A block in class A address is too large for almost any organization. This means most of the address in class A are wasted and not used.

→ In 4 octate no, The 1st octate is the network id

→ In 4 octate no, the last 2.3.4 octate means the host id.

So, no of host $= 2^{24} = 16777216$ that are may large.

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→ Each block has usuable host $= 2^{24} - 2 = 16777214$ host.

Subnet mask : 255.0.0.0

A block in class C is probably too small for many organizations. so, it does not want to block.

→ In 4 octate, the last octate means the host id.

→ Number of Available host $= 2^8 = 256$

→ Number of usuable host $= 2^8 - 2 = 254$

→ Subnet mask : 255.255.255.0

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Answer no-03(a)

Why the protocols are needed? Why TCP is connected protocol? Explain with figure?

Solution: A protocol is a set of rules that govern data communications. A Protocol define what is communicated and how it is communicated and when it is communicated. The key elements of a protocols are syntax, semanties, Timing.

TCP is connected protocols: TCP is connection oriented in the sense that there is a connection establishment between the two ends where they may

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negotiate diffenent things. like congestion control mechanism among other things.

The transport layer protocols generall purpose is to provide A process-to-process delivery meaning that it doesnt know anythings about router; how your packets reach the end system beyond their scope, they are only concerned with how packets are being transmitted between two end process.

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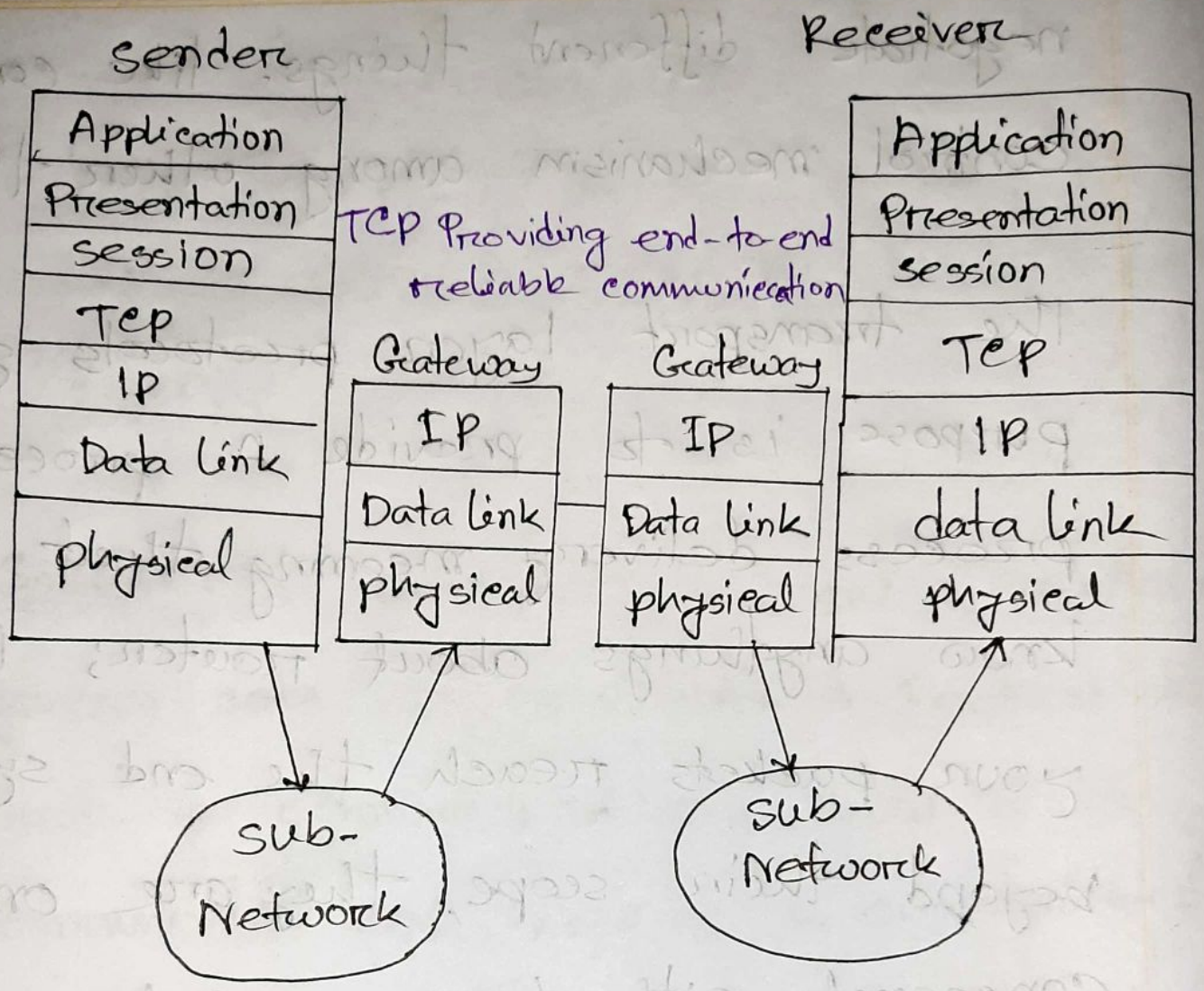

IP, on the other hand, the network layer protocol for the internet, is connected with data delivery between end-system yet, its connection less, it maintains no connection so, each packet is handled independently of the others packet.

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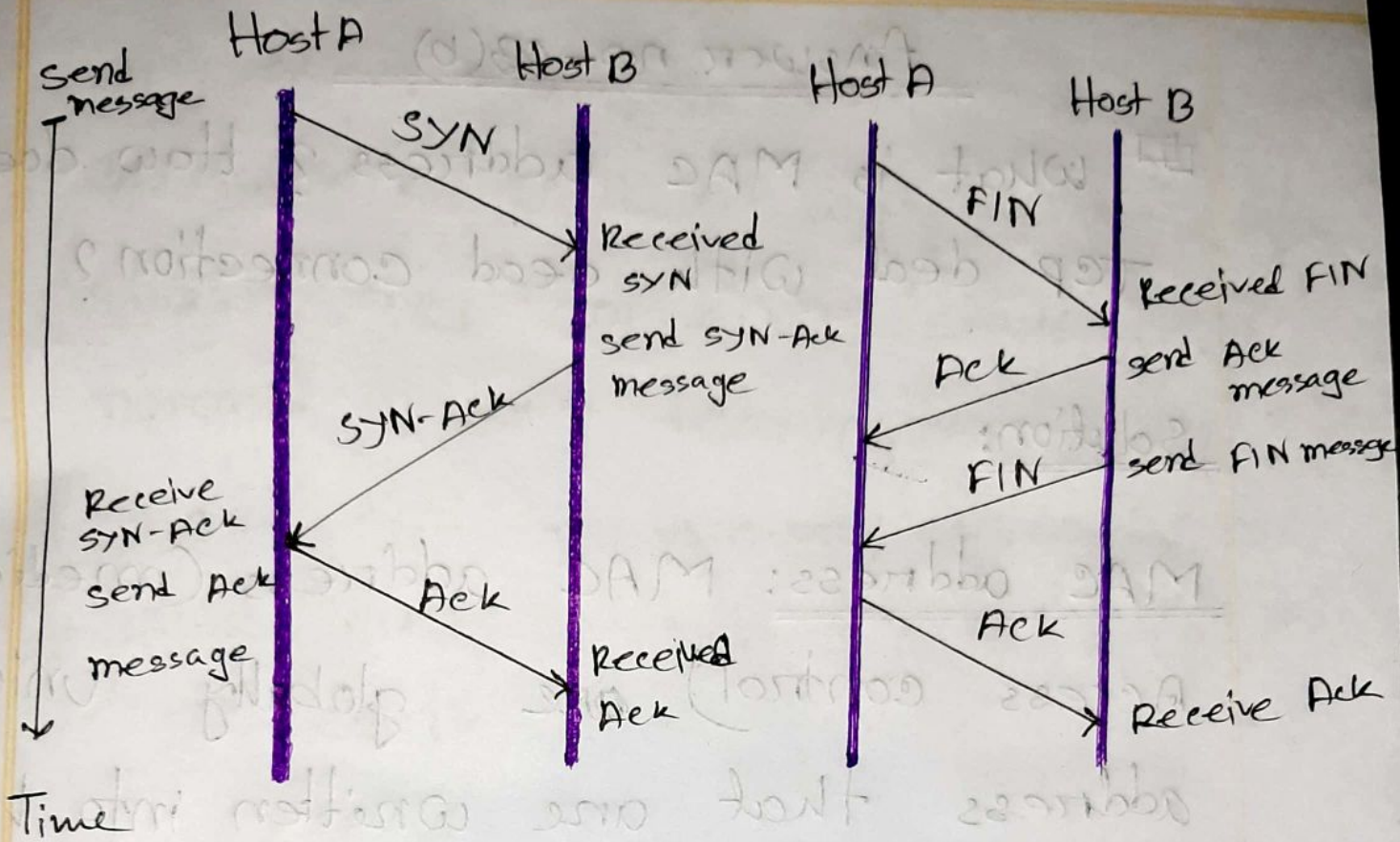

Tcp connection establishment

Tcp connection termination

fig: Tcp session establishment & Termination.

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Answer no-03(b)

What is MAC address? How does TCP deal with dead connection?

Solution:

MAC address: MAC address (media Access control) are globally unique address that are written into hardwere at the time of manufacture. The mac address is a unique value associated with a network adapter. MAC address are also known as hardwere address or physical address. The uniquely identify an adapter on a LAN. MAC address are 12 digit hexadecimal number (48 bits in length) or 6 bytes.

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Tips to handle peer death in TCP connection: After 3 way TCP handshake. TCP connection stays untill normal 2 way termination protocol or abort due to error cases. Error cases can be network ~~tt~~ issue or peer death.

Think of a simple TCP connection between peer A and peer B: there is the initial three ways handshake with one SYN segment from A to B, the SYN/ACK back from B to A, and the ACK from A to B. At this time we are in a stable status: connection is established and now we would normally wait for someone to send

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data over the channel. Let A is waiting data from B. Now unplay the power supply from B and instantly reboot. B it will shut down without sending anything over the network to notify A that the connection is going to be broken.

A from its side is ready to receive data and has no idea that B has crashed. Now, restare the power supply to B and wait for the system restart. A and B are now back again but while A knows about a connection still active with B, B has no idea. The situation resolves itself when A tries to send data to B

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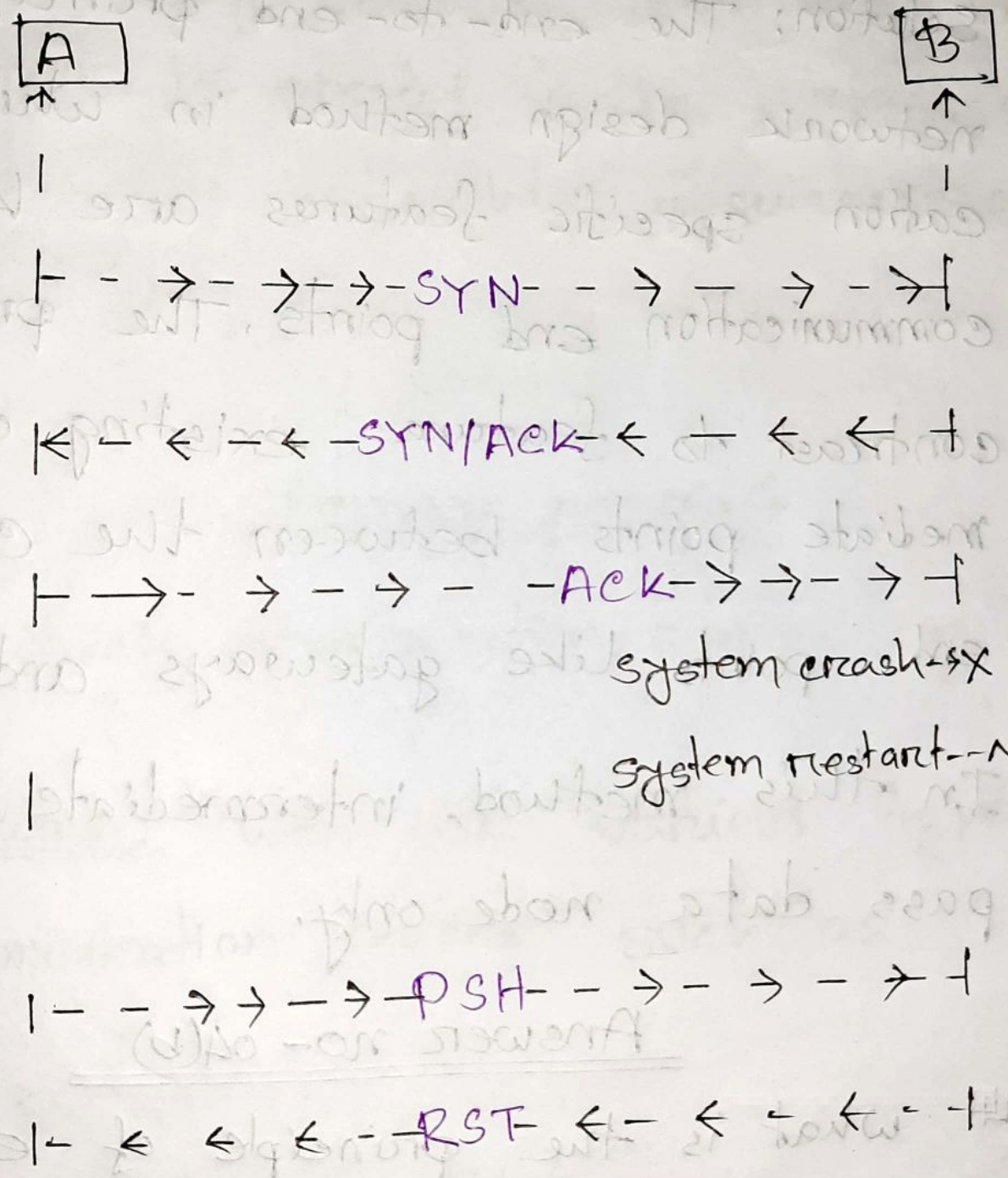
over the dead connection and B replies with an RST packet. causing A to finally to close the connection.



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Answer no- 04(a)

What is end-to-end principle?

Solution: The end-to-end principle is a network design method in which application specific features are kept at communication end points. The principle in contrast to feature existing on intermediate points between the client and end points like gateways and routers. In this method, intermediate nodes pass data node only.

Answer no- 04(b)

What is the principle of end-to-end communication?

Solution: The fundamental notion behind

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the end-to-end principle is that, for two process communication with each others via same communication means, the reliability obtained from that means cannot be expected to be perfectly aligned with the reliability requirments of the process.

Answer no-04(c)

Which communication series we use?

Solution: we use various types of communication series such as

i) Email
ii) social networking
iii) internet chat
iv) Discussion Board

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v) remote access.

Application servicess:

There are nothing but providing network based service to the users such as web service, database managing and resource sharing.

Resource sharing: To use resource efficient and economically network provides many of facilities by using them.

Database: This application service is one of the most important service

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Answer no- 05(a)

What is routing ?

Solution: Routing is the process of selecting a path for traffic in network or between or across multiple networks. Broadly, routing is performed in many types of networks, including circuit-switched networks, such as the public switched telephone network (PSTN) and computer network such as the internet

Answer no- 05(b)

Why do you use ping? ~~and trace route?~~

Solution:

Ping: The ping command is used to

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cheak network connectivity and host reachability. you can ping a device by using its IP address or device name, such as a computer name.

→ Figure: The following figure shows the ping process. After ~~the~~ you run the ping command an internet control message protocol (ICMP) echo request message immediately when receive the ICMP echo request message.

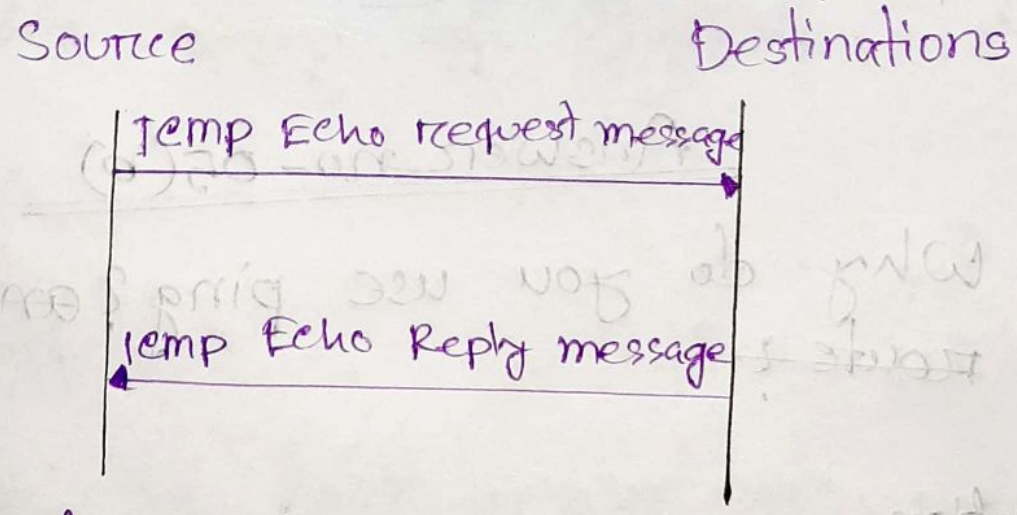

fig: principal of ping operation.

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→ pings tests IP reachability and status of the link between the source and the destinations by checking whether the destinations sends backs and ICMP ~~Re~~ Echo reply message and measuring the interval between sending the ICMP Echo message and receiving the ICMP Echo reply message.

Answer no- 05(c)

What is traceroute? Write about traceroute?

solution: In computing, traceroute and tracer are computer network diagonostic commands for displying possible route and measuring transit delays of

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packets across an internet protocol network

→ tracert also called trace route, is used to check the ip address and the number of gateways between the source and destinations.

→ tracert is helpful in testing network reachability location the fault of the network.

→ The S2700 implement tracert based on Icmp. Tracert records the gateways that the Icmp message passes along the path between source and destination.

→ in this manner you can check network connectivity and locate the fault.

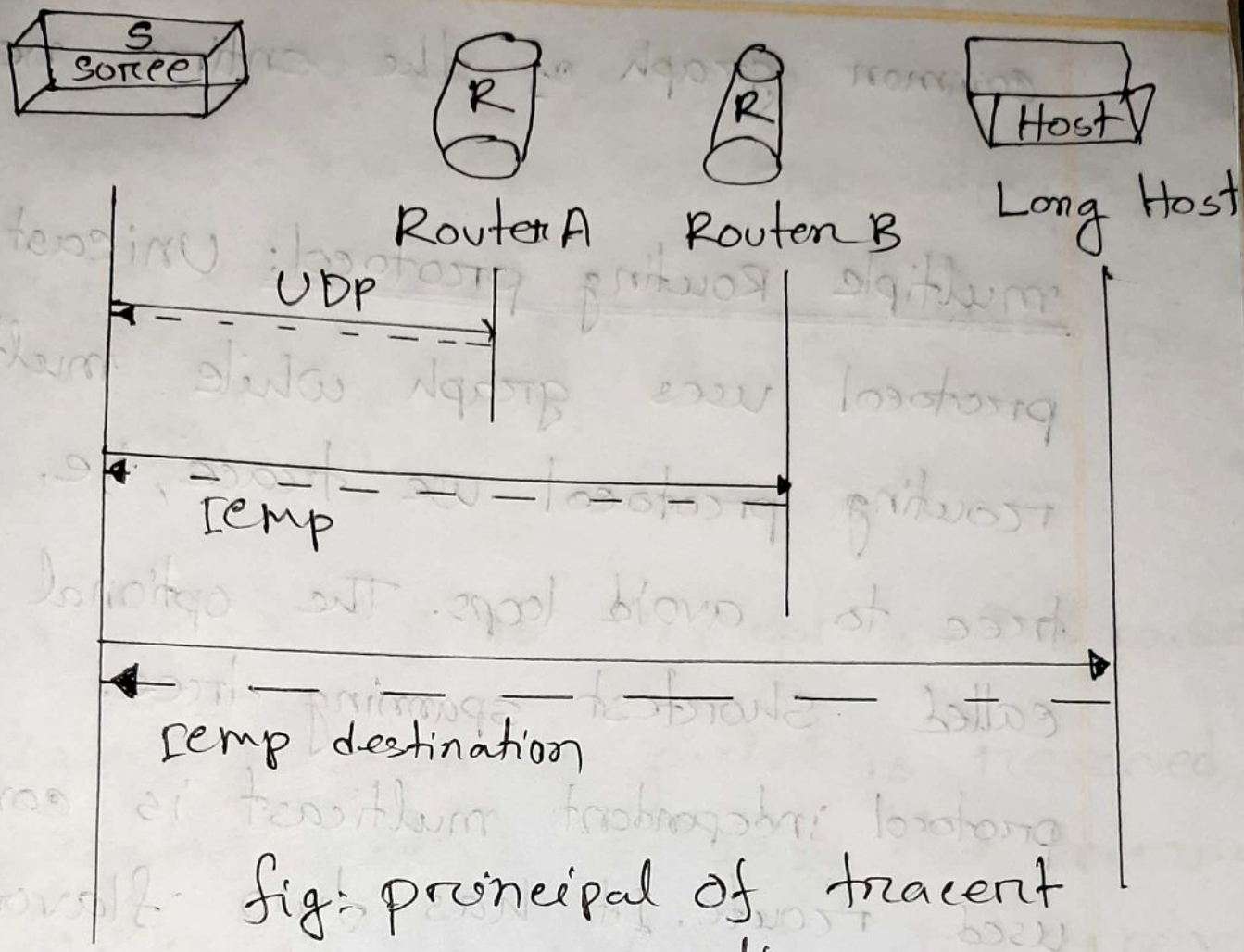

fig: principal of tracert operation.

Answer no- 07(a)

What is link state routing?

Solution: Link state routing protocol is slightly complicated protocol thats distance vector. It takes into account the state of links of all the routers in a network. This technique helps router build a

common graph of the entire network.

multiple Routing protocol: Unicast routing protocol uses graph while multicast routing protocol use trace, i.e. spanning tree to avoid loops. The optional tree is called shortest spanning tree.

protocol independent multicast is commonly used route. It has two flavors.

i) PIM dens mode: This mode uses source-based trees. it is used dense environment such as LAN.

ii) PIM spares mode: This mode uses shared trees. it is used space environment such as WAN.

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Answer no- 07(b)

Write down the routing algorithm.

Solution: The routing algorithm are as follows —

Flooding: Flooding is simplest method packet forwarding when a packet is received the routes send it to all ~~pa~~ the interface accept the one on which it was received This creates too much burden on the network and ~~to~~ lots of duplicate packets wandering in the network. Time to live (TTL) can be used to avoid infinite looping of packet. There exists another approach for flooding, which is called selection flooding to reduce to overhead on the network.

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shortest path: Routing decision in network are mostly taken on the basis of cost between source and destination. The count plays major role here shortest path is a technique which uses various algorithm to decide a path with minimum number of hops.

The common shortest path algorithm are-

i) Bellman ford algorithm

ii) Dijkstra algorithm

iii) floyed warshall algorithm.

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Answer no-07(c)

What is anycast Routing?

Solution: Anycast packet forwarding a mechanism where multiple hosts can have same logical address.

Answer no-08(a)

What is address resulation protocol?

Solution: address resulation protocol is a local level network protocol for translation network layer address into layer address.

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Answer no-08(b)

What is IPV4 resulation? How its works?

Solution: It is used when IPV4 used over ethernet the term address resulation refer to the process of finding an address of a computer in a network. The address is resolved using a protocol in which a piece of information is send by a client process executing on the local computer to a server process executing on a remote computer.

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Answer no- 02(c)

Draw the TCP/IP protocol suite and position the IPV4 in the suite. Define IPV4 and IPV6

Solution: The TCP/IP protocol suite developed prior to the OSI model.

→ The TCP/IP protocol suite maps to a four-layer conceptual model known as the DARPA model, which was named after the US government agency that innitially developed TCP/IP.

→ four layer of DARPA model are- application, transport, internet and network interface. Each layer in the DARPA corres-ponds to one or more layer in seven layer OSI model

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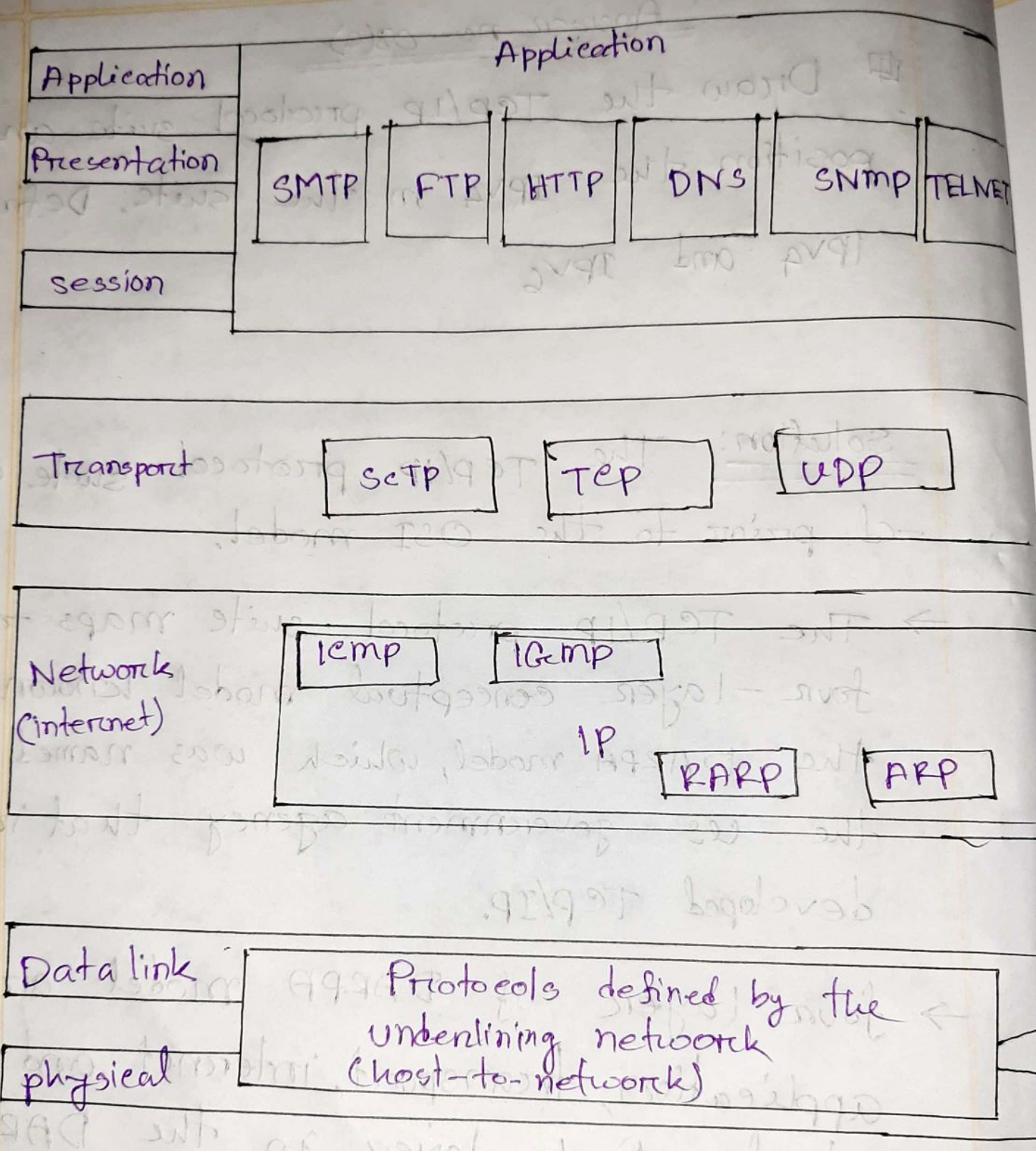

Fig: Architecture of TCP/IP protocol suite.

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