1. As system administrator, you type “debug ipx sap” and receive the following lines as part of the IOS response: type 0×4, “HELLO2″, 199.0002.0003.0006 (451), 2 hops type 0×4, “HELLO1″, 199.0002.0003.0008 (451), 2 hops What does “0×4″ signify?
   * That is a Get Nearest Server response.
   * That it is a General query.
   * That it is a General response.
   * That it is a Get Nearest Server request.
   Correct answer: **A**
2. To monitor IP igrp traffic, you can use “debug IP igrp transaction” or “debug IP igrp events”. How do you display information about IPX routing update packets?
   * debug routing
   * debug ipx transaction
   * debug ipx routing activity
   * debug ipx events
   Correct answer: **C**
3. To monitor ipx traffic on a network, what command would you use?
   * debug ipx transaction
   * show ipx traffic
   * show ipx events
   * display ipx traffic
   Correct answer: **B**
4. What command would you use to find out the names of Novell servers on a network?
   * show ipx servers
   * show ipx hosts
   * show ipx sap
   * show ipx nodes.
   Correct answer: **A**
5. The “ipx delay number” command will allow an administrator to change the default settings. What are the default settings?
   * For LAN interfaces, one tick; for WAN interfaces, six ticks
   * For LAN interfaces, six ticks; for WAN interfaces, one tick
   * For LAN interfaces, zero ticks; for WAN interfaces, five ticks
   * For LAN interfaces, five ticks; for WAN interfaces, zero Ticks
   Correct answer: **A**
   The default is–for LAN interfaces, one tick; for WAN interfaces, six ticks
6. As a system administrator, you need to set up one Ethernet interface on the Cisco router to allow for both sap and Novell-ether encapsulations. Which set of commands will accomplish this?
   * interface ethernet 0.1 ipx encapsulation Novell-ether ipx network 9e interface ethernet 0.2 ipx network 6c
   * interface ethernet 0 ipx encapsulation Novell-ether ipx network 9e interface ethernet 0 ipx encapsulation sap ipx network 6c
   * interface ethernet 0.1 ipx encapsulation Novell-ether interface ethernet 0.2 ipx encapsulation sap
   * interface ethernet 0.1ipx encapsulation Novell-ether ipx network 9e interface ethernet 0.2 ipx encapsulation sap ipx network 6c
   Correct answer: **D**
   The following commands setup the subinterfaces to allow for two types of encapsulation: interface ethernet 0.1 ipx encapsulation Novell-ether ipx network 9e interface ethernet 0.2 ipx encapsulation sap ipx network 6c
7. What does the “IPX maximum-paths 2″ command accomplish?
   * It enables load sharing on 2 paths if the paths are equal metric paths.
   * It sets up routing to go to network 2.

* It is the default for Cisco IPX load sharing.
* It enables load sharing on 2 paths if the paths are unequal metric paths.

Correct answer: **A**

It enables load sharing on 2 paths if the paths are equal metric paths. The default is 1 path and the maximum is 512 paths.

8. You want to enable both arpa and snap encapsulation on one router interface. How do you do this?
   * The interface can handle multiple encapsulation types with no extra configuration.
   * Assign two network numbers, one for each encapsulation type.
   * Enable Novell-ether to run multiple encapsulation types.
   * Both arpa and snap are enabled by default so you don't have to configure anything.

   Correct answer: **B**

   To assign multiple network numbers, you usually use subinterfaces. A sample configuration follows: ipx ethernet 0.1 ipx encapsulation novell-ether ipx network 9e interface ethernet 0.2 ipx encapsulation sap ipx network 6c

   By default, Cisco routers forward GNS SAPs to remote networks.
   * False
   * True

   Correct answer: **A**

   GNS is Novell's protocol to Get Nearest Server. If there is a server on the local network, that server will respond. If there isn't, the Cisco router has to be configured to forward the GNS SAP.
9. To prevent Service Advertisements (SAPs) from flooding a network, Cisco routers do not forward them. How are services advertised to other networks?
   * Each router builds its own SAP table and forwards that every 60 seconds.
   * Each router assigns a service number and broadcasts that.
   * SAPs aren't necessary with Cisco routers.
   * Cisco routers filter out all SAPs.

   Correct answer: **A**

   Cisco routers build SAP tables and forward the table every 60 seconds. All SAPs can't be filtered even with 4.x since NDS and time synchronization uses SAPs.
10. Novell's implementation of RIP updates routing tables every ____ seconds.
    * 60
    * 90
    * 10
    * 30

    Correct answer: **A**

    Novell's RIP updates routing tables every 60 seconds, Apple's RTMP is every 10 seconds, routers ARP every 60 seconds, IGRP signal every 90 seconds, and Banyan VINES signals every 90 seconds.
11. In Novell's use of RIP, there are two metrics used to make routing decisions. Select the two metrics.
    * Ticks.
    * Hops
    * Loops
    * Counts

    Correct answer: **A &B**

    It first uses ticks (which is about 1/18 sec.); if there is a tie, it uses hops; if hops are equal, then it uses an administratively assigned tiebreaker.
12. What is the Cisco name for the encapsulation type used on a serial interface?
    * HDLC
    * SDLC
    * SAP

* SNAP
Correct answer: **A**

13. "arpa" is used by the Cisco IOS for which encapsulation types?
    * Ethernet_II
    * Ethernet_802.3
    * Ethernet_802.2
    * Ethernet_SNAP
    Correct answer: **A**
14. Novell's IPX and Cisco's IOS name their protocols differently. Cisco uses sap for Ethernet_802.2, Token-Ring, and Novell's FDDI_802.2. Cisco uses snap for Ethernet_SNAP, Token-Ring_SNAP, and FDDI_SNAP. Cisco uses arpa for Ethernet_II and, finally the default is Novell-ether for Novell's Ethernet_802.3. "snap" is used by the Cisco IOS for which encapsulation types?
    * Ethernet_SNAP
    * Token-Ring_SNAP
    * FDDI_SNAP
    * Novell-SNAP
    * Novell-FDDI.
    Correct answer: **A,B &C**
15. Novell's IPX and Cisco's IOS name their protocols differently. Cisco uses sap for Ethernet_802.2, Token-Ring, and Novell's FDDI_802.2. Cisco uses snap for Ethernet_SNAP, Token-Ring_SNAP, and FDDI_SNAP. Cisco uses arpa for Ethernet_II and, finally the default is Novell-ether for Novell's Ethernet_802.3.15 "sap" is used by the Cisco IOS for which encapsulation types?
    * Ethernet_802.2
    * Token-Ring
    * FDDI_SNAP
    * Ethernet_802.3
    * FDDI_802.2
    Correct answer: **A,B &E**
16. Novell's IPX and Cisco's IOS name their protocols differently. Cisco uses sap for Ethernet_802.2, Token-Ring, and Novell's FDDI_802.2. Cisco uses snap for Ethernet_SNAP, Token-Ring_SNAP, and FDDI_SNAP. Cisco uses arpa for Ethernet_II and, finally the default is Novell-ether for Novell's Ethernet_802.3. Which type of Ethernet framing is used for TCP/IP and AppleTalk?
    * Ethernet 802.3
    * Ethernet 802.2
    * Ethernet II
    * Ethernet SNAP
    Correct answer: **D**
    Ethernet 802.3 is used with NetWare versions 2 through 3.11, Ethernet 802.2 is used with NetWare 3.12 and later plus OSI routing, Ethernet II is used with TCP/IP and DECnet, and Ethernet SNAP is used with TCP/IP and AppleTalk.
17. Which type of Ethernet framing is used for TCP/IP and DECnet?
    * Ethernet 802.3
    * Ethernet 802.2
    * Ethernet II
    * Ethernet SNAP
    Correct answer: **C**
    Ethernet 802.3 is used with NetWare versions 2 through 3.11, Ethernet 802.2 is used with NetWare 3.12 and later plus OSI routing, Ethernet II is used with TCP/IP and DECnet, and Ethernet SNAP is used with TCP/IP and AppleTalk.

18. You are a system administrator on a NetWare network, you are running NetWare 4.11 and you cannot communicate with your router. What is the likely problem?
    * NetWare 4.11 defaults to 802.2 encapsulation.
    * NetWare 4.11 defaults to 802.3 encapsulation
    * Cisco routers only work with NetWare 3.11.
    * NetWare 3.11 defaults to 802.2 encapsulation.
    Correct answer: **A**
    The default encapsulation on Cisco routers is Novell Ethernet_802.3 and NetWare 3.12 and later defaults to 802.2 encapsulation, 3.11 and earlier defaults to 802.3.
19. NetWare IPX addressing uses a network number and a node number. Which statements are true?
    * The network address is administratively assigned and can be up to 16 hexadecimal digits long.
    * The node address is always administratively assigned.
    * The node address is usually the MAC address.
    * If the MAC address is used as the node address, then IPX eliminates the use of ARP.
    Correct answer: **A, C &D**
    The network address can be up to 16 hexadecimal digits in length. The node number is 12 hexadecimal digits. The node address is usually the MAC address. An example IPX address is 4a1d.0000.0c56.de33. The network part is 4a1d. The node part is 0000.0c56.de33. The network number is assigned by the system administrator of the Novell network.
20. Which NetWare protocol works on layer 3–network layerÃ¢â‚¬â€öof the OSI model?
    * IPX
    * NCP
    * SPX
    * NetBIOS
    Correct answer: **A**
    IPX (Internetwork Packet Exchange) is a NetWare network layer 3 protocol used for transferring information on LANs.
21. Which NetWare protocol provides link-state routing?
    * NLSP
    * RIP
    * SAP
    * NCP
    Correct answer: **A**
    NetWare Link Services Protocol (NLSP) provides link-state routing. SAP (Service Advertisement Protocol) advertises network services. NCP (NetWare Core Protocol) provides client-to-server connections and applications. RIP is a distance vector routing protocol.
22. As a system administrator, you want to debug igrp but are worried that the “debug IP igrp transaction” command will flood the console. What is the command that you should use?
    * debug IP igrp event
    * debug IP igrp-events
    * debug IP igrp summary
    * debug IP igrp events
    Correct answer: **D**
    The “debug IP igrp events” is used to only display a summary of IGRP routing information. You can append an IP address onto either command to see only the IGRP updates from a neighbor.

23. What does the following series of commands accomplish? router igrp 71 network 10.0.0.0 router igrp 109 network 172.68.7.0
    * It isolates networks 10.0.0.0 and 172.68.7.0.
    * It loads igrp for networks 109 and 71.
    * It disables RIP.
    * It disables all routing protocols.
    Correct answer: **A**
    It isolates network 10.0.0.0 and 172.68.7.0 and associates autonomous systems 109 and 71 with IGRP. IGRP does not disable RIP, both can be used at the same time.
24. In the command "router igrp 109″ what does 109 signify?
    * an autonomous system
    * any network number which the router is attached to
    * the allowable length of the routing table
    * the network socket number
    Correct answer: **A**
    The Cisco IOS global configuration command "router igrp xxx" is used to configure the Interior Gateway Routing Protocol. In this case, the 109 is called the process-id , which can also be used for an autonomous system number.
25. IGRP supports a feature that allows traffic to be distributed among up to 6 (4 default) paths to provide greater overall throughput and reliability. What is this called?
    * unequal-cost load balancing
    * equal-cost load balancing
    * proportionate load balancing
    * low cost load balancing
    Correct answer: **A**
    An unequal-cost load balancing is used to provide alternate paths for data distribution on an internetwork. Cisco developed this method to use unused or under utilized links to increase bandwidth and network availability.
26. IGRP uses flash updates, poison reverse updates, holddown times, and split horizon. How often does it broadcast its routing table updates?
    * 90 seconds
    * 10 seconds
    * 30 seconds
    * 45 seconds
    Correct answer: **A**
27. The command "show IP protocol" displays which information?
    * routing timers
    * network information
    * contents of the IP routing table
    * information about all known network and subnetworks
    Correct answer: **A & B**
    "show IP protocol" displays routing timers and network information. "show IP route" displays the routing table with information about all known networks and subnetworks.
28. When using RIP, routing updates are broadcast every ____ seconds.
    * 30
    * 10
    * 60
    * 90
    Correct answer: **A**
    Novell's RIP updates routing tables every 60 seconds, Apple's RTMP is every 10 seconds, routers ARP every 60 seconds, DECnet hosts and IGRP signal every 15 seconds, and Banyan VINES signals every 90 seconds.

29. An autonomous system can only exist if all routers in that system meet which criteria?
    * interconnected
    * run the same routing protocol
    * assigned same autonomous system number
    * run IGRP only
    * run RIP only
    Correct answer: **A,B &C**
    An autonomous system is a set of routers and networks under the same administration. Each router must be interconnected, run the same routing protocol, and assigned the same autonomous system number. The network Information Center (NIC) assigns a unique autonomous system number to enterprises.
30. A default route is analogous to a _____.
    * default gateway
    * static route
    * dynamic route
    * one-way route
    Correct answer: **A**
    A default route is analogous to a default gateway. It is used to reduce the length of routing tables and to provide complete routing capabilities when a router might not know the routes to all other networks.
31. Routers can learn about destinations through static routes, default, or dynamic routing. By default, a router will use information derived from _____.
    * IGRP
    * RIP
    * IP
    * TCP
    Correct answer: **A**
    The quality of information is rated:
    Connected interface 0
    Static route 1
    IGRP 100
    RIP 120
    Unknown 255
    The lower the value, the more reliable the source with 255 signifying information that the router will ignore. So, the router will use IGRP, rated at 100, before RIP, rated at 120.
32. You are logged into a router, what command would show you the IP addresses of routers connected to you?
    * show cdp neighbors detail
    * show run
    * show neighbors
    * show cdp
    Correct answer: **A**
33. As a system administrator, you perform an extended ping at the privileged EXEC prompt. As part of the display, you see “Set DF bit in IP header? [yes] :” What would happen if you answered no at the prompt.
    * This lets the router fragment the packet.
    * It tells the router not to fragment the packet.
    * This lets the router direct the packet to the destination it finds in its routing table.
    * It tell the router to send the packet to the next hop router
    Correct answer: **A**
    “Set DF bit in IP header?” is a response to an extended ping at the router. If you

answer yes (the default) the router will not fragment the packet. If you answer no, the router will fragment the packet.

34. You have typed “ping” 172.16.101.1 and get the following display: Type escape sequence to abort. Sending 5, 100-byte ICMP Echoes to 172.16.101.1, timeout is 2 seconds:
.!!!!
What does the “.” signify?
* That one message timed out.
* That all messages were successful.
* That one message was successful.
* That one message completed in under the allotted timeframe.
Correct answer: **A**
The possible responses from the ping command are: ! Successful receipt of an echo reply. Timed out waiting for a reply U Destination unreachable C Congestion-experienced packet I Ping interrupted ? Packet type unknown & Packet TTL exceeded
35. Which command, that is used to test address configuration, uses Time-To-Live (TTL) values to generate messages from each router.
* trace
* ping
* telnet
* bootp
Correct answer: **A**
The Cisco IOS EXEC command “trace [protocol] [destination]” is used to discover routes that packets will travel to their destination hosts. Trace uses TTL (Time to Live) values to report destination route information.
36. What does the command “IP name-server 255.255.255.255″ accomplish?

* It sets the domain name lookup to be a local broadcast.
* This is an illegal command.
* It disables domain name lookup.
* The command is now defunct and has been replaced by “IP server-name ip any”
Correct answer: **A**
By default DNS is enabled on a router with a server address of 255.255.255.255, which provides for a local broadcast.

37. As a system administrator, you need to provide your routers with a Domain Name System (DNS) server. How many DNS servers can you specify with one command?
* 6
* 1
* 2
* 4
Correct answer: **A**
You can only specify six name servers in one command. The syntax is “IP name-server server-address1 [[server-address2]…server-address6]. You must also enable DNS.
38. How would you configure one host name that points to two IP addresses?
* IP host jacob 1.0.0.5 2.0.0.8
* IP jacob 1.0.0.5 2.0.0.8
* IP host jacob 1.0.0.5
* IP host duplicate “all”
Correct answer: **A**
The correct syntax is IP host name [TCP-port-number] address [address]….. So,

"IP host P1R1 1.0.0.5 2.0.0.8″ is the correct choice. "IP host jacob 1.0.0.5″ only points the host name jacob to one IP address–1.0.0.5.

39. The following selections show the command prompt and the configuration of the IP network mask. Which two are correct?
    * Router#term IP netmask-format { bitcount | decimal | hexadecimal }
    * Router(config-if)#IP netmask-format { bitcount | decimal | hexadecimal }
    * Router(config-if)#netmask-format { bitcount | decimal | hexadecimal }
    * Router#ip netmask-format { bitcount | decimal | hexadecimal }

    Correct answer: **A & B**

    Router#term IP netmask-format { bitcount | decimal | hexadecimal } and Router(config-if)#IP netmask-format { bitcount | decimal | hexadecimal } are correct. You can configure the mask for the current session and you can configure it for a specific line.
40. When configuring the subnet mask for an IP address, which formats can be used?
    * dotted-decimal.
    * Hexadecimal
    * Bit-count
    * Octal
    * Binary

    Correct answer: **A, B &C**
41. You are given the following address: 153.50.6.27/25. Determine the subnet mask, address class, subnet address, and broadcast address.
    * 255.255.255.128, B,153.50.6.0, 153.50.6.127
    * 255.255.255.128, C,153.50.6.0, 153.50.6.127
    * 255.255.255.128, C,153.50.6.127, 153.50.6.0
    * 255.255.255.224, C,153.50.6.0, 153.50.6.127

    Correct answer: **A**
42. You are given the following address: 128.16.32.13/30. Determine the subnet mask, address class, subnet address,
    and broadcast address.
    * 255.255.255.252, B,128.16.32.12, 128.16.32.15
    * 255.255.255.252, C,128.16.32.12, 128.16.32.15
    * 255.255.255.252, B,128.16.32.15, 128.16.32.12
    * 255.255.255.248, B,128.16.32.12, 128.16.32.15

    Correct answer: **A**
43. You are given the following address: 15.16.193.6/21. Determine the subnet mask, address class, subnet address,
    and broadcast address.
    * 255.255.248.0, A, 15.16.192.0, 15.16.199.255
    * 255.255.248.0, B, 15.16.192.0, 15.16.199.255
    * 255.255.248.0, A, 15.16.199.255, 14.15.192.0
    * 255.255.242.0, A, 15.16.192.0, 15.16.199.255

    Correct answer: **A**
44. You have an IP host address of 201.222.5.121 and a subnet mask of 255.255.255.248. What is the broadcast address?
    * 201.222.5.127
    * 201.222.5.120
    * 201.222.5.121
    * 201.222.5.122

    Correct answer: **A**

    The easiest way to calculate this is to subtract 255.255.255.248 (subnet mask) from 255.255.255.255, this
    equals 7. Convert the address 201.222.5.121 to binary–11001001 11011110 00000101

01111001. Convert the
mask 255.255.255.248 to binary–11111111 11111111 11111111 11111000. AND them together to get: 11001001 11011110

45. 01111000 or 201.222.5.120. 201.222.5.120 is the subnet address, add 7 to this address for 201.222.5.127 or
the broadcast address. 201.222.5.121 through 201.222.5.126 are the valid host addresses.
46. Given the address 172.16.2.120 and the subnet mask of 255.255.255.0. How many hosts are available?
* 254
* 510
* 126
* 16,372
Correct answer: **A**
172.16.2 120 is a standard Class B address with a subnet mask that allows 254 hosts.
You are a network administrator and have been assigned the IP address of 201.222.5.0. You need to have 20 subnets with 5 hosts per subnet. The subnet mask is 255.255.255.248.
47. Which addresses are valid host addresses?
* 201.222.5.17
* 201.222.5.18
* 201.222.5.16
* 201.222.5.19
* 201.222.5.31
Correct answer: **A,B & D**
Subnet addresses in this situation are all in multiples of 8. In this example, 201.222.5.16 is the subnet, 201.22.5.31 is the broadcast address. The rest are valid host IDs on subnet 201.222.5.16.
48. You are a network administrator and have been assigned the IP address of 201.222.5.0. You need to have 20 subnets with
49. hosts per subnet. What subnet mask will you use?
* 255.255.255.248
* 255.255.255.128
* 255.255.255.192
* 255.255.255.240
Correct answer: **A**
By borrowing 5 bits from the last octet, you can. have 30 subnets. If you borrowed only 4 bits you could only have 14 subnets. The formula is (2 to the power of n)-2. By borrowing 4 bits, you have (2×2x2×2)-2=14. By borrowing 5 bits, you have (2×2x2×2x2)-2=30. To get 20 subnets, you would need to borrow 5 bits so the subnet mask would be 255.255.255.248.
50. You are given the IP address of 172.16.2.160 with a subnet mask of 255.255.0.0. What is the network address in binary?
* 10101100 00010000
* 00000010 10100000
* 10101100 00000000
* 11100000 11110000
Correct answer: **A**
To find the network address, convert the IP address to binary–10101100 000100000 00000010 10100000–then ANDed it with the subnet mask–11111111 11111111 00000000 00000000. The rest is 10101100 00010000 00000000 00000000, which is 172.16.0.0 in decimal.

The first octet rule states that the class of an address can be determined by the numerical value of the first octet.

51. Which addresses are INCORRECTLY paired with their class?
    * 128 to 191, Class B
    * 192 to 223 Class B
    * 128 to 191, Class C
    * 192 to 223, Class C

    Correct answer: **B & C**

    Address classes are: 1 to 126, Class A; 128 to 191, Class B, 192 to 223, Class C; 224 to 239, Class D; and
52. to 255, Class E. The first octet rule states that the class of an address can be determined by the numerical value of the first octet.
53. Which addresses are INCORRECTLY paired with their class?
    * 1 to 126, Class A
    * 128 to 191, Class A
    * 1 to 126, Class B
    * 128 to 191, Class B

    Correct answer: **B & C.**

    Address classes are: 1 to 126, Class A; 128 to 191, Class B, 192 to 223, Class C; 224 to 239, Class D; and
54. to 255, Class E. The first octet rule states that the class of an address can be determined by the numerical value of the first octet.
55. Which addresses are INCORRECTLY paired with their class?
    * 240 - 255, Class D
    * 240 - 255, Class E
    * 224 - 239, Class D
    * 224 - 239, Class E

    Correct answer: **A & D**

    Address classes are: 1 to 126, Class A; 128 to 191, Class B, 192 to 223, Class C; 224 to 239, Class D; and 240 to 255, Class E.
56. Which IP Address Class is INCORRECTLY paired with its range of network numbers?
    * Class A addresses include 192.0.0.0 through 223.255.255.0
    * Class A addresses include 1.0.0.0 through 126.0.0.0
    * Class B addresses include 128.0.0.0 through 191.255.0.0
    * Class C addresses include 192.0.0.0 through 223.255.255.0
    * Class D addresses include 224.0.0.0 through 239.255.255.0

    Correct answer: **A**

    Class A addresses include 1.0.0.0 through 126.0.0.0
    Class B addresses include 128.0.0.0 through 191.255.0.0
    Class C addresses include 192.0.0.0 through 223.255.255.0
    Class D addresses include 224.0.0.0 through 239.255.255.0
57. Which IP Address Class can have 16 million subnets but support 254 hosts?
    * Class C
    * Class A
    * Class B
    * Class D

    Correct answer: **A**

    Possible Subnets IP Address Class Possible Hosts
58. A 16M.
    64K B 64K
    16M C 254

59. Which IP Address Class can have 64,000 subnets with 64,000 hosts per subnet?
    * Class B
    * Class A
    * Class C
    * Class D
    Correct answer: **A**
    IP Address Class Possible Subnets Possible Hosts
60. A 16M
    64K B 64K
    16M C 254
61. There are two processes to pair MAC address with IP addresses. Which process finds an IP address from a MAC address?
    * RARP
    * ARP
    * RIP
    * IGRP
    Correct answer: **A**
    ARP (Address Resolution Protocol) maps an IP address to the MAC address, RARP (Reverse Address Resolution Protocol) maps the MAC address to the IP address. ARP and RARP work at the internet layer of the Internet Model or the network layer of the OSI model.
62. When the router runs out of buffer space, this is called _____.
    * Source Quench
    * Redirect
    * Information Request
    * Low Memory
    Correct answer: **A**
    Source quench is the process where the destination router, or end internetworking device will “quench” the date from the “source”, or the source router. This usually happens when the destination router runs out of buffer space to process packets.
63. Which protocol carries messages such as destination Unreachable, Time Exceeded, Parameter Problem, Source Quench, Redirect, Echo, Echo Reply, Timestamp, Information Request, Information Reply, Address Request, and Address Reply?
    * ICMP
    * UDP
    * TCP
    * TFTP
    * FTP
    Correct answer: **A**
    ICMP (Internet Control Message Protocol) is a network layer internet protocol described in RFC # 792. ICMP reports IP packet information such as destination Unreachable, Time Exceeded, Parameter Problem, Source Quench, Redirect, Echo, Echo Reply, Timestamp, Information Request, Information Reply, Address Request, and Address Reply.
64. Two of the protocols that can be carried in the Protocol field of an IP packet are?
    * TCP
    * UDP
    * FTP
    * TFTP
    Correct answer: **A & B**
    The following are the fields in an IP segment,
    their length, and their definitions:
    VERS (Version number - 16 bits)

HLEN (Number of 32-bit words in the header - 4 bits)
Type of Server (How the datagram should be handled - 32 bits)
Total Length (Total length of header and data - 32 bits)
Identification (Provide fragmentation of datagrams to allow different MTUs in the internet - 4 bits)
Flags (Provide fragmentation of datagrams to allow different MTUs in the internet - 4 bits)
Frag Offset (Provide fragmentation of datagrams to allow different MTUs in the internet - 6 bits)
TTL (Time-To-Live - 6 bits)
Protocol (Upperlayer protocol sending the datagram - 16 bits)
Header Checksum)Integrity check on the header - 16 bits)
Source IP Address (32 bits)
Destination IP Address (32 bits)
IP Options (network testing, debugging, security and others - 4 bits)
Data (4 bits).

65. Where would network testing be included in an IP packet?
* IP Options field
* Identification field
* Type of Service field
* Reservation field
Correct answer: **A**
The following are the fields in an IP segment, their length, and their definitions:
VERS (Version number - 16 bits)
HLEN (Number of 32-bit words in the header - 4 bits)
Type of Server (How the datagram should be handled - 32 bits)
Total Length (Total length of header and data - 32 bits)
Identification (Provide fragmentation of datagrams to allow different MTUs in the internet - 4 bits)
Flags (Provide fragmentation of datagrams to allow different MTUs in the internet - 4 bits)
Frag Offset (Provide fragmentation of datagrams to allow different MTUs in the internet - 6 bits)
TTL (Time-To-Live - 6 bits)
Protocol (Upperlayer protocol sending the datagram - 16 bits)
Header Checksum)Integrity check on the header - 16 bits)
Source IP Address (32 bits)
Destination IP Address (32 bits)
IP Options (network testing, debugging, security and others - 4 bits)
Data (4 bits).

66. What field tells the Internet layer how to handle an IP packet?
* Type of Service
* Identification
* Flags
* Frag Offset
Correct answer: **A**
The following are the fields in an IP segment, their length, and their definitions:
VERS (Version number - 16 bits)
HLEN (Number of 32-bit words in the header - 4 bits)
Type of Server (How the datagram should be handled - 32 bits)
Total Length (Total length of header and data - 32 bits)
Identification (Provide fragmentation of datagrams to allow different MTUs in the internet - 4 bits)

Flags (Provide fragmentation of datagrams to allow different MTUs in the internet - 4 bits)
Frag Offset (Provide fragmentation of datagrams to allow different MTUs in the internet - 6 bits)
TTL (Time-To-Live - 6 bits)
Protocol (Upperlayer protocol sending the datagram - 16 bits)
Header Checksum)Integrity check on the header - 16 bits)
Source IP Address (32 bits)
Destination IP Address (32 bits)
IP Options (network testing, debugging, security and others - 4 bits) Data (4 bits).

67. Which fields of an IP packet provide for fragmentation of datagrams to allow differing MTUs in the internet?
* Identification
* Flags
* Frag Offset
* Type of Service
* Total Length
Correct answer: **A, B & C**
The following are the fields in an IP segment, their length, and their definitions:
VERS (Version number - 16 bits)
HLEN (Number of 32-bit words in the header - 4 bits)
Type of Server (How the datagram should be handled - 32 bits)
Total Length (Total length of header and data - 32 bits)
Identification (Provide fragmentation of datagrams to allow different MTUs in the internet - 4 bits)
Flags (Provide fragmentation of datagrams to allow different MTUs in the internet - 4 bits)
Frag Offset (Provide fragmentation of datagrams to allow different MTUs in the internet - 6 bits)
TTL (Time-To-Live - 6 bits)
Protocol (Upperlayer protocol sending the datagram - 16 bits)
Header Checksum)Integrity check on the header - 16 bits)
Source IP Address (32 bits)
Destination IP Address (32 bits)
IP Options (network testing, debugging, security and others - 4 bits)
Data (4 bits).

68. Which processes does TCP, but not UDP, use?
* Windowing
* Acknowledgements
* Source Port
* Destination Port
Correct answer: **A & B**
UDP (User Datagram Protocol) does not use sequence or acknowledgement fields in transmission.
UDP is a connectionless and unreliable protocol, since there is no delivery checking mechanism in the UDP data format.

69. What is the UDP datagram format?
* Source Port - 16 bits, Destination Port - 16 bits, Length - 16 Bits, Checksum - 16 bits, Data
* Destination Port - 16 bits, Source Port - 16 bits, Length - 16 Bits, Checksum - 16 bits, Data
* Source Port - 16 bits, Destination Port - 16 bits, Checksum - 16 Bits, Length - 16 bits, Data

* Source Port - 8 bits, Destination Port - 8 bits, Length -8 Bits, Checksum - 8 bits, Data

Correct answer: **A**

The UDP format for a segment is as follows:
Source Port 16 bits
Destination Port 16 bits
Length 16 bits
Checksum 16 bits
Data xx bits

70. What is the function of DDR on Cisco routers?
    * DDR is dial–on-demand routing. It provides a continuous LAN only connection.
    * DDR is dial-on-demand routing. It provides routing for high volume traffic.
    * DDR is dial–on-demand routing. It provides a continuous WAN connection.
    * DDR is dial-on-demand routing. It provides routing for low volume and periodic traffic.

    Correct answer: **D**

    DDR is dial-on-demand routing. It provides routing for low volume and periodic traffic. It initiates a call to a remote site when there is traffic to transmit.
71. What are the two types of access lists that can be configured on a Cisco router?
    * Standard
    * Extended
    * Filtering
    * Packet

    Correct answer: **A & B**

    The access lists are standard and extended. Standard access lists for IP check the source address of packets that could be routed. Extended access lists can check the source and destination packet plus check for specific protocols, port numbers, etc.
72. When using access lists, what does a Cisco router check first?
    * To see if the packet is routable or bridgeable
    * The destination address
    * The source address
    * The packet contents

    Correct answer: **A**

    The first thing checked is to see if the packet is routable or bridgeable. If it is not, the packet will be dropped.
73. How many access lists are allowed per interface?
    * One per port, per protocol
    * Two per port, per protocol
    * Unlimited
    * Router interface +1 per port.

    Correct answer: **A**

    Only one access list is allowed per interface. An access list must have conditions that test true for all packets that use the access list.
74. What do the following commands accomplish?
    access-list 1 deny 172.16.4.0 0.0.0.255
    access-list 1 permit any interface ethernet 0
    IP access-group 1 out
    * This will block traffic from subnet 172.16.4.0 and allow all other traffic.
    * This will allow traffic from subnet 172.16.4.0 and block all other traffic.
    * All traffic is allowed.
    * All traffic is blocked.

    Correct answer: **A**

    This will block traffic from subnet 172.16.4.0 and allow all other traffic. The first

statement “access-list 1 deny 172.16.4.0 0.0.0.255″ will deny access to the subnet 172.16.4.0.

75. What do the following statements in an extended access list accomplish?
access-list 101 deny TCP 172.16.4.0 0.0.0.255 172.16.3.0 0.0.0.255 eq 21
access-list 101 deny TCP 172.16.4.0 0.0.0.255 172.16.3.0 0.0.0.255 eq 20
access-list 101 permit TCP 172.16.4.0 0.0.0.255 0.0.0.0 255.255.255.255
* This will block ftp traffic.
* This will block http traffic.
* This will permit ftp traffic.
* This will permit tftp traffic.
Correct answer: **A**
This will block ftp traffic since ftp uses ports 20 and 21.
76. Access lists are numbered. Which of the following ranges could be used for an IP access list?
* 600 - 699
* 100 - 199
* 1 - 99
* 800 - 899
* 1000 - 1099
Correct answer: **wer: B & C**
AppleTalk access lists use numbers in the 600 - 699 range. IP uses 1 - 99 for standard access lists or 100-199 for extended access lists. IPX uses 800 - 899 or 900 - 999 for extended access lists. IPX SAP filters use 1000 - 1099.
77. Cisco routers use wildcard masking to identify how to check or ignore corresponding IP address bits. What does setting a wildcard mask bit to 0 cause the router to do?
* It tells the router to check the corresponding bit value.
* It tells the router to ignore the corresponding bit value.
* It tells the router to check its alternate routing list.
* It tells the router to use its primary routing list.
Correct answer: **A**
It tells the router to check the corresponding bit value.
78. You are a system administrator and you want to deny access to a group of computers with addresses 172.30.16.0 to 172.30.31.0. Which wildcard mask would you use?
* 0.0.15.255
* 0.0.255.255
* 0.0.31.255
* 0.0.127.255
* 0.0.255.255
Correct answer: **A**
0.0.15.255 will check the last 13 bits of an address so that computers 172.30.16.0 to 172.30.31.0 will be denied access. 0.0.31.255 would check the last 6 binary digits and deny access to addresses 172.30.32.0 to 172.30.63.0. 0.0.127.255 would check the last 7 binary digits and deny access to addresses 172.30.64.0 to 172.30.127.0. 0.0.255.255 would deny 172.30.0.0 to 172.30.254.0. If you write decimal 15 in binary, you have 0001111, the 1’s tell the router to ignore address with these bits set; 0’s tell the router to check the bits. The third octet for 172.30.16.0 is 00010000. The third octet for 172.30.31.0 would be 00011111. So, traffic from these addresses would be denied.
79. In order to limit the quantity of numbers that a system administrator has to enter, Cisco can use which abbreviation to indicate 0.0.0.0?
* host
* any
* all
* include

Correct answer: **A**
Cisco uses host to specify 0.0.0.0. This tells the router to check all. Cisco uses any to specify 255.255.255.255. This tells the router to ignore all and permit any address to use an access list test.

80. What do the following commands accomplish?
access-list 1 permit 172.16.0.0 0.0.255.255
interface ethernet 0
IP access-group 1 out
interface ethernet 1
IP access-group 1 out
* Only traffic from the source network 172.16.0.0 will be blocked.
* Only traffic from the source network 172.16.0.0 will be forwarded. Non-172.16.0.0 network traffic is blocked.
* Non-172.16.0.0 traffic will be forwarded.
* All traffic will be forwarded.
Correct answer: **B**
Only traffic from the source network 172.16.0.0 will be forwarded. Non-172.16.0.0 network traffic is blocked. The wildcard mask 0.0.255.255 tells the router to check the first 2 octets and to ignore the last 2 octets.

81. When using access lists, it is important where those access lists are placed. Which statement best describes access list placement?
* Put standard access lists as near the destination as possible. Put extended access lists as close to the source as possible.
* Put extended access lists as near the destination as possible. Put standard access lists as close to the source as possible.
* It isn't import where access lists are placed since the router will read and cache the whole list.
* Put access lists as close to corporate headquarters as possible.
Correct answer: **A**
Put standard access lists as near the destination as possible. Put extended access lists as close to the source as possible. Standard access lists don't specify the destination address.

82. As the system administrator, you enter the following commands at the command prompt:
ipx routing
access-list 800 permit 2b 4d
int e0
ipx network 4d
ipx access-group 800 out
int e1
ipx network 2b
int e2
ipx network 3c
What did these command accomplish?
* Traffic from network 4c destined for network 4d will be forwarded out Ethernet0.
* Traffic from network 3c destined for network 4d will be forwarded out Ethernet0.
* Traffic from network 2b destined for network 4d will be forwarded out Ethernet0.
* Traffic from network 4d destined for network 2d will be forwarded out Ethernet0.
Correct answer: **C**
Traffic from network 2b destined for network 4d will be forwarded out Ethernet0. The other interfaces E1 and E2 are not subject to the access list since they lack the access group statement to link them to access list 800.

83. The following commands were entered at the command prompt of a Cisco router. What do they accomplish?
access-list 1000 deny 9e.1234.5678.1212 4
access-list 1000 permit -1
interface ethernet 0
ipx network 9e
interface ethernet 1
ipx network 4a
interface serial 0
ipx network 1
ipx output-sap-filter 1000
* File server advertisements from server 9e.1234.5678.1212 will not be forwarded on interface S0.
* All other SAP services, other than file server, from any source will be forwarded on S0.
* All other SAP services, other than print server, from any source will be forwarded on S0.
* Print server advertisements from server 9e.1234.5678.1212 will not be forwarded on interface S0.
Correct answer: **A & B**
File server advertisements from server 9e.1234.5678.1212 will not be forwarded on interface S0. All other SAP services, other than file server, from any source will be forwarded on S0.
84. You receive "input filter list is 800 and output filter list is 801″ as part of the output from a show interfaces command. What kind of traffic are you filtering?
* IPX/SPX
* TCP/IP
* LocalTalk
* DDR
Correct answer: **A**
Because the access list is numbered in the 800 range, you are filtering IPX/SPX traffic.
85. Which service uses telephone control messages and signals between the transfer points along the way to the called destination?
* Signaling System 7 (SS7)
* Time-division Multiplexing (TDM)
* X.25
* Frame relay
Correct answer: **A**
Signaling System 7 (SS7) uses telephone control messages and signals between the transfer points along the way to the called destination. Time-division Multiplexing (TDM) has information from multiple sources and allocates bandwidth on a single media. Circuit switching uses signaling to determine the call route, which is a dedicated path between the sender and the receiver. Basic telephone service and Integrated Services Digital Network (ISDN) use TDM circuits. X.25 and Frame Relay services have information contained in packets or frames to share non-dedicated bandwidth. X.25 avoids delays for call setup. Frame Relay uses permanent virtual circuits (PVCs).
86. Which service takes information from multiple sources and allocates bandwidth on a single media?
* Time-division Multiplexing (TDM)
* Signaling System 7 (SS7)
* X.25

* Frame relay

Correct answer: **A**

87. Which three devices can be used to convert the user data from the DTE into a form acceptable to the WAN service's facility?
    * Modem
    * CSU/DSU
    * TA/NT1
    * CO
    * SS7

    Correct answer: **A, B & C**

    A modem, CSU/DSU (Channel Service Unit/Data Service Unit), or TA/NT1 (Terminal Adapter/Network Termination 1) can be used to convert the user data from the DTE into a form acceptable to the WAN service's facility.
88. What is the juncture at which the CPE ends and the local loop portion of the service begins?
    * Demarc
    * CO
    * Local loop
    * Last-mile

    Correct answer: **A**

    The demarcation or demarc is the juncture at which the CPE ends and the local loop portion of the service begins. The CO (Central Office) is the nearest point of presence for the provider's WAN service. The local loop or "last-mile" is the cabling that extends from the demarc into the WAN service provider's central office.
89. You can access three forms of WAN services with Cisco routers. Select the three forms:
    * Switched or relayed services
    * Interface front end to IBM enterprise data center computers
    * Using protocols that connect peer-to-peer devices like HDLC or PPP encapsulation.
    * IPX/SPX
    * NetBEUI

    Correct answer: **A, B & C**

    You can access three forms of WAN services with Cisco routers. Switched or relayed services include X.25, Frame Relay, and ISDN. An interface front end to IBM enterprise data center computers includes SDLC. And, you can access the services of WAN providers using protocols that connect peer devices such as HDLC and PPP encapsulation. IPX/SPX and NetBEUI are LAN protocols.
90. Select the fields for the Cisco HDLC protocol:
    * Flag, Address, Control
    * Flag, Address, Control, Protocol, LCP (Code, Identifier, Length, Data), FCS, Flag
    * Flag, Address, Control, Data, FCS, Flag
    * Flag, Address, Control, Proprietary, Data, FCS, Flag

    Correct answer: **D**

    The Cisco HDLC frame format is Flag, Address, Control Proprietary, Data, FCS, Flag. The PPP frame format is Flag, Address, Control, Protocol, LCP (Code, Identifier, Length, Data), FCS, Flag. The SDLC and LAPB format is Flag, Address, Control, Data, FCS, Flag.

    85: Select the physical interfaces that PPP can be configured on a Cisco router:
    * Asynchronous serial
    * HSSI
    * ISDN
    * Synchronous serial

Correct answer: **A, B, C & D**
All four of them can carry PPP traffic. HSSI is High Speed Serial Interface.

91. Select the correct statements about PPP and SLIP for WAN communications?
* PPP uses its Network Control Programs (NCPs) component to encapsulate multiple protocols.
* PPP can only transport TCP/IP
* SLIP can only transport TCP/IP.
* SLIP uses its Network Control Programs (NCPs) component to encapsulate multiple protocols.
Correct answer: **A & C**
87a Which protocol for PPP LCP (Link Control Protocol) performs a challenge handshake?
* CHAP
* PAP
* UDP
* IPX
Correct answer: **A**
87b Which form of PPP error detection on Cisco routers monitors data dropped on a link?
* Quality
* Magic Number
* Error Monitor
* Droplink
Correct answer: **A**
The Quality protocol monitors data dropped on a link. Magic Number avoids frame looping.

92. Which protocol for PPP provides load balancing across multiple links?
* Multilink Protocol (MP)
* Quality
* Magic Number
* Stacker
* Predictor
Correct answer: **A**

93. As the system administrator, you type “ppp authentication chap pap secret”. Which authentication method is used first in setting up a session?
* secret
* PAP
* CHAP
* PPP/SLIP
Correct answer: **C**

94. Select the compression protocols for PPP?
* Stac
* Predictor
* Quality
* Magic Number
Correct answer: **A & B**

95. What are the three phases of PPP session establishment?
* Link establishment phase
* Authentication phase
* Network layer protocol phase
* Handshake phase
* Dial-in phase
Correct answer: **A, B & C**

96. What is the default IPX Ethernet encapsulation?
    * SNAP
    * Arpa
    * 802.2
    * Novell-Ether
    * SAP
    Correct answer: **D**
97. What must be true for two Routers running IGRP to communicate their routes?
    * Same autonomous system number
    * Connected using Ethernet only
    * Use composite metric
    D)Configured for PPP
    Correct answer: **A**
98. The following is partial output from a routing table, identify the 2 numbers in the square brackets; '192.168.10.0 [100/1300] via 10.1.0.1, 00:00:23, Ethernet1′
    * 100 = metric, 1300 = administrative distance
    * 100 = administrative distance, 1300 = hop count
    * 100 = administrative distance, 1300 = metric
    * 100 = hop count, 1300 = metric
    Correct answer: **C**
99. Identify 3 methods used to prevent routing loops?
    * Split horizon
    * Holddown timers
    * Poison reverse
    * SPF algorithm
    * LSP's
    Correct answer: **A B C**
100. Which statement is true regarding full duplex?
    * Allows for transmission and receiving of data simultaneously
    * Only works in a multipoint configuration
    * Does not affect the bandwidth
    * Allows for transmission and receiving of data but not a the same time
    Correct answer: **A**
    Full duplex is just the opposite of half duplex. It handles traffic in both directions simultaneously.
101. Identify the switching method that receives the entire frame then dispatches it?
    * Cut-through
    * Receive and forward
    * Store and forward
    * Fast forward
    Correct answer: **C**
    Store and forward switching receives the entire frame before dispatching it.
    98Identify the purpose of ICMP?
    * Avoiding routing loops
    * Send error and control messages
    * Transporting routing updates
    * Collision detection
    Correct answer: **B**
    ICMP is used to send error and control messages. Ping uses ICMP to carry the echo-request and echo-reply.
    99Which statement is true regarding the user exec and privileged exec mode?
    * The '?' only works in Privileged exec
    * They are identical

* They both require the enable password
* User exec is a subset of the privileged exec

Correct answer: **D**

The user exec mode is a subset of the privileged exec mode. Only a certain number of commands are available at the user exec mode.

102. Which OSI layer end to end communication, segmentation and re-assembly?

* Network
* Transport
* Physical
* Application
* Data-Link
* Presentation

Correct answer: **B**

Layer 4 the Transport layer performs this function.

103. What IP command would you use to test the entire IP stack?

* Stack-test
* Arp
* Telnet
* Ping
* Trace

Correct answer: **C**

Because Telnet is an application and it resides at the top of the stack it traverses down the stack and up the stack at the receiving end.

104. Identify the 2 hardware components used to manage and/or configure a router?

* Auxiliary port
* ROM port
* Management port
* Console port

Correct answer: **A D**

The 2 hardware ports used to configure the router are the console and auxiliary ports.

105. What is the default bandwidth of a serial connection?

* 1200 baud
* 1.544 Mbps (T1)
* 10 Mbps
* 96Kpbs

Correct answer: **B**

The default bandwidth is T1.

106. Identify 2 functions of IPX access-lists?

* Control SAP traffic
* Limit number of Novell servers on a network
* Limit number of workstations on a network
* Block IPX traffic

Correct answer: **A D**

IPX access lists are used to restrict IPX traffic and SAP broadcasts.

107. Identify 2 HDLC characteristics?

* Default serial encapsulation
* Open standard
* Supports Stacker compression
* Supports point-to-point and multipoint

Correct answer: **A D**

HDLC is the default serial encapsulation and supports point-to-point and multipoint. It is not an open standard and does not support compression.

108. Identify 3 IP applications?
* AURP
* ARP
* Telnet
* SMTP
* DNS
* RARP

Correct answer: **C D E**

ARP and AURP are not part the application layer of the TCP/IP stack. SMTP - Simple Mail Transfer Protocol, Telnet, DNS - Domain Name Services (name to IP resolution).

109. Identify 3 LAN technologies?
* FDDI
* HDLC
* HSSI
* X.25
* 802.3
* 802.5

Correct answer: **A E F**

The question is asking for 3 LAN technologies, HDLC, HSSI and X.25 are all WAN technologies.

110. Identify the 4 that are not LAN technologies?
* HDLC
* FDDI
* 802.5
* HSSI
* SDLC
* Frame Relay

Correct answer: **A D E F**

802.5 and FDDI are LAN technologies

111. Which OSI layer supports the communication component of an application?
* Data-Link
* Physical
* Session
* Presentation
* Application
* Transport

Correct answer: **E**

Layer 7 the Application layer performs this function.

112. Identify the length of an IPX address and it's components?
* 80 bits, 48 bits network and 32 bits node
* 32 bits, 16 bits network and 16 bits node
* None of the above
* 80 bits, 32 bits network and 48 bits node

Correct answer: **D**

IPX address has 2 components; network and node. The network address is 32 bits and the node is 48 bits, total of 80 bits.

113. Identify the administrative distance and appropriate routing protocol?
* RIP = 255, IGRP = 100
* RIP = 100, IGRP = 120
* RIP = 1, IGRP = 0
* RIP = 120, IGRP = 100

Correct answer: **D**

The administrative distance for RIP is 120 and IGRP is 100. The lower the AD the better the routing information.

114. Which OSI layer incorporates the MAC address and the LLC?
* Data link
* Network
* Physcial
* Transport
Correct answer: **): A**
Layer 2 the Data-Link layer incorporates the MAC and LLC sublayers

115. If configuring a Cisco router to connect to a non-Cisco router across a Frame Relay network, which encapsulation type would you select?
* Q933a
* ISDN
* IETF
* CISCO
* ANSI
Correct answer: **C**
There are two types of Frame Relay encapsulations; Cisco and IETF. IETF is required when connecting a Cisco to a non-Cisco router.

116. Identify the 2 items that TCP and UDP share in common?
* Both use port numbers to identify upper level applications
* Operate at the Network layer
* Both are Transport protocols
* Both are reliable communications
Correct answer: **A C**
TCP and UPD are both layer 4 Transport protocols and both use port number to identify upper level applications.

117. Identify 3 characteristics of IP RIP?
* Distance vector
* Administrative distance is 120
* Periodic updates every 60 seconds
* Uses a composite metric
* Can load balance
Correct answer: **A B E**
IP RIP is a distance vector protocol, it can load balance up to 4 equal cost paths and it's rating of trustworthiness is 120.

118. Which of the following is a layer 2 device?
* Switch
* Router
* Repeater
* Hub
Correct answer: **A**
A Hub and Repeater are layer 1 devices. A Router is a layer 3 device.

119. Identify the definition of demarcation?
* Date in which the WAN service contract expires
* Cabling which extends from the WAN service provider to the customer
* Division of responsibility, where the CPE ends and the local loop begins
* Equipment which is located at the customer premises
Correct answer: **C**
Demarcation is the point in which responsibility changes hands.

120. Identify the 3 key features of the Cisco Discovery Protocol?
* Off by default
* Will allow for the discovery of layer 3 addresses on neighbor routers

* Verify connectivity
* Open standard
* Does not require any layer 3 protocols to be configured

Correct answer: **B C E**

CDP is used for 2 basic reasons; neighbor connectivity and layer 3 discovery if configured. It is proprietary and is on by default.

121. Identify the 3 characteristics of IPX RIP?

* Distance vector
* Does not support multiple paths
* 60 second updates
* Default encapsulation is SAP
* Uses ticks and hop count as a metric

Correct answer: **A C E**

IPX RIP is a distance vector routing protocol, it does support multiple paths, the default encapsulation is 'novell-ether', it uses tick count as a primary metric and hop count as a tie breaker and it sends itÃ¢â‚¬â„¢s updates every 60 seconds.

122. Identify the access-list range for an extended IP access-list?

* 800 - 899
* 1 - 99
* 1000 - 1099
* 100 - 199

Correct answer: **D**

IP extended access-lists use the number range of 100-199.

123. Identify the X.25 addressing standard?

* X.121
* X.25a
* ITU-1
* Q933a

Correct answer: **A**

The X.25 layer 3 addressing standards is X.121.

124. Identify 3 features of IGRP?

* Composite metric
* New horizon
* Flash updates
* 60 periodic updates
* Poison reverse

Correct answer: **A C E**

IGRP uses a composite metric made up of bandwidth and delay by default, it updates every 60 seconds and will trigger an update if the topology changes.

125. Where is the backup configuration file stored?

* RAM
* ROM
* Console
* NVRAM

Correct answer: **D**

One location to store the backup configuration is NVRAM.

126. Identify the correct pair of Novell Ethernet encapsulation and Cisco terminology?

* Ethernet II, Snap
* Ethernet 802.3, Novell-Ether
* Ethernet SNAP, Arpa
* Ethernet 802.2, Snap

Correct answer: **B**
The default IPX LAN encapsulation is Novell-Ether which is 802.3

127. Identify 3 characteristics regarding IP access-lists?
* Can be configured as a standard access-list
* Can be run from another router running IP
* Can be configured as a named access-list
* Are the same as IPX access-lists
* Can be configured as an extended access-list
Correct answer: **A C E**
There are 3 types of IP access-lists; standard, extended and named. Named access-lists can be either standard or extended depending on how they are configured.

128. Identify 3 ways in which a router can be configured?
* TFTP
* Nvram
* Ping
* Console
* Trace
Correct answer: **A B D**
Changes to the configuration can be entered via the console, a config stored in NVRAM or on a TFTP server. Trace and ping are tools to verify connectivity.

129. A traffic light is an example of what type of mechanism?
* Collision detection
* Flow control
* Sequence numbering
* Network management
Correct answer: **B**
A Traffic light is an example of flow control.

130. Windowing is a type of?
* Negative acknowledgement
* Address resolution
* Layer transition mechanism
* Flow control
Correct answer: **D**
Windowing allow the sender and receiver to dictate how much information that can be received prior to an acknowledgement. It is a form of flow control.

131. Identify the 2 types of access-list filters that control SAP traffic?
* Novell-ether
* Arpa
* Input-sap-filter
* Round-robin
* Output-sap-filter
Correct answer: **C E**
SAP's can be blocked by 2 methods; inbound and outbound.

132. Identify the 3 guidelines for routers in the same autonomous system?
* Must be configured for IGRP or RIP
* Interconnected
* Assigned the same autonomous system number
* Configured for the same routing protocol
* Must be same model of router
Correct answer: **B C D**
Autonomous system must be interconnected, assigned the same AS # and configured with the same routing protocol.

133. Identify the hardware component used to store buffers, tables, running-configuration etc?
* NVRAM
* ROM
* RAM
* Flash
Correct answer: **C**
RAM is the dynamic memory area. ROM contains the boot strap code, NVRAM contains the startup-config and Flash contains the IOS.

134. Identify 3 UDP characteristics?
* Reliable communication protocol
* Applications that use UDP must incorporate reliability
* Connection-less oriented
* Incorporates no handshaking
Correct answer: **B C D**
UPD is a layer 4 Transport protocol. It is connection-less because it does establish a connection therefore the 3 step handshake is not needed, it does NOT implement any flow control or acknowledgments. Any application that uses UDP must incorporate any needed reliability.

135. Identify the IPX standard access-list number range?
* 600 - 699
* 1000 - 1099
* 1 - 99
* 100 - 199
* 800 - 899
Correct answer: **E**
IPX standard access-list range is 800-899.

136. Which OSI layer provides best effort end to end packet delivery?
* Data-Link
* Presentation
* Network
* Transport
* Physical
* Application
Correct answer: **C**
Layer 3 the Network layer performs this function.

137. Identify the 2 methods to modify the routers boot sequence?
* Setup program
* Boot system commands
* RXBoot
* Config-register
Correct answer: **B D**
'Boot system' command the 'config-register' are used to manipulate the boot sequence.

138. Identify the 3 pieces of hardware you would not install to prevent broadcasts?
* Switch
* Repeater
* Bridge
* Router
Correct answer: **A B C**
Router are implemented not only to break up networks into smaller segments but they are used to block broadcasts.

139. Identify 2 features of PPP PAP authentication?
* Username and password is sent in clear text
* Authentication messages are sent periodically during the connection
* More secure than CHAP
* Remote node is control of authentication process
Correct answer: **A D**
PPP PAP authentication sends the username and passwords in clear text and the remote node initiates the authentication process.

140. Identify the switching method that examines the destination MAC address as the frame is being received then begins forwarding the frame prior to receiving the entire frame?
* Fragment-free
* Store and Forward
* Cut-through
* Fast forward
Correct answer: **C**
Cut through examines the destination MAC address and begins forwarding the frame prior to receiving the entire frame.

141. Identify 1 characteristic of RARP?
* IP to MAC address translation
* Connectionless delivery of packets
* Can be used to initiate remote O/S load sequence
* Generates error and control messages
Correct answer: **C**
Reverse Address Resolution Protocol is used to obtain a layer 3 address if the MAC address is known which then facilitates the loading of the O/S.

142. Identify the protocol to test connectivity without configuring any layer 3 protocols?
* TCP
* Ping
* IP
* CDP
* Telnet
Correct answer: **D**
CDP can be used to verify connectivity prior to any layer 3 protocols being configured.

143. LMI operates between the Frame Switch and what other device?
* CPE device
* Another Frame Switch
* X.25 switch
* Novell File Server
Correct answer: **A**
LMI stands for local management interface. It operates between the Frame Relay switch and the customer equipment.

144. Identify IPX SAP and it's purpose?
* Sonet Access Pipe - interface to Sonet ring
* Service Advertising Protocol - advertise services
* Server Appletalk Protocol - appletalk directory services
* Service Access Point - identify upper layer protocols
Correct answer: **B**
SAP is an Novell protocol to advertise services.

145. Identify the default values that make up IGRP's composite metric?
* Bandwidth

* Load
* Reliability
* MTU
* Delay

Correct answer: **A E**

IGRP can be configured to use all 5 within it's metric. By default it uses bandwidth and delay.

146. Identify the default serial encapsulation?

* ISDN
* HDLC
* SDLC
* Frame Relay
* PPP

Correct answer: **B**

The default serial encapsulation is HDLC.

147. Identify the purpose of ARP?

* Avoiding routing loops
* Determining a workstation's IP address
* Sending a directed broadcast
* Determining a workstation's MAC address

Correct answer: **D**

ARP is used to find a devices MAC address given an IP address.

148. What is the purpose of the DLCI?

* Identifies the remote routers
* Contained with a 802.2 frame for routing purposes
* Used with PPP during authentication
* Identifies the PVC in a Frame Relay network

Correct answer: **D**

DLCI stands for Data Link Connection Identifier. It identifies the local PVC.

149. Identify 3 characteristics of the Network layer (OSI layer 3)?

* Connection oriented
* Path determination
* Supports multiplexing
* Manages sessions
* Packet forwarding

Correct answer: **B C E**

The network layer is responsible for routing which entails learning the paths, selecting the best path and forwarding the packet. Because it services multiple layer 4 protocols it multiplexes.

150. Identify 3 characteristics of switches?

* Increase available bandwidth
* Decrease broadcast traffic
* Support full duplex in a multipoint topology
* Make forwarding decision using MAC address
* Create collision domains

Correct answer: **A D E**

Switches operate at layer 2. They increase bandwidth by reducing the number of devices sharing the media. They isolate collisions. Like a bridge they forward traffic based upon layer 2 address/ MAC address.

151. Which OSI layer handles physical address, network topology?

* Presentation
* Physical
* Transport

* Application
* Data-Link
* Network

Correct answer: **E**

Layer 2 the Data-Link layer performs this function.

152. Identify 2 reasons for disabling CDP?

* If the router is not configured for RIP
* Save bandwidth by eliminating overhead
* If the router is configured for Appletalk
* When connected to a non-Cisco router

Correct answer: **B D**

CDP can be disabled here are a couple of reasons. Connecting a Cisco router to a non-Cisco router. Don't want to exchange CDP information to save bandwidth.

153. Identify 3 characteristics of ISDN?

* Transports voice and data
* Transports voice only
* Support both BRI and PRI
* Runs over existing phone lines
* Same as X.25

Correct answer: **A C D**

ISDN supports voice, data, and video. It runs over existing phone lines and supports 128K (BRI) and T1 (PRI).

154. Identify the 3 characteristics of IGRP?

* Uses hop count as a metric
* Supports multiple unequal paths
* Administrative distance is 100
* Configured with an Autonomous system number
* Link state

Correct answer: **B C D**

IGRP is a distance vector routing protocol, it's degree of trustworthiness is 100, it can support up to 6 un-equal paths and must be configured with an autonomous system number.

155. Identify 2 features of PPP CHAP authentication?

* Username and password is sent in clear text
* Authentication messages are sent periodically during the connection
* Less secure then PAP
* Local router 'challenges' the remote router

Correct answer: **B D**

PPP CHAP authentication message are sent periodically during the connection by challenging the other end of the connection.

It is more secure than PAP and passwords and username are encrypted.

156. Identify the default IPX serial encapsulation?

* Novell-Ether
* SDLC
* SNAP
* HDLC

Correct answer: **D**

The default IPX serial encapsulation is HDLC.

157. Identify the hardware component that stores the backup configuration?

* RAM
* NVRAM
* Flash
* ROM

Correct answer: **B**
NVRAM contains the backup config. RAM is the dynamic memory area, ROM contains the boot strap code and Flash contains the IOS.

158. Identify the extended IP access-list number range?
* 600 - 699
* 1 - 99
* 900 - 999
* 100 - 199
Correct answer: **D**
The extended IP access-list range is 100-199.

159. Identify 3 Fast Ethernet technologies?
* 100 Base FastEther
* 100 Base FX
* 100 Base T4
* 100 Base TX
Correct answer: **B C D**

160. BaseFastEther is false. 100 Base FX, TX and T4 are all valid.

161. Identify the OSI layer which is responsible for end-to-end connections?
* Network
* Transport
* Session
* Data link
* TCP
Correct answer: **B**
Layer 4 is the Transport layer and is responsible for end-to-end connections.

162. Identify the 2 characteristics regarding MAC addresses?
* Contains a network portion and host portion
* Always assigned by System Administrator
* 48 bits long
* Contains a vendor code and serial number
Correct answer: **C D**
MAC addresses are assigned by the vendor. Each MAC address is 48 bits long and made up of 24 bits vendor code and 24 bits serial number.

163. Identify the number range for IPX SAP filters?
* 900 - 999
* 1000 - 1099
* 800 -899
* 100 - 199
Correct answer: **B**
The IPX SAP filtering range is 1000-1099.

164. What is the purpose of ARP?
* IP to host name resolution
* Host name to IP address resolution
* Mac to IP address resolution
* IP to Mac address resolution
Correct answer: **D**
Address Resolution Protocol resolves the MAC address if the IP address is known. It is a layer 3 protocol.

165. Which OSI layer establishes, maintains and terminates sessions between hosts?
* Application
* Physical
* Data-Link

* Presentation
* Network
* Session

Correct answer: **F**

Layer 5 the Session layer performs this function.

166. Which statement is true regarding Administrative distance?

* It is a metric
* Number of hops between two routers
* Trustworthiness of the routing information
* RIP Administrative distance is 100

Correct answer: **C**

Administrative distance is rating of trustworthiness of the routing information. The lower the AD the better the information.

167. Identify the purpose of the Ping command?

* Share routing information with a neighbor router
* Transmit user data when buffers are full
* Test connectivity at layer 3
* Test entire protocol stack

Correct answer: **C**

The ping command tests layer 3 connectivity.

168. Identify the order of the 5 step encapsulation?

1. Create the segment
2. Convert the frame to bits
3. Create the packet
4. Create the frame
5. User creates the data

* 1,2,4,2,5
* 2,1,3,4,5
* 5,1,3,4,2
* 5,3,4,1,2

Correct answer: **C**

Cisco 5 step encapsulation.

1) User creates Data
2) Data is converted into a segment at layer 4
3) The segment is converted to packet at layer 3
4) The packet it converted into a frame at layer 2
5) The frame is converted into bits at layer 1

169. The Cisco IOS is stored where?

* ROM
* CD
* Flash
* NVRAM

Correct answer: **C**

By default the Cisco IOS is stored in flash.

170. Sequence and acknowledgement numbers are used for?

* Layer transitioning
* Flow control
* Port number addressing
* Reliability

Correct answer: **D**

TCP uses sequence numbers and acknowledgements to implement reliability.

171. Identify IPX GNS and it's purpose?

* Go Network Server - sends a print job to a network server

* Get Nearest Server - locate the nearest server
* Guaranteed Network Services - allocates resources to users
* Get Notes Server - locates Domino Server

Correct answer: **B**

GNS stands for Get Nearest Server, initiated by a workstation.

172. Identify the true statement regarding subnetting?

* Allows for more host address
* Borrow bits from the network portion of the address
* Allows for unlimited number of networks
* Borrow bits from the host portion of the address

Correct answer: **D**

Subnetting involves borrowing bits for the host portion of the address to be used to subnet addressing.

173. Inverse ARP serves what purpose?

* Method for a local router to introduce itself to the remote end of the connection
* Broadcast a routing table update
* Identify MAC addresses if the IP address is known
* Sent every 10 seconds used to verify the Frame Switch is still active

Correct answer: **A**

Inverse ARP operates in a Frame Relay network so the two end points can identify themselves to each other.

174. Identify 3 characteristics of a MAC address?

* Burned into the NIC
* 48 bits long
* Length is 32 bits
* Used to deliver the frame to the end device
* Contains a network portion and a host portion

Correct answer: **A B D**

The MAC address is 48 bits long not 32. It does NOT contain a network and host portion with the address. It is used to deliver the frame to the destination device.

175. Identify 3 IP routing protocols?

* RIP
* AURP
* OSPF
* IGRP
* ARP
* ICMP

Correct answer: **A C D**

AURP and ICMP are not routing protocols.

176. Identify the type of routing protocol that exchanges entire routing tables at regular intervals?

* Link state
* Interior gateway protocols
* Appletalk routing
* Distance vector

Correct answer: **D**

Distance Vector routing protocols exchange entire routing tables with it's neighbors. Link State routing protocols exchange LSP's to share information regarding the networks they know.

177. Identify the type of hardware required to connect a Token ring network to an Ethernet network?

* Repeater
* TR-Enet

* Router
* Token Ring to Ethernet translation hub

Correct answer: **C**

Routers are used to connect dissimilar networks with different access-methods, like connecting Token Ring to Ethernet.

178. Identify 3 characteristics regarding CDP?

* On by default
* Shows only directly connected neighbors
* Requires IP or IPX
* 60 second update interval by default
* 30 second updates interval by default

Correct answer: **A B D**

CDP stands for Cisco Discovery Protocol. It is used to discover directly connected neighbors, it is on by default and has a 60 second update interval by default.

179. Identify 2 transport layer protocols?

* IP
* TCP
* CDP
* ARP
* UDP

Correct answer: **B E**

TPC and UDP are 2 layer4 Transport protocols.

180. Identify 2 features of X.25?

* Supports only IP
* Utilizes switched and permanent virtual circuits
* Contains minimal flow control and error recovery
* Utilizes LAPB as it's data-link protocol

Correct answer: **B D**

X.25 utilizes LAPB and uses switched and permanent VC's. It supports multiple layer protocols and is heavy laden with error detection and correction mechanisms.

181. Identify the purpose of the Trace command?

* Explorer packet transmitting routing information
* Test connectivity
* Determine the path a packet is taking through the network
* Transmits user data when buffers are full

Correct answer: **C**

The trace command is used to determine the path a packet has taken through the network.

182. Identify the purpose of the TCP 3 step handshake?

* Setup a un-reliable connection
* Initialize routing tables
* Synchronize sequence numbers between hosts
* Connection tear down process

Correct answer: **C**

The 3 step handshake establishes the parameters required for a TCP connection. During the handshake process sequence numbers are synchronized allowing for the end points to properly acknowledge and re-assemble the segments.

183. Identify 2 PPP characteristics?

* Is proprietary to Cisco
* Supports authentication
* Support compression
* Run on a multi-access network

Correct answer: **B C**

PPP supports authentication; PAP and CHAP. It also supports compression; Stacker and Predictor.

184. Which statement is true regarding half duplex?
* Only works in a point-to-point configuration
* Allows for transmitting and receiving but not a the same time
* Allow for transmitting and receiving of data simultaneously
* Doubles the bandwidth
Correct answer: **B**
Half duplex is analogous to a single a lane bridge, it can handle traffic in both directions but no at the same time.

185. Identify the purpose of the wildcard mask?
* Match a certain portion of the IP address while ignoring the rest of the address
* Determine the class of the IP address
* Determine the network portion of an IP address
* Hide the host portion of an IP address
Correct answer: **A**
The purpose of the wildcard mask to match a certain portion of the IP address while ignoring the rest.

186. Identify the OSI layer associated with bits?
* Physical
* Network
* Binary
* Data link
Correct answer: **A**
The Physical layer converts the frames to bits.

187. Identify the type of routing protocol that maintains a topological database of the network?
* Topological state
* Shortest Path First
* Link state
* Distance vector
Correct answer: **C**
Link State routing protocols maintain a database that lists all the networks in the internetwork.

188. Identify the 3 major functions at layer 3 of the OSI model?
* Forwarding process
* Logical addressing
* End-to-end connections
* Path selection
* MAC address examination
* Network monitoring
Correct answer: **A B D**
Layer 3 determines the path, forwards the packet and implements software or logical addressing.

189. Identify the 2 rules used when configuring a Distance Vector routing protocol?
* Physically connected network(s)
* Configure the classful address, no subnets
* Enable CDP so neighbors can be detected
* Configure all networks in Area0
Correct answer: **A B**
When configuring a Distance Vector routing protocol only assign the physically connected networks with the classful address only.

190. Identify 3 characteristics of an IP address?
* Contains a network portion and a host portion
* 32 bits long
* Unique to each network
* Part of the default Cisco configuration
* Referred to as the hardware address
Correct answer: **A B C**
An IP address is 32 bits long, it is referred as the logical or software address. It contains a network and host portion. Each IP address is unique.

191. Identify 3 feature of access-lists?
* Implicit deny will deny any packets not matched
* Processed sequentially from bottom to top
* Processed sequentially from top to bottom
* If a packet is denied it would be tested against the remaining statements in the access-list
* Once a match is made the packet is either denied or permitted
* Enabled on all interfaces by default
Correct answer: **A C E**
Access-list are processed from top to bottom, once a match occurs the packet is either denied or permitted and is no longer tested and if no match occurs the packet is denied via the implicit deny.

192. Which OSI layer performs code conversion, code formatting and encryption?
* Physical
* Data-Link
* Application
* Transport
* Presentation
* Network
Correct answer: **E**
Layer 6 the Presentation layers performs this function.

193. Identify the 3 methods routers learn paths to destinations?
* Dynamic routing
* None of the above, configured by default
* Default routes
* Administrative distance
* Static routes
Correct answer: **A C E**
Routers can learn paths via 3 different sources; static routes, dynamic routing protocols (i.e. RIP) and default routes.

194. Identify the purpose of the following command ‘ip route 192.168.100.0 255.255.255.0 10.1.0.1′
* Enabling a dynamic routing protocol
* Creating a static route to the 10.1.0.0 network
* Teaches the router about the distant network 192.168.100.0 and how it can be reached via 10.1.0.1
* Assigning the IP address 192.168.100.0 to an interface
Correct answer: **C**
A static routes teaches the router about a distant network and the next hop to reach that network. Command syntax:
ip route network-address subnet-mask next-hop-address

195. Based upon the 1st octet rule identify the range for a Class A address?
* 1 - 126
* 192 - 223

* 128 - 191
* 1 - 191

Correct answer: **A**

Class A address has the 1st octet between 1 - 126. Class B between 128 - 191 and Class C between 192 - 223.

196. What does a Standard IP Access-list use as test criteria?

* IP source address
* IP source and destination address, protocol numbers and port numbers
* IPX source and destination address
* Source MAC address

Correct answer: **A**

Standard IP access list use only source address.

197. What is the function of the Transport layer and which protocols reside there?

* MAC addressing - IP
* Interhost communication - SQL, NFS
* Best effort Packet delivery - TCP, UDP
* End-to-end connections - TCP, UDP

Correct answer: **D**

Layer 4, the Transport layer, is responsible for end-to-end connections. The two TCP/IP protocols that reside there are TCP and UDP.

198. Identify the 3 Internet layer IP protocols?

* NetBios
* IPX
* ARP
* IP
* RARP

Correct answer: **C D E**

NetBios and IPX are not layer 3 IP protocols. IP - Internet Protocol, ARP - Address Resolution Protocol and RARP - Reverse Address Resolution Protocol.

199. IPX routing updates occur how often?

* Every 30 seconds
* Every 60 seconds
* Only as needed
* When the remote router asks for an update

Correct answer: **B**

IPX RIP updates are exchanged every 60 seconds.

200. Identify 3 methods not used to prevent routing loops?

* Holddown timers
* Sequence numbers
* Triggered updates
* Split horizon
* Area hierarchies
* Order of router startup

Correct answer: **B E F**

Area hierarchies, sequence numbers and order of router startup all relate to Link State routing protocols which do NOT incur routing loops.

201. Identify the hardware component that stores the bootstrap program?

* ROM
* NVRAM
* Booter load
* RAM
* Flash

Correct answer: **A**
ROM contains the boot strap code.

202. Which OSI layer provides mechanical, electrical, procedural for activating, maintaining physical link?
* Presentation
* Network
* Application
* Physical
* Transport
* Data-Link
Correct answer: **D**
Layer 1 the Physical layer performs this function.

203. Identify 2 characteristics of PPP?
* Uses LLC to establish the link
* Default serial encapsulation
* Support multiple layer 3 protocols
* Offers two types of authentication; PAP and CHAP
Correct answer: **C D**
PPP is not the default encapsulation and uses LCP not LLC to establish the link. It support multiple layer 3 protocols and supports authentication.

204. Identify 3 characteristics of a connection oriented protocol?
* Path determination
* Flow control
* Acknowledgements
* Uses hop count as metric
* 3 step handshake
Correct answer: **B C E**
Connection oriented protocols must first establish the connection (3 step handshake), employ methods to acknowledge the receipt of data (acknowledgements) and slow down the flow of data if required (flow control).

205. What is the maximum hop count for IP RIP?
* Infinity
* 16
* 15
* 1
Correct answer: **C**

206. is the maximum hop count, underscoring the size limitation of RIP.

207. What is Cisco's default encapsulation method on serial interfaces?
* ANSI
* Cisco
* Q933a
* HDLC
Correct answer: **D**
Cisco's implementation of HDLC is only compatible with Cisco routers. It is the default encapsulation type for serial interfaces.

208. Which of the following is a characteristic of a switch, but not of a repeater?
* Switches forward packets based on the IPX or IP address in the frame
* Switches forward packets based on the IP address in the frame
* Switches forward packets based on the MAC address in the frame
* Switches forward packets based only on the IP address in the packet
Correct answer: **C**
A repeater regenerates the signal it receives, a switch makes decisions based upon

MAC addresses to determine whether a frame should be forwarded. Repeaters forward all packets.

209. Ping uses which Internet layer protocol?

* RARP
* ICMP
* ARP
* FTP

Correct answer: **B**

Internet Control Message Protocol - ICMP is a management protocol and messaging service provider for IP. Its messages are carried as IP datagrams.

ICMP is used in the following events:

Destination Unreachable - If a router cannot send an IP packet any further, it uses an ICMP echo to send a message back to the sender notifying it that the remote node is unreachable.

Buffer Full - If a routers memory buffer is full ICMP will send out a message to the originator.

Hops - Each IP datagram is assigned a path. This consists of hops. If it goes through the maximum number of hops, the packet is discarded and the discarding router sends an ICMP echo to the host.

Ping - Ping use ICMP echo message to check connectivity.

210. Which is true regarding store-and-forward switching method?

* Latency varies depending on frame-length
* Latency is constant
* It is default for all Cisco switches
* It only reads the destination hardware address before forwarding the frame

Correct answer: **A**

Store-and-Forward switching copies the entire frame into its buffer and computes the CRC. If a CRC error is detected, the frame is discarded, or if the frame is a runt (less than 64 bytes including the CRC) or a giant (more than 1518 bytes including the CRC). The LAN switch then looks up the destination address in its switching table and determines the outgoing interface. The frame is then forwarded to the outgoing interface. Cisco Catalyst 5000 switches uses the Store-and-Forward method. The problem with Store-and-Forward switching is latency is increased. Latency also varies with the size of the frame. The larger the frame, the more latency associated. This of course is due to the fact that the entire frame is copied into its buffer before being forwarded.

211. Which three of the following are true statements about connection-oriented sessions?

* The segments delivered are acknowledged back to the sender upon their reception
* Any segments not acknowledged the are retransmitted by the receiver
* A manageable data flow is maintained in order to avoid congestion, overloading and loss of any data
* Segments are sequenced back into their proper order upon arrival at their destination

Correct answer: **A C D**

Connection-oriented services are useful for transmitting data from applications that are intolerant of delays and packet re-sequencing. FTP and Telnet applications are based on connection-oriented services as well as some voice and video programs. Any segment that is not acknowledged by the received is retransmitted by the sender.

212. What does a metric of 16 hops represent when using RIP?

* Number of hops to the destination
* Destination unreachable
* Number of routers
* Bandwidth

Correct answer: **B**
Routing Information Protocol (RIP) is a distance vector routing protocol that used hop count as its metric. The maximum hop count is 15, 16 hops is considered unreachable. RIP updates are broadcast every 30 seconds by default. RIP has an administrative distance of 120.

213. You need to come up with a TCP/IP addressing scheme for your company. Which two factors must you consider when you define the subnet mask for the network?
* The location of DHCP servers
* The volume of traffic on each subnet
* The number of subnets on the network
* The location of the default gateway
* The number of host IDs on each subnet

Correct answer: **C E**
When determining which subnet mask to use, you must determine how many hosts and how many subnets are required.

214. What is the difference between TCP and UDP?
* TCP is connection-oriented; UDP uses acknowledgements only
* TCP is connection-oriented; UDP is connectionless
* Both TCP and UDP are connection-oriented, but only TCP uses windowing
* TCP and UDP both have sequencing, but UDP is connectionless
The correct answer(s): B
TCP provides guaranteed connection oriented delivery of packets, UDP does not.

215. What does the 'S' mean when looking at the routing table?
* Statically connected
* Directly connected
* Dynamically attached
* Shutdown route
Correct answer: **A**
Statically connected routes are those that an administrator has manually entered into the routing table.

216. Why would you use static routing instead of dynamic routing?
* When you want automatic updates of the routing tables
* All the time
* When you have very few routes and want to conserve bandwidth
* When you have a gateway of last resort
Correct answer: **C**
Static routes are typically used when there are very few routes and you want to conserve bandwidth. Since routing protocols are constantly sending their updates across the wire, it can cause a great deal of congestion.

217. On Cisco catalyst 5000 how would you set the second port on the controller in the first slot to full duplex?
* Set port duplex 1/1 full
* Set port duplex 1/2 full
* Set port duplex 0/1 full
* Set port duplex 0/2 full
Correct answer: **B**
The syntax is: set type duplex slot/port

218. What does the acronym ARP stand for?
* Address Resolution Phase
* ARP Resolution Protocol

* Address Resolution Protocol
* Address Recall Protocol

Correct answer: **C**

The Address Resolution Protocol (ARP) resolved IP addresses to MAC addresses.

219. What is the default encapsulation of Netware 3.12?

* Ethernet_II
* 802.5
* 802.2
* 802.3

Correct answer: **C**

The 802.2 Frame Type is the default frame-type for Netware 3.12.

220. Regarding frame relay, which of the following statements are true?

* You must use ANSI encapsulation if connecting to non-Cisco equipment
* You must use IETF encapsulation if connecting to non-Cisco equipment
* You must use Q.933a encapsulation if connecting to non-Cisco equipment
* You must use Cisco encapsulation if connecting to non-Cisco equipment

Correct answer: **B**

Cisco's encapsulation for Frame relay is proprietary. To communicate with non-Cisco equipment when using frame-relay encapsulation, the IETF method must be used.

221. What is required to support full-duplex Ethernet?

* Multiple paths between multiple stations on a link
* Automatic sensing operation by all connected stations
* Loopback and collision detection disabled
* Full-duplex NIC cards

Correct answer: **C D**

Full duplex ethernet requires that the NIC supports full-duplex, and loopback and collision detection are disabled.

222. Which layer is responsible for determining if sufficient resources for the intended communication exists?

* Application
* Network
* Session
* Presentation
* Transport

Correct answer: **A**

The Application layer is responsible for determining if sufficient resources for the intended communication exists.

223. What are the 2 functions of the Data Link Mac layer?

* Handles access to shared media
* Manages protocol access to the physical network medium
* Provides SAPs for higher level protocols
* Allows multiple devices to uniquely identify one another on the data link layer

Correct answer: **B D**

Media Access Control (MAC) -The MAC sublayer manages protocol access to the physical network medium. The IEEE MAC specification defines MAC addresses, which allow multiple devices to uniquely identify one another at the data link layer.

224. Describe End to End network services: (Choose all that apply)

* Best Route selection
* Accomplished Segment by Segment, each segment is autonomous
* Flow Control & Data Integrity
* Best efforts packet delivery

Correct answer: **A B C D**

All of the above End to End network services.

225. Which of the following provide correct information about a protocol at the transport layer of the OSI model?
* UDP - Provides Connectionless datagrams service
* TCP - Provides Connection Oriented Services
* SMTP - Provides Mail Exchange
* IP - Route determination
* TCP - Provides Flow Control and Error Checking
* FTP - Transfers of Files
Correct answer: **A B E**
Only TCP and UDP work at the Transport layer of the above choices. IP is a Network layer protocol. SMTP and FTP are application layer protocols.

226. Which protocol works at the Internet layer and is responsible for making routing decisions?
* UDP
* IP
* TCP
* ARP
Correct answer: **B**
Internet Protocol - IP provides routing and a single interface to the upper layers. No upper layer protocol and now lower layer protocol have any functions relating to routing. IP receives segments from the transport layer and fragments them into packets including the hosts IP address.

227. Which layer is responsible for providing mechanisms for multiplexing upper-layer application, session establishment, and tear down of virtual circuits?
* Session
* Network
* Physical
* Transport
* Application
* Presentation
Correct answer: **D**
The Transport layer does the following: Responsible for end-to-end integrity of data transmission. Handles multiplexing upper-layer application, session establishment and tear down of virtual circuits. Hides details of network dependent info from the higher layers by providing transparent data transfer. The ‘windows’ works at this level to control how much information is transferred before an acknowledgement is required.

228. Which of the following are logged when IP access list logging is enabled?
* source address
* protocol
* source port
* destination address
* access list number
* destination port
Correct answer: **A B C D E F**
All of the above are logged when IP access list logging is enabled.

229. What’s the default CDP holdtime in seconds for Cisco routers?
* 30 seconds
* 180 seconds
* 90 seconds
* 60 seconds
Correct answer: **B**
Cisco Discovery Protocol is a proprietary protocol to allow you to access configuration information on other routers and switches with a single command. It

uses SNAP at the Data-Link Layer. By default CDP sends out a broadcast every 60 seconds and it holds this information for 180 seconds. CDP is enabled by default.

230. Which two of the following protocols are used at the Transport layer?

* ARP
* UDP
* ICMP
* RARP
* TCP
* BootP

Correct answer: **B E**

TCP and UDP operate at the Transport layer.

231. LAN stands for which of the following?

* Local Area Network
* Local Arena Network
* Local Area News
* Logical Area Network

Correct answer: **A**

LAN stands for Local Area Network

232. Choose three reasons why the networking industry uses a layered model:

* It facilitates systematic troubleshooting
* It allows changes in one layer to occur without changing other layers
* It allows changes to occur in all layers when changing one protocol
* It clarifies how to do it rather than what general function to be done
* It clarifies what general function is to be done rather than how to do it

Correct answer: **A B E**

Why do we have a Layered Model?

1) It reduces complexity
2) Allows for a standardized interface
3) Facilitates modular engineering
4) Ensures interoperable technology
5) Accelerates evolution
6) Simplifies teaching and learning

233. Which layer is responsible for identifying and establishing the availability of the intended communication partner?

* Application
* Presentation
* Transport
* Session
* Network

Correct answer: **A**

The Application layer performs the following: Synchronizing sending and receiving applications. Program-to program communication. Identify and establish the availability of the intended communication partner, and determine if sufficient resources exist for the communication. Popular application protocols include WWW, SMTP, EDI, FTP, Telnet, and SNMP