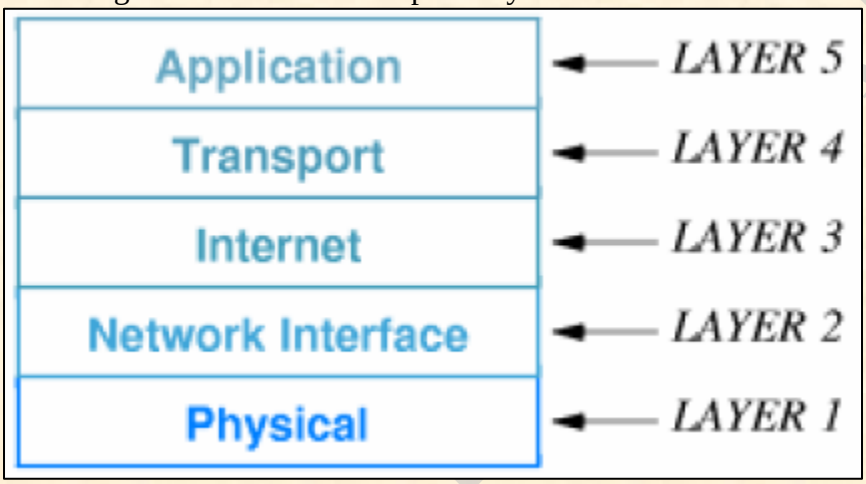
CS610 SOLVED FINALTERM CURRENT PAPER FALL 2021

1) Write Protocol types for TCP/IP & its layers. & TCP/IP refer to group of data communication protocol, you are required to write the name of transport protocol that work in TCP/IP based. & Write the name of internet protocol suit & its layers name too

TCP/IP contains two transport protocols:
1) UDP is the first of the transport protocols in TCP/IP protocol suite. UDP protocol allows applications on the computers to send and receive datagrams.
2) TCP is the major transport protocol in the TCP/IP suite. It uses unreliable datagram service offered by IP when sending data to another computer. It provides reliable data delivery service to applications.
TCP/IP protocols are organized into five conceptual layers.



2) Write Address Classes types

Class	Range of Values
A	0 through 127
B	128 through 191
C	192 through 223
D	224 through 239
E	240 through 255

3) Write Address Resolution techniques

ADDRESS RESOLUTION TECHNIQUES:
Address resolution algorithms can be grouped into three basic categories:
• Table lookup • Closed-form computation • Message Exchange

4) Write 5 Multicast address protocol types.

Multicast protocols:
Several multicast protocols exist. Some of the proposed protocols are:

1) Distance Vector Multicast Routing Protocol (DVMRP):
2) Core Based Trees (CBT):
3) Protocol Independent Multicast_ Sparse Mode (PIM-SM):
4) Protocol Independent Multicast _ Dense Mode (PIM-DM):
5) Multicast Extensions to the Open Shortest Path First Protocol (MOSPF):

5) 2 alg alg autonomous given thy, un mei just identify krna tha k kahn py EGP protocol use ho ga or kahn py IGP protocol.

INTERIOR GATEWAY PROTOCOLS (IGPs):
It is used among routers within autonomous system. The destinations lie within IGP.
EXTERIOR GATEWAY PROTOCOLS (EGPs):
It is used among autonomous systems. The destinations lie throughout Internet

6) End to end and computer to computer communication.

TRANSPORT PROTOCOLS:
• Provide application-to-application communication.
• Need extended addressing mechanisms to identify applications.
• Are called end-to-end communication.
The end-to-end principle is a design framework in computer networking. In networks designed according to this principle, guaranteeing certain application-specific features, such as reliability and security, requires that they reside in the communicating end nodes of the network.

7) What is Static & Dynamic Routing?

STATIC ROUTING: It is one of the forms of Internet routing. In Static routing, the table is initialized when system boots and there is no further changes.
DYNAMIC ROUTING: In dynamic routing the table is initialized when system boots. It includes routing software which learns routes and updates table.

8) Address resolution algorithm use krny thy, table lookup, Data exchange or closed form. Table mei data given tha bs aagy mention krna tha k ye kis algorithm se match krta ha

1. TABLE LOOKUP: In Table Lookup, binding or mapping is stored in a table in memory, which the software searches when it needs to resolve an address.
2. CLOSED-FORM COMPUTATION: In Closed-form computation, the protocol address assigned to a computer is chosen carefully so that computer's hardware address can be computed from the protocol address using basic Boolean and arithmetic operations.
3. MESSAGE EXCHANGE: In Message Exchange, Computers exchange messages across a network to resolve an address. One computer sends a message that requests an address binding (translation) and another computer sends a reply that contains the requested information.

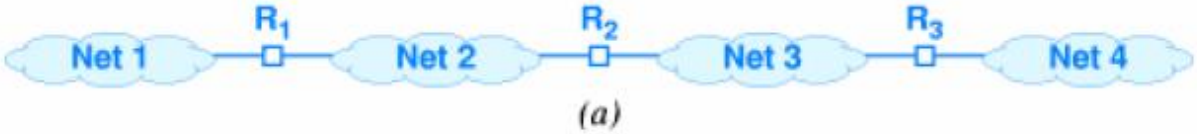
9) Value was given define class cidr notation.

CIDR NOTATION: Inside a computer, each address mask is stored as a 32-bit value. When we enter a prefix and an address mask they use a modified form of dotted decimal addressing called CIDR addressing, which is known as CIDR Notation.

As an example how CIDR adds flexibility, suppose a single class B prefix (e.g. 128.211.0.0) i.e. 216 host addresses 16-bit CIDR mask denoted as: 128.211.0.0/16

10) Routing ki next hope likhni thi

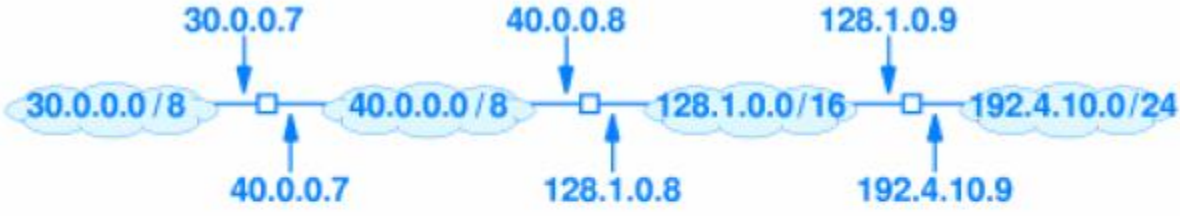
Idea Solution 1:



(a)

Destination	Next Hop
net 1	R_1
net 2	deliver direct
net 3	deliver direct
net 4	R_3

Idea Solution 2:



(a)

Destination	Mask	Next Hop
30.0.0.0	255.0.0.0	40.0.0.7
40.0.0.0	255.0.0.0	deliver direct
128.1.0.0	255.255.0.0	deliver direct
192.4.10.0	255.255.255.0	128.1.0.9

11) What is Sub-netting?

A subnet, or subnetwork, is a segmented piece of a larger network. More specifically, subnets are a logical partition of an IP network into multiple, smaller network segments. The Internet Protocol (IP) is the method for sending data from one computer to another over the internet.

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12) What is RIP & OSPF?

1) ROUTING INFORMATION PROTOCOL (RIP): "It is used for routing within an autonomous system (IGP). "It uses UDP for all message transmissions. "RIP is used over LAN. Version 1 of RIP uses hardware broadcast and version 2 allows delivery via multicast. "It uses distance vector algorithm. "RIP allows hosts to listen passively and update its routing table

2) THE OPEN SHORTEST PATH FIRST PROTOCOL (OSPF): As the internet grew in size, so did organizations. In particular, large ISPs appeared. To satisfy demand for a routing protocol that can scale to large organizations, the IETF devised an IGP known as the Open Shortest Path First Protocol (OSPF).

13) Write the name of MTU split technique

FRAGMENTATION: One technique is to limit datagram size to smallest MTU of any network. IP uses fragmentation i.e. datagrams can be split into pieces to fit in network with small MTU. Router detects datagram larger than network MTU and then it splits into pieces and each piece is smaller than outbound network MTU.

14) 2 column given thy, 2no side py data likha tha. Unko match kr k unko sai jga py likhna tha, column OSPF k bary mei tha

Idea Solution:
THE CHARACTERISTICS OF OSPF:
"ROUTING WITHIN AN AUTONOMOUS SYSTEM: OSPF has designed as an Interior Gateway Protocol used to pass routing information among routers within an autonomous system.
"FULL CIDR AND SUBNET SUPPORT: OSPF includes a 32-bit address mask with each address, which allows the address to be classful, classless, or subnetted.
"AUTHENTICATED MESSAGE EXCHANGE: A pair of routers using OSPF can authenticate each message to ensure that messages are only accepted from a trusted source.
"IMPORTED ROUTES: OSPF allows a router to introduce routes learned from another means (e.g., from BGP).
"LINK-STATE ALGORITHM: OSPF uses link-state routing.
"SUPPORT FOR MULTI-ACCESS NETWORKS: Traditional link state routing is inefficient across a multi-access network, such as an Ethernet, because all routers attached to the network broadcast link status. OSPF optimizes by designing a single router to broadcast on the network.

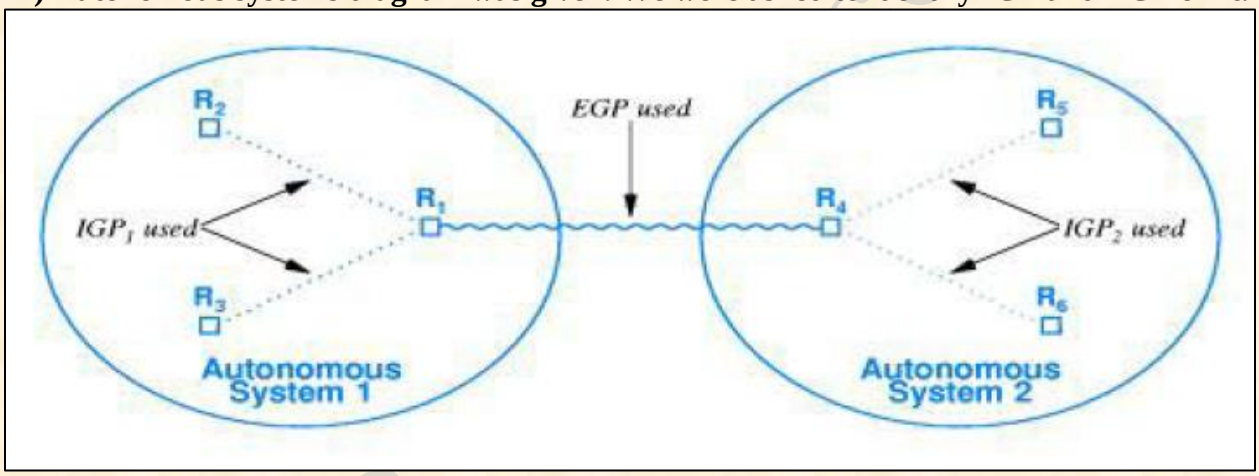
15) IP address 110.65.70.64/15**, find subnet mask, number of bits using for subneting, totoal useable address**

Idea Solution:
Suppose
D = Destination Address
(A, M)= (32-bit IP Address, 32-bit Address Mask)
A = = (D & M)
Now as an example consider a 32-bit mask:

11111111 11111111 00000000 00000000
Which can be denoted in dotted decimal as 255.255.0.0.
Consider a network prefix:
10000000 00001010 00000000 00000000
Which can be denoted in dotted decimal value as 128.10.0.0.
Consider a destination address: 128.10.2.3
That has Binary equivalent as:
10000000 00001010 00000010 00000011
A logical 'and' between D and M produces the binary result as:
10000000 00001010 00000000 00000000
Which is equal to prefix 128.10.0.0.

16) consider a larger scale computer network updates or change are made manually routing table. Write the name of that technique
Ans OSPF

17) Autonomous systems diagram was given. We were asked to identify IGP and EGP on it.



An Internet routing architecture is shown. Each autonomous system used to communicate among autonomous systems chooses an IGP to use

18) Routing diagram was given. We were to fill Routing table for R2 router. (5)

(a)

Destination	Next Hop
net 1	R_1
net 2	deliver direct
net 3	deliver direct
net 4	R_3

19) Name of the Connection-Oriented Service. (3)
ANS. TCP

20) Name of the Connection-Less Service. (3)
ANS. UDP

21) What is nat names of the alternatives of nat. (3)

NETWORK ADDRESS TRANSLATION: It is the extension of original addressing scheme and was motivated by exhaustion of IP address space. It allows multiple computers to share a single address. It requires device to perform packet translation. VPC Endpoints are a free alternative to NAT Gateway, but can only talk to S3 or DynamoDB.

22) 5 types of messages were given you have to find 3 informational messages

INFORMATIONAL MESSAGES:
These are as follows:
• Echo request/reply • Address mask request /reply • Router discovery