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Q: differentiate between IP and transport protocol with the help of example. **(2 Marks)**

Answer: - (Page 119)

1-IP provides computer-to-computer communication while TP provide application-to-application communication.

2-IP source and destination addresses are computers while TP need extended addressing mechanisms to identify applications

3-IP is also called machine-to-machine communication while TP are called end-to-end communication.

Q: Give the main advantage and disadvantage of RIP. **(2 Marks)**

Answer: - click here for detail

The biggest advantage of RIP is that it is simple to configure and deploy.

The biggest disadvantage of RIP is its inability to scale to large or very large networks. The maximum hop count used by RIP routers is 15.Another disadvantage of RIP is its high recovery time.

Q: Tel the first assignable IP address from a 128.140.80.24/20. **(2 Marks)**

Answer: - Click here for detail

The host address range for this subnet is 128.140.80.1 - 128.140.95.254, so the first assignable IP address is 128.140.80.1.

Q: how was the NAT implemented? **(2 Marks)**

Answer: - (Page 130)

We can see that the old and new values of IP source field and destination field are shown with their directions.

Direction	Field	Old Value	New Value
out	IP Source	10.0.0.1	128.10.24.6
in	IP Destination	128.10.24.6	10.0.0.1

NAT device stores state information in table. The value is entered in the table when NAT box receives outgoing datagram from new.

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Q: IS ATM including LAN and WAN network. If yes what kind of connection is established? (2 Marks)
Answer: - (Page 66)
Yes it includes LAN and WAN network and established connection-oriented connection.

Q: is IP multicasting beneficial? Defend your answer with proper reason. (3 Marks)
Answer: - Click here for detail
We assume that IP multicast is more beneficial for the channels with a high popularity, and therefore these channels will be preferred when the number of available multicast groups is smaller than the number of channels.

Q: Can the length of the segment be increased 500 meter by adding three repeater one with each segment. It can be done or not. (3 Marks)
Answer: (Page 49)
One repeater doubles, two repeaters triple the maximum cable length limitation. It is to be noted that we cannot increase the maximum cable length as many times as we wish by just adding repeaters.

Q: How an administrator can handle static and dynamic routing. (3 Marks)
Answer: - Click here for detail
Routing can be handled by a static routing table built by the system administrator. Static tables do not dynamically adjust to changing network conditions, so each change in the table is made manually by the network administrator.

Routing can be handled by a dynamic routing table that responds to changing network condition. Dynamic routing tables are built by routing protocols.

Q: IS TCP/IP suit including ARP. What kind of messages are in ARP. (3 Marks)
Answer: - (Page 97)
The TCP/IP protocol suite includes an Address Resolution Protocol (ARP).
The ARP standard defines two basic message types:
• Request
• Response

Q: Traceroute continues to increment the Time To Live until the value is large enough for the datagram to reach its final destination. What happens when the TTL is sufficiently large for the datagram to reach its destination? (3 Marks)
Answer: - Click here for detail
To learn when a datagram reaches its destination, traceroute sets the UDP destination port number in the datagram to a very large value that the destination host is unlikely to be using. When a host receives a datagram destined to it containing a destination port number that is unused locally, it sends an ICMP port-unreachable error to the source.

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Q: describe characteristics of BGP. **(5 Marks)**

Answer: - (Page 138)

It is most popular Exterior Gateway Protocol in Internet. It has following characteristics:

"It provides routing among autonomous systems (EGP).
"It provides policies to control routes advertised.
"It uses reliable transport (TCP).
"It gives path of autonomous systems for each destination.
"Currently the EGP is of choice in the Internet.
"The current version is four (BGP-4).
"It provides facilities for Transit Routing.

Q: describe IPV6 addressing notation. **(5 Marks)**

Answer: - (Page 114)

128-bit addresses unwisely in dotted decimal; requires 16 numbers:
105.220.136.100.255.255.255.255.0.0.18.128.140.10.255.255

Groups of 16-bit numbers in hex separated by colons – colon hexadecimal (or colon hex).
69DC: 8864:FFFF: FFFF: 0:1280:8C0A:FFFF

Zero-compression – series of zeroes indicated by two colons
FF0C: 0:0:0:0:0:0:B1
FF0C::B1

IPv6 address with 96 leading zeros is interpreted to hold an IPv4 address.

Q have there is a technique for achieving reliability through TCP. **(5 Marks)**

Answer: - (Page 123)

Reliability is the responsibility of the Transport layer. In TCP/IP, TCP provides reliable transport service. Most Internet applications use TCP as no other protocol has proved to work better.

SERVICE PROVIDED BY TCP:

Following are the services provided by TCP:

• Connection-oriented service
• Point-to-point
• Complete reliability
• Full-duplex communication
• Stream interface
• Reliable connection startup
• Graceful connection shutdown

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Is there any technique for achieving reliability through TCP? (5 Marks)
Answer: - rep

2. Give reasons for which IPv4 need to be changed? (5 Marks)
Answer:- (Page 110)
One of the parameters, which motivated IP for change, is address space. The 32-bit address space allows for over a million networks.

But most networks are class C and too small for many organizations. 214 class B network addresses already almost exhausted (and exhaustion was first predicted to occur, a couple of years ago).

The second parameter is type of service, the IP provides. Different applications have different requirements for delivery reliability and speed. Current IP has type of service that is not often implemented. Another factor for the motivation for change is multicast.

3. In a star organization there are 120 systems connected in a network. Give your comments about delay; delay should be smaller or larger. Give reasons? (5 Marks)

4. How TCP provides reliability? (3 Marks)
Answer: - (Page 125)
TCP achieves reliability by retransmission. An acknowledgement is used to verify that data has arrived successfully. If acknowledgement does not arrive, the previous data is retransmitted.

5. How TCP and IP interact with each other? (3 Marks)
Answer: - (Page 123)
TCP uses IP to carry messages. TCP message is encapsulated in IP datagram and sent to the destination. On the destination host, IP passes the contents to TCP. It is shown in the figure below.

6. Describe four factors for network classification? (2 Marks)
Answer: - (Page 4)
Computer networks are classified by four factors which are as follow:
1) BY SIZE:
2) BY CONNECTIVITY:
3) BY MEDIUM:
4) BY MOBILITY:

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Q1- What is ICMP and what type of errors internet layer can detect? **(5 Marks)**

Answer: - (Page115)

Internet control Message Protocol (ICMP) defines error and informational messages. These are given as follows:

1. ERROR MESSAGES:

These are as follows:

- Source quench
- Time exceeded
- Destination unreachable
- Redirect
- Fragmentation required

Q2- In which situation RIP support for default routers? **(5 Marks)**

Q3- Give Pros and Cons of static and Dynamic routing. **(5 Marks)**

Answer: - Click here for detail

Pros and Cons of Static Routing

- Static routing is not really a routing protocol. Static routing is simply the process of manually entering routes into a device's routing table via a configuration file that is loaded when the routing device starts up.
- Static routing is the simplest form of routing, but it is a manual process.
- Use static routing when you have very few devices to configure (<5) and when you know the routes will probably never change.
- Static routing also does not handle failures in external networks well because any route that is configured manually must be updated or reconfigured manually to fix or repair any lost connectivity.

Pros and Cons of Dynamic Routing

- Dynamic routing protocols are supported by software applications running on the routing device (the router) which dynamically learn network destinations and how to get to them and also advertise those destinations to other routers.
- A router using dynamic routing will 'learn' the routes to all networks that are directly connected to the device.
- Next, the router will learn routes from other routers that run the same routing protocol (RIP, RIP2, EIGRP, OSPF, IS-IS, BGP etc). Each router will then sort through it's list of routes and select one or more 'best' routes for each network destination the router knows or has learned.
- Dynamic routing protocols have the ability to adapt to logical network topology changes, equipment failures or network outages 'on the fly'.

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Q4- How ICMP used to test different tools? **(3 Marks)**

Answer:- (Page 117)

ICMP can also be used to test different tools. An Internet host A, is reachable from another host B, if datagrams can be delivered from A to B. Ping program tests reach ability. It sends datagram from B to A that echoes back to B. it uses ICMP echo request and echo reply messages. Internet layer includes code to reply to incoming ICMP echo request messages.

Q5 - How does host join and leave a group? **(3 Marks)**

Answer: - (Page 142)

A standard protocol exists that allows a host to inform a nearby router whenever the host needs to join or leave a particular multicast group known as Internet Group Multicast Protocol (IGMP). The computer uses IGMP to inform the local router about the last application when it leaves.

Q6- When packet lost what is the procedure TCP adopt? **(3 Marks)**

Answer: - Click here for detail

When a retransmitted TCP packet is lost (i.e., retransmission fails) most implementations do not have a mechanism to recover the packet without waiting for a retransmission time out and subsequent Slow Start. packet is lost for any reason, TCP adopts a sliding window approach, that is the sender keeps sending a few other packets even if it has not received the ACK for
the missing packet, in case the lost packet will arrive out of order

Q7- In this subnet blocks 192.168.1.0/26 What is the range of assignable host address? **(3 Marks)**

Q8 - Write the difference between Explicit and implicit frame type. **(3 Marks)**

Answer: - (Page 35)

In EXPLICIT FRAME TYPE the identifying value is included with frame describes types of included data while in implicit frame the receiver must infer from frame data.

Q9 - Give the concept of zero compression regarding IPV6. **(2 Marks)**

Answer: - (Page 114)

Zero-compression – series of zeroes indicated by two colons
FF0C: 0:0:0:0:0:0:B1
FF0C::B1

Q10 - Which technique is used for insertion and deletion in routing table. **(2 Marks)**

Answer: -

The search, insertion, and deletion operations can be finished in O(log N) time, where N is the number of prefixes in a routing table.

Q11- Can multiple IP addresses assigned or not on different interfaces of a router. **(2 Marks)**

Answer: - Click here for detail

You cannot have two different IP addresses from the same network assigned to the router.

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Q12- In which process backward compatibility of 100-base- T is done? (2 Marks)
Answer: (Page 47)
100Base-T technology is backward compatible and allows the participants to negotiate a speed when connection is established. This process is known as auto negotiation

Q13- Does OSPF only share information with an area or does it allow communication between different areas? (2 Marks)
Answer:- (Page 141)
OSPF allows subdivision of Autonomous System into areas. The link-status information is propagated within an area. The routes are summarized before being propagated to another area.

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What is the role of area in open shortest path first (OSPF)? (5 Marks)
Answer:- (Page 141)
OSPF allows subdivision of Autonomous System into areas. The link-status information is propagated within an area. The routes are summarized before being propagated to another area. It reduces overhead (less broadcast traffic). Because it allows a manager to partition the routers and networks in an autonomous system into multiple areas, OSPF can scale to handle a larger number of routers than other IGPs.

Compare IPv6 with IPv4. (5 Marks)
Answer: click here for detail

IPV4	IPV6
32 bits long (4 bytes).	128 bits long (16 bytes)
Unicast, multicast, and broadcast.	Unicast, multicast, and anycast.
You must configure a newly installed system before it can communicate with other systems	Configuration is optional, depending on functions required.
Variable length of 20-60 bytes, depending on IP options present.	Fixed length of 40 bytes. There are no IP header options
iSeries Navigator provides a complete configuration solution for TCP/IP.	Same for IPV6
RIP is a routing protocol supported by the routed daemon.	Currently, RIP does not support IPv6. IPv6 routing uses static routes.

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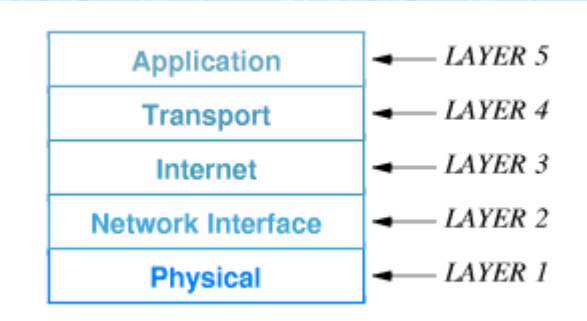
Transit routing. **(3 Marks)**
Answer: Click here for detail

A **routing transit number (RTN)** is a nine digit bank code, This code was designed to facilitate the sorting, bundling, and shipment of paper checks back to the drawer's (check writer's) account.

Are TCP/IP protocols organized into conceptual layers?
Answer:- (Page 83)
Yes, TCP/IP protocols are organized into five conceptual layers.



What is the size of the datagram header? **(3 Marks)**
Answer: (Page 102)

Datagram's can have different sizes i.e.

Header area is usually fixed (20 octets) but can have options. Data area can contain between 1 octet and 65.535 octets (216-1). Usually, data area is much larger than header

Can the length of an Ethernet be increased by adding a repeater? **(3 Marks)**
Answer: (Page 49)

One repeater doubles, two repeaters triple the maximum cable length limitation. It is to be noted that we cannot increase the maximum cable length as many times as we wish by just adding repeaters.

What is meant by client and server? **(2 Marks)**
Answer:- (Page 145)
It is used by all network applications. The passive program is called a server and the active program is called a client.

Zero comparison regarding IPv6. **(2 Marks)**
Answer:- rep

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1) Is bridge is intelligent? (2 Marks)
Answer:-
Yes, bridge is intelligent.

2) What is meant by Zero Compression in IPv6? (2 Marks)
Answer:- (Page 114)
Zero-compression – series of zeroes indicated by two colons
FF0C: 0:0:0:0:0:0:B1
FF0C::B1
IPv6 address with 96 leading zeros is interpreted to hold an IPv4 address.

3) Why three-way handshake technique is used by TCP? (3 Marks)
Answer:- (Page 127)
Part of the 3-way handshake used to create a connection, requires each end to generate a random 32-bit sequence number. If an application attempts to establish a new TCP connection after a computer reboots, TCP chooses a new random number.

4) IS TCP/IP suit include ARP. What kind of messages are in ARP. (3 Marks)
Answer:- rep

5) Traceroute continues to increment the Time To Live until the value is large enough for the datagram to reach its final destination. What happens when the TTL is sufficiently large for the datagram to reach its destination? 3 marks
Answer:- rep

6) Why we need server? (3 Marks)
Answer:- (Page 146)

- "It can handle multiple remote clients simultaneously.
- "It invoked automatically when system boots.
- "It executes forever.
- "It needs powerful computer and operating system.
- "It waits for client contact.
- "It accepts requests from arbitrary clients.

7) Difference b/w PIM-SM and PIM-DM (5 Marks)
Answer:- (Page 144)
PROTOCOL INDEPENDENT MULTICAST_ *SPARSE MODE (PIM-SM):*
This is a protocol that uses the same approach as CBT to form a multicast routing tree. The designers chose the term protocol independent to emphasize that although unicast datagrams are used to contact remote destinations when establishing multicast forwarding. PIM-SM does not depend on any particular unicast routing protocol.

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PROTOCOL INDEPENDENT MULTICAST _ *DENSE MODE (PIM-DM):*

A protocol designed for use within an organization. Routers that use PIM-DM broadcast (i.e. flood) multicast packets to all locations within the organization. Each router that has no member of a particular group sends back a message to prune the multicast routing tree ((i.e., a request to stop the flow of packets). The scheme works well for short-lived multicast sessions (e.g., a few minutes) because it does not require setup before transmission begins.

8) Describe NAT using at Home. **(5 Marks)**

Answer:- (Page 132)

NAT is useful at a residence with Cable Modem or DSL connectivity as it allows the customer to have multiple computers at home without requiring an IP address for each of them. Instead a single IP address is used for all the computers. NAT software allows a PC to connect with the Internet and act as a NAT device at the same time. It is shown in the figure below where multiple computers are connected to the dedicated hardware device implementing NAT.

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Why EGP not use routing metric??(5)

Answer:- Click here for detail

Although EGP is a dynamic routing protocol, it uses a very simple design. It does not use metrics and therefore cannot make true intelligent routing decisions. EGP routing updates contain network reachability information. In other words, they specify that certain networks are reachable through certain routers. Because of its limitations with regard to today's complex internetworks, EGP is being phased out in favor of routing protocols such as BGP.

how congestion control by tcp?(5)

Answer:- Click here for detail

When a TCP connection first begins, the Slow Start algorithm initializes a congestion window to one segment, which is the maximum segment size (MSS) initialized by the receiver during the connection establishment phase. When acknowledgements are returned by the receiver, the congestion window increases by one segment for each acknowledgement returned. Thus, the sender can transmit the minimum of the congestion window and the advertised window of the receiver, which is simply called the transmission window.

IPv6 addressing (5)

Answer:- (Page 114)

IPv6 uses 128-bit addresses. A 128-bit address includes network prefix and host suffix. An advantage of IPv6 addressing is that it has no address classes i.e. prefix/suffix boundary can fall anywhere.
Following are special types of addresses, IPv6 uses:
Unicast: It is used for single destination computer.
Multicast: It is used for multiple destinations; possibly not at same site.
Cluster: This type of address is used for collection of computers with same prefix; datagram is delivered to one out of cluster.

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define jitter (2)
Answer:- (Page 66)
Jitter is the term used for variance in transmission delays.
Jitter is significance for voice, video and data. In LANs, jitter can occur when a packet is delayed because the network is busy.

define TCP(2)
Answer:-
TCP (*Transmission Control Protocol*) is a set of rules (protocol) used along with the Internet Protocol (IP) to send data in the form of message units between computers over the Internet.

what is meant by the client server paradigm ?(2)
Answer:- (Page 145)
It is used by all network applications. The passive program is called a server and the active program is called a client.

how receiver knows incoming frame is id datagram (2)
Answer:
The sender and receiver must agree on the value used in the frame type field of the frame header in order to know the incoming frame contains an IP datagram.

transit routing (3)
Answer:- rep

why organization does not use single router(3)
Answer: (Page 82)
Organization seldom uses a single router to connect its entire network for two reasons.
• Because the router must forward each packet, the processor in a given router is insufficient to handle the traffic.
• Redundancy improved Internet reliability.

if there is no signal, how sever come to know there is communication arrived(3)

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Write a note on IPV6 Addressing. **(5 Marks)**
Answer:- rep

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What are the characteristics of UDP **(5 Marks)**

Answer:- (Page 120)

- It is an end-to-end protocol. It provides application-to-application communication.
- It provides connectionless service.
- It is a Message-Oriented protocol.
- It uses best-effort delivery service.
- It follows arbitrary interaction.
- It is operating system independent

What are multicast routing protocols? Give names of 5 of them. **(5 Marks)**

Answer:- (Page 145)

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

- DISTANCE VECTOR MULTICAST ROUTING PROTOCOL (DVMRP):
- CORE BASED TREES (CBT):
- PROTOCOL INDEPENDENT MULTICAST_ SPARSE MODE (PIM-SM):
- PROTOCOL INDEPENDENT MULTICAST _ DENSE MODE (PIM-DM):
- MULTICAST EXTENSIONS TO THE OPEN SHORTEST PATH FIRST PROTOCOL (MOSPF):
- CLIENT-SERVER INTERACTION:

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Distance Vector Routing **(2 Marks)**

Answer:- (Page 63)

Local information is next hop routing table and distance from each switch. The switches periodically broadcast topology information i.e. destination, distance. Other switches update routing table based on received information.

what stand for MTU, define **(2 Marks)**

Answer:- (Page 107)

Every hardware technology specification includes the definition of the maximum size of the frame data area, which is called the Maximum Transmission Unit (MTU).

why the Internet Multicast Routing is difficult **(2 Marks)**

Answer:- (Page 142)

Internet multicast routing is difficult because internet multicast allows arbitrary computer to join multicast group at any time. It allows arbitrary member to leave multicast group at any time.

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What the basic function of Twice NAT? **(2 Marks)**

Answer:- (Page 131)

Twice NAT is another variant of NAT. it is used with site that runs server. In this process NAT box is connected to Domain Name.

Difference between Static and Dynamic Routing **(3 Marks)**

Answer:- (Page 133)

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. In this way continuous changes are possible due to routing software.

How a receiver know that incoming data is datagram or other **(3 Marks)**

Answer:- rep

what is data stuffing **(3 Marks)**

Answer:- (Page 17)

In general to distinguish between data being sent and control information such as frame delimiters network systems arrange for the sending side to change the data slightly before it is sent because systems usually insert data or bytes to change data for transmission, the technique is known as Data Stuffing.

Message Oriented in UDP **(5 Marks)**

Answer:- (Page 120)

UDP offers application programs a Message-Oriented Interface. It does not divide messages into packets for transmission and does not combine messages for delivery.

Let's discuss its advantages and disadvantages.

ADVANTAGES:

• Applications can depend on protocol to preserve data boundaries.

DISADVANTAGES:

• Each UDP message must fit into a single IP datagram.

• It can result to an inefficient use of the underlying network.

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There are so many multicast protocol, Name only five one of those? (5 Marks)
Answer:- rep

What is Base Header in IPv6? (5 Marks)
Answer:- (Page 112)
Base header is fixed size i.e. 40 octets. NEXT HEADER field in the base header defines type of header and it appears at end of fixed-size base header. Some extension headers are variable sized. NEXT HEADER field in extension header defines type.

What is simple duplex and full duplex? (2 Marks)
Answer:- (Page 76)
Some connection-oriented technologies provide full duplex while other allow on simplex connection. To communicate using a simplex design a pair of computers must establish two connections one from computer A to computer B and another from computer B to A.

What is means by "It provides facilities for Transit Routing."? (2 Marks)
Answer:- Click here for Detail
Facilities For Transit Routing
classifies each AS as a transit system if it agrees to pass traffic through, or as a stub system if it does not BGP allows a corporation to classify itself as a stub even if it is multi-homed (refuse to accept transit traffic)

Does OSPF support for multi access network? (2 Marks)
Answer:- (Page 140)
Yes, OSPF supports for multi access network.

What is difference in NIC and CPU Processing? (3 Marks)
Answer:- (Page 40)
NIC contains sufficient hardware to process data independent of system CPU. In which some NICs contain separate microprocessor. In addition to this it also include analog circuitry interface to system bus, buffering and processing.

What is Extension Header in Ipv6? (3 Marks)
Answer:- (Page 111)
Additional information is stored in optional extension headers, followed by data.

How long TCP Should wait before retransmitting? (3 Marks)
Answer:- (Page 125)
The time for acknowledgement to arrive depends on:
• Distance to destination
• Current traffic conditions

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Multiple connections can be opened simultaneously. Traffic conditions change rapidly.

What is congestion control, How TCP Segment format is done? (3 Marks)
Answer: (Page 128)
Congestion control
The goal of congestion control is to avoid adding retransmissions to an already congested network. Reducing the window size quickly in response to the lost messages does it. It is assumed that loss is due to congestion.

TCP Segment format
TCP uses single format for all messages. TCP uses the term segment to refer to a message. Each message sent from TCP on one machine to TCP on another machine uses this format including data and acknowledgement.

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Question no. 31 (2 Marks)
Find the class in 00000001.001011.1001.111
Answer: (Page 87)
Class A

Question no. 32 (2 Marks)
What is the difference between unicast and multicast?
Answer:- (Page 114)
Unicast is used for single destination computer while multicast is used for multiple destinations

Question no. 33 (2 Marks)
What is the basic concept of Twice NAT (Network Address Translation)?
Answer:- rep

Question no. 34 (2 Marks)
What is the role of DMA in NIC?
Answer:- (Page 34)
It may use DMA to copy frame data directly from main memory and copy data directly into main memory.

Question no. 35 (2 Marks)
What is the function of Hope count matrix in routing information protocol?
Answer:- Click here for detail
RIP uses a hop count metric to measure the distance to a destination

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Question no. 36 (Marks2)
What is the scale or level of requirement in of IPv6?
Answer:- (Page 110)
Scale is also dramatically changed. Size from a few tens to a few tens of millions of computers has been revolutionized. Speed has increased from 56Kbps to 1Gbps. Also there is an increased frame size in hardware.

Question No: 37 (3 Marks)
Change the following into equivalent binary
154.31.161.13
202.32.15.7
192.168.1.5

154.31.161.13
Answer:
Binary: 10011010 00011111 10100001 00001101

202.32.15.7
Answer:
Binary: 11001010 00100000 00001111 00000111

192.168.1.5
Answer:
Binary: 11000000 10101000 00000001 00000101

Question No: 38 (3 Marks)
What is the meaning of Facilities for Transit Routing as a characteristic of the Border Gateway Protocol?
Answer:- Click here for Detail
Facilities For Transit Routing
classifies each AS as a transit system if it agrees to pass traffic through, or as a stub system if it does not BGP allows a corporation to classify itself as a stub even if it is multi-homed (refuse to accept transit traffic)

Question No: 39 (3 Marks)
In internet routing how does a host join or leave a group?
Answer:- rep

Question No: 40 (3 Marks)
Name the six services provided by TCP
Answer:- (Page 123)
Following are the services provided by TCP:
• Connection-oriented service
• Point-to-point
• Complete reliability

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• Full-duplex communication
• Stream interface
• Reliable connection startup
• Graceful connection shutdown

Question No: 41 (3 Marks)
In internet routing how does a host join or leave a group?
Answer:- rep

Question No: 42 (3 Marks)
What are the distance limitations in Fiber Optic?
Answer: Page 48
Optical fiber can extend across several kilometers because delays on optical fiber are very low and bandwidth is very high.

Question No: 43 (5 Marks)
What are the three approaches for datagram forwarding?
Answer:- (Page 143)
FLOOD-AND-PRUNE
CONFIGURATION-AND-TUNNELING
CORE-BASED DISCOVERY

Question No: 45 (5 Marks)
Write down the comparison of Distance- vector and Link – state algorithm?
Answer: Page 64

COMPARISON:
DISTANCE-VECTOR ROUTING:
• It is very simple to implement.
• Packet switch updates its own routing table first.
• It is used in RIP.
LINK-STATE ALGORITHM:
• It is much more complex.
• Switches perform independent computations.
• It is used in OSPF.

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Define simplex and full duplex connection? (2 Marks)
Answer:- rep

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What are the functions that the IP multicast abstraction allows an application running on an arbitrary computer to do? (2 Marks)

Answer: (Page 142)

It also allows arbitrary computer to send message to a group (even if not a member).

Give the address 130.4.102.1/24, find the number of subnet bits? (2 Marks)

What is the functionality of address resolution software in layering? (2 Marks)

Answer:- (Page 100)

Address resolution software hides ugly details and allows generality in upper layers.

Why we need the variants of NAT? Explain it with the proper reasons? (2 Marks)

Answer:- (Page 131)

Variants of NAT

The basic NAT simply changes IP addresses. But Network Address and Port Translation (NAPT) (which is another modified form of NAT) changes IP addresses and protocol port numbers too. It is the most popular form of NAT.

Twice NAT is another variant of NAT. it is used with site that runs server. In this process NAT box is connected to Domain Name.

What are some of the metrics used by routing protocols? (3 Marks)

Answer:- click here for detail

2 types of metrics used by routing protocols are:

-Hop count-this is the number of routers a packet must travel through to get to its destination

-Bandwidth-this is the "speed" of a link also known as the data capacity of a link

How ICMP can be used to test different tools? (3 Marks)

Answer:- rep

You are working in a Star organization as a network engineer. The existing network comprises of 120 systems. What will be your analysis about delay should it should be smaller or higher? Give reasons. (3 Marks)

ABC industry is using different network technologies in its branches. Can all branches communicate with each other? If No, then give reason? [3]

Which type of NAT fails if an application uses the IP addresses instead of domain name? And why? (3 Marks)

Answer:- (Page 132)

Twice NAT fails if an application uses the IP addresses instead of Domain Name. Because Basic NAT does not work well for communication initiated from the Internet. Twice NAT allows a site to run servers. It requires the DNS to interact with the NAT device.

What are the main advantages and disadvantages of routing information protocol (RIP)? (5 Marks)

Answer:- rep

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Network engineer has three address resolution methods. How many methods does TCP/IP support in a real environment? Write names of methods and support your answer with solid reason? (5 Marks)

Answer:-

Address resolution algorithms can be grouped into three basic categories:

• Table lookup
• Closed-form computation
• Message Exchange

TCP/IP can use any of the three address resolution methods depending on the addressing scheme used by the underlying hardware.

Have any technique used for achieving reliability in TCP? (5 Marks)

Answer:- rep

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Why EGP not use routing metric? (5 Marks)

Answer:- rep

What is the difference between an interior gateway protocol and an exterior gateway protocol? Name an example of each. (5 Marks)

Answer:- (Page 135)

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

As the Internet grew, the original Classful addressing scheme became a limitation, what is the designed solution. (5 Marks)

Answer:- (Page 90)

As the Internet grew, the original Classful addressing scheme became a limitation. The IP address space was being exhausted because all networks had to choose one of three possible sizes. Many addresses were unused. Two new mechanisms were invented to overcome the limitations, which are as follows:

• Subnet addressing
• Classless addressing

Instead of having three distinct address classes, allow the division between prefix and suffix to occur on an arbitrary boundary. The classless addressing scheme solves the problem by allowing an ISP to assign a prefix that is, 28 bits long (allowing the host to have up to 14 hosts).

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How can a datagram are transmitted across a physical network that does not understand the datagram format? (2 Marks)

Answer:- Click here for detail

When an IP datagram is encapsulated in a frame, the entire datagram is placed in the data area of a frame.

Describe the process of routing packets (2 Marks)

Answer:- Click here for detail

Routing is the act of moving information across an internet work from a source to a destination.

How ICMP can be used to trace a route? (2 Marks)

Answer:- (Page 118)

There are two possibilities used to detect the destination.

- Send and ICMP echo request, destination host will generate an ICMP echo reply.
- Send a datagram to a non-existent application, destination host will generate an ICMP destination unreachable message.

What is the basic concept of Twice NAT (Network Address Translation?) (2 Marks)

Answer:- rep

What is the scale or level of requirement in of IPv6? (2 Marks)

Answer:- rep

What are the three approaches for datagram forwarding? (3 Marks)

Answer:- rep

What are the some of the metrics used by routing protocols? (3 Marks)

How congestion control by TCP? (3 Marks)

Answer:- rep

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1: Limitations of parity checking? (2 mark)

Answer:- (Page 19)

Parity can only detect errors that change in odd number of bits for example the original data and parity is 10010001+1 (even parity) and the incorrect data is 10110011+1 (even parity). We see that even no. of bits have been changed due to noise so parity checking can not detect this error.

Parity usually is used to detect on bit error.

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2: how can we prove that we have 2,147,483,648 addresses in class A.? **(2 mark)**

Answer:- Click here for detail

In class A, only 1 bit defines the class.
The remaining 31 bits are available
for the address. With 31 bits,
we can have 231or 2,147,483,648 addresses

3: what is meant by the client server paradigm? **(2 mark)**

Answer:- rep

4: why is internet multicast routing difficult? **(2 mark)**

Answer:- rep

5: where should an ICMP message be sent? **(2 mark)**

Answer:- (Page 117)

ICMP message is sent in response to incoming datagrams with problems. ICMP message is not sent for ICMP message.

6: what is the basic concept of twice NAT? **(2 mark)**

Answer:- rep

7: what are the some of the metrics used by routing protocols? **(3 Marks)**

Answer:- rep

8: How can switch virtual network be established? **(3 Marks)**

Answer:- (Page 70)

Each pair of switches in the path communicates to choose a VPI/VCI for their tables. Once the connection is established by the destination, a message is sent back to the originating computer to indicate the SVC is ready. If any switch or the destination computer does not agree to setting up the VC, an error message is sent back and the SVC is not established.

9: Could IP be redesigned to use hardware addresses instead of the 32-bit addresses it currently uses. Why or why not? **(3 Marks)**

Answer:- Click here for detail

No, IP is not redesigned to use hardware addresses instead of32-bit addresses

- IP addresses must have a hierarchical format so, it supports the hierarchical routing
- Hardware addresses such as the 48-bit Ethernet addresses are chosen from a flat address space and have no provision for a “network address” to be used for Internet routing.

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10: Three features of dynamic message method in ARP. **(3 Marks)**
Answer:- (Page 97)

Feature	Type Of Resolution
Useful with any hardware	T
Address change affects all hosts	T
Protocol address independent of hardware address	T, D
Hardware address must be smaller than protocol address	C
Protocol address determined by hardware address	C
Requires hardware broadcast	D
Adds traffic to a network	D
Produces resolution with minimum delay	T, C
Implementation is more difficult	D

11: in internet routing how does a host join or leave a group? **(3 Marks)**
Answer:- rep

12: why TCP is called end to end protocol? **(3 Marks)**
Answer:- (Page 123)
It provides application-to-application communication.
Applications can request a connection. TCP connections are called Virtual Connections. They are created by software only. Internet does not provide software or hardware support for the connections. TCP software modules on two computers create an illusion of a connection.

13: If IPV4 works so well. Why change it? **(5 Marks)**
Answer:- rep

15: Main advantages and disadvantages of Routing Information Protocol. **(5 Marks)**
Answer:- rep

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Question No: 31 (Marks: 2)
Does OSPF only share information within area or does it allow communication between areas?
Answer:- rep

Question No: 32 (Marks: 2)
Define what is extension head in IPv6
Answer:- (Page 111)
Additional information is stored in optional extension headers, followed by data.

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Question No: 33 (Marks: 2)
What is implementation of NAT?
Answer:- rep

Question No: 34 (Marks: 2)
Which wireless standard is used in WIFI technology?
Answer:- (Page 29)
IEEE 802.11

Question No: 35 (Marks: 2)
How ICMP can be used to trace route?
Answer:- rep

Question No: 36 (Marks: 3)
Write a note on "limited connectivity" of Wireless LAN.
Answer:- (Page 29)
In contrast with wired LANs, not all participants may be able to reach each other Because:

- It has low signal strength.
- In wireless LANs the propagation is blocked by walls etc.
- It can't depend on CD to avoid interference because not all participants may hear.

Question No: 37 (Marks: 3)
In internet routing how can a host join or leave group?
Answer:- rep

Question No: 38 (Marks: 3)
Provide three characteristics of UDP?
Answer:- rep

Question No: 39 (Marks: 5)
What is meant by massage oriented interface in UDP also give the advantages and disadvantages of interface
Answer:- (Page 120)
UDP offers application programs a Message-Oriented Interface. It does not divide messages into packets for transmission and does not combine messages for delivery. Let's discuss its advantages and disadvantages.

ADVANTAGES:
• Applications can depend on protocol to preserve data boundaries.

DISADVANTAGES:
• Each UDP message must fit into a single IP datagram.
• It can result to an inefficient use of the underlying network

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Question No: 40 (Marks: 5)
What is the role of OSPF?
Answer:- rep

FINALTERM EXAMINATION

Fall 2008

CS610- Computer Network

Question No: 51 (Marks: 2)
How can we prove that we have 2,147,483,648 addresses in class A?
Answer: - rep

Question No: 52 (Marks: 2)
Why is internet multicast routing difficult?
Answer: - rep

Question No: 53 (Marks: 2)
Define what is the Extension Headers in IPv6.
Answer: - rep

Question No: 54 (Marks: 3)
How does IP software reassemble fragments that arrive out of order?
Answer:- (CS610 ref.Book Page 323)
When a packet is fragmented, the fragments must be numbered in such a way that the original data stream can be reconstructed. One way of numbering the fragments is to use a tree. If packet 0 must be split up, the pieces are called 0.0, 0.1, 0.2, etc. If these fragments themselves must be fragmented later on, the pieces are numbered 0.0.0, 0.0.1, 0.0.2. . . 0.1.0, 0.1.1, 0.1.2, etc. If enough fields have been reserved in the header for the worst case and no duplicates are generated anywhere, this scheme is sufficient to ensure that all the pieces can be correctly reassembled at the destination, no matter what order they arrive in.

Question No: 55 (Marks: 3)
What is the first address in the block if one of the addresses is 167.199.170.82/27?
Answer: - Click here for detail
Addressinbinary:10100111110001111010101001010010
Keeptheleft27bits:10100111110001111010101001000000
Result in CIDR notation:167.199.170.64/27

Question No: 56 (Marks: 3)
In internet routing how does a host join or leave a group?
Answer: - rep

Question No: 57 (Marks: 5)
Answer:- rep

Question No: 58 (Marks: 5)
Write a note on Address Resolution.
Answer:- (Page 93)
Mapping between a protocol address and a hardware address is called Address Resolution. A host or router uses address resolution when it needs to send a packet to another computer on the same physical network. A computer never resolves the address of a computer that attaches to a remote network.

In the figure below a simple Internet with routers R1 & R2 connecting three physical networks is shown each network has two host computers attached.

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Question No: 21 (Marks: 2)
Is there a comparison between TCP/IP reference model and ISO reference model?
Answer:- Click here for detail
The main differences between the two models are as follows:
TCP/IP combines the presentation and session layer issues into its application layer.
TCP/IP combines the OSI data link and physical layers into the network access layer.
TCP/IP appears to be a simpler model and this is mainly due to the fact that it has fewer layers.

Question No: 22 (Marks: 2)
Does OSPF only share information within an area or does it allow communication between areas?
Answer:- rep

Question No: 23 (Marks: 2)
What are the implementations of Network Address Translation?
Answer:- rep

Question No: 24 (Marks: 3)
Describe the difference between static and dynamic routing?
Answer:- rep

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Question No: 25 (Marks: 3)
What is the first address in the block if one of the addresses is 140.120.84.24/20?
Answer:-
The first address is140.120.80.0/20

Question No: 26 (Marks: 3)
Write three new features of IPV6.
Answer:- (Page 111)
• IPV6 addresses are 128 bits.
• Header format is entirely different.
• Additional information is stored in optional extension headers, followed by data.
• Flow label and quality of service allows audio and video applications to establish appropriate connections.
• New features can be added more easily. So it is extensible.

Question No: 27 (Marks: 5)
What is the difference between an interior gateway protocol and an exterior gateway protocol? Name an example of each.
Answer:- rep

Question No: 28 (Marks: 5)
As the Internet grew, the original Classful addressing scheme became a limitation, what is was the designed solution.
Answer:- rep

Question No: 29 (Marks: 5)
What is IPv6 ADDRESS NOTATION?
Answer:- rep

Question No: 30 (Marks: 10)
LIST SOME CHARACTERISTICS OF A CLIENT.
Answer:- (Page 145)
CHARACTERISTICS OF A CLIENT:
The characteristics of a client are explained below:

- "Client is an arbitrary application program.
- "It becomes client temporarily.
- "It can also perform other computations.
- "It is invoked directly by the user.
- "It runs locally on the user's computer.
- "It actively initiates contact with a server.
- "It contacts one server at a time.

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Question No: 21 (Marks:2)
Is there a comparison between TCP/IP reference model and OSI reference model?
Answer:- rep

Question No: 22 (Marks:2)
How can a datagram be transmitted across a physical network that does not understand the datagram format?
Answer:- rep

Question No: 23 (Marks:2)
What is the basic concept of Twice NAT (Network Address Translation)?
Answer:- rep

Question No: 24 (Marks:3)
What format is used for an internet packet?
Answer:- (CS610 ref.Book Page 37)
The internet layer defines an official packet format and protocol called IP (Internet Protocol). The job of the internet layer is to deliver IP packets where they are supposed to go.

Question No: 25 (Marks:3)
"To achieve a hierarchy, OSPF allows an autonomous system to be partitioned for routing purposes". Does this feature make OSPF more complex or powerful?
Answer:- Click here for detail
OSPF allows an autonomous system to be partitioned for routing purposes which make it complex but More powerful.

Question No: 26 (Marks:3)
Why does IPv6 use separate Extension Headers?
Answer:- (Page 113)
IPv6 use separate Extension Headers. Fragmentation information is kept in separate extension header. Each fragment has base header and (inserted) fragmentation header. Entire datagram including original header may be fragmented.

Question No: 27 (Marks:5)
Consider the IP addresses: 178.200.127.5 and the corresponding subnet masks 255.255.255.0, then find out the following:
a. The number of bits used for subnetting
b. Total number of host in the subnet
c. The network address of the subnet
d. The subnet address of the IP address.

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Answer:- Click here for detail

a. The number of bits used for subnetting

Answer

8 bits

b. Total number of host in the subnet

Answer

254

c. The network address of the subnet.

Answer

178.200.127.0

Question No: 28 (Marks:5)

How does IP software reassemble fragments that arrive out of order?

Answer:- rep

Question No: 29 (Marks:5)

Write down the comparison of Distance- vector and Link – state algorithm?

Answer:- (Page 64)

COMPARISON:

DISTANCE-VECTOR ROUTING:

• It is very simple to implement.

• Packet switch updates its own routing table first.

• It is used in RIP.

LINK-STATE ALGORITHM:

• It is much more complex.

• Switches perform independent computations.

• It is used in OSPF.

Question No: 30 (Marks:10)

Describe in detail what is the purpose of the following table? What sort of information can be extracted?

First Four Bits Of address	Table index in decimal	Class of Address
0000	0	A
0001	1	A
0010	2	A
0011	3	A
0100	4	A
0101	5	A
0110	6	A

0111	7	A
1000	8	B
1001	9	B
1010	10	B
1011	11	B
1100	12	C
1101	13	C
1110	14	D
1111	15	E

Answer:- (Page 87)

Whenever it handles a packet, IP software needs to separate the destination address into a prefix and suffix. Classful IP addresses are self-identifying because the class of the address can be computed from the address itself. The table shows in the figure above how the class of address can be computed.

Question No: 31 (Marks: 10)

List down and describe at least five characteristics of Routing Information Protocol.

Answer:- (Page 138)

ROUTING INFORMATION PROTOCOL (RIP):

It has the following characteristics:

"It is used for routing within an autonomous system (IGP).

"It uses UDP for all message transmissions.

"It can be used to advertise default route propagation. An organization can use RIP to install a default route in each router.

"It uses distance vector algorithm.

"RIP allows hosts to listen passively and update its routing table.