Introduction to TCP

Which of the following protocols are examples of TCP/IP transport layer protocols? (Choose 2 answers.)

a. Ethernet
b. HTTP
c. IP
d. UDP
e. SMTP
f. TCP

Which of the following protocols are examples of TCP/IP data-link layer protocols?

a. Ethernet
b. HTTP
c. IP
d. UDP
e. SMTP
f. TCP
g. HDLC

The process of a web server adding a TCP header to the contents of a web page, followed by adding an IP header and then adding a data-link header and trailer, is an example of what?

a. Data encapsulation
b. Same-layer interaction
c. OSI model
d. All of these answers are correct.

Which of the following terms is used specifically to identify the entity created when encapsulating data inside data-link layer headers and trailers?

a. Data
b. Chunk
c. Segment
d. Frame
e. Packet

The process of HTTP asking TCP to send some data and making sure that it is received correctly is an example of what?

a. Same-layer interaction
b. Adjacent-layer interaction
c. OSI model
d. All of these answers are correct.

Cisco IOS for Routers and Switches

In what modes can you type the command show mac address-table and expect to get a response with MAC table entries? (Choose two answers.)

a. User mode
b. Enable mode
c. Global configuration mode
d. Interface configuration mode

Which of the following is a difference between Telnet and SSH as supported by a Cisco switch?

a. SSH encrypts the passwords used at login, but not other traffic; Telnet encrypts everything.
b. SSH encrypts all data exchange, including login passwords; Telnet encrypts nothing.
c. Telnet is used from Microsoft operating systems, and SSH is used from UNIX and Linux operating systems.
d. Telnet encrypts only password exchanges; SSH encrypts all data exchanges.

What type of switch memory is used to store the configuration used by the switch when it is up and working?

a. RAM
b. ROM
c. Flash
d. NVRAM
e. Bubble

What command copies the configuration from RAM into NVRAM?

a. copy running-config tftp
b. copy tftp running-config
c. copy running-config start-up-config

d. copy start-up-config running-config
e. copy startup-config running-config
f. copy running-config startup-config

Which of the following is true about the **enable secret** command –

a. It forces you to enter a password when you want to get console access to the user exec mode in a switch/router
b. It forces you to enter a password when you go from user exec mode to privileged exec mode.
c. It forces you to enter a password when you go into config mode from privileged exec mode.
d. The password can be seen in plain text when you do the show run command.

Which of the following is true in relation to configuring a switch or router – (Choose 2 answers)

a. When you configure the Console password, it is not automatically encrypted.
b. If you don't add the command **login** after the password command, you will be prompted for a password when you try to connect.
c. Using the **services password-encryption** will encrypt any unencrypted passwords.
d. When to enter the Console password you are automatically in **enable** mode.

Fundmentals of Ethernet LANS

Which of the following statements are true (Choose 2 answers)

a. Full Duplex allows only one device at a time to transmit.
b. Half Duplex allows only one device at a time to transmit.
c. Half Duplex means that 2 devices communicating will transmit at different speeds.
d. Hubs can only work in Half Duplex mode.
e. Switches can only work in Half Duplex mode.

In relation to fibre which of the following statements are true –

a. Multimode mode fibre signals travel further than Single mode fibre.
b. Single mode uses laser to transmit.
c. Fibre is subject to electrical interference.
d. Multimode fibre is more expensive than Single mode.

Which of the following Ethernet standards defines Gigabit Ethernet over UTP cabling?

a. 10GBASE-T
b. 100BASE-T
c. 1000BASE-T
d. None of the other answers is correct.

Which of the following is true about Ethernet crossover cables for Fast Ethernet?

a. Pins 1 and 2 are reversed on the other end of the cable.
b. Pins 1 and 2 on one end of the cable connect to pins 3 and 6 on the other end of the cable.
c. Pins 1 and 2 on one end of the cable connect to pins 3 and 4 on the other end of the cable.
d. The cable can be up to 1000 meters long to cross over between buildings.
e. None of the other answers is correct.

Each answer lists two types of devices used in a 100BASE-T network. If these devices were connected with UTP Ethernet cables, which pairs of devices would require a straight-through cable? (Choose 2 answers.)

a. PC and router
b. PC and switch
c. Hub and switch
d. Router and hub

Switching and the Data Link Layer

Which of the following is true about the Ethernet FCS field?

a. Ethernet uses FCS for error detection.
b. It is 2 bytes long.
c. It resides in the Ethernet header, not the Ethernet trailer.
d. It is used for encryption.

Which of the following terms describe Ethernet addresses that can be used to send one frame that is delivered to multiple devices on the LAN? (Choose two answers.)

a. Burned-in address
b. Unicast address
c. Broadcast address
d. Multicast address

Which of the following statements best describes what a switch does with a frame destined for an **unknown unicast** address?

a. It forwards out all interfaces in the same VLAN except for the incoming interface.
b. It forwards the frame out the one interface identified by the matching entry in the MAC address table.
c. It compares the destination IP address to the destination MAC address.
d. It compares the frame's incoming interface to the source MAC entry in the MAC address table.

Consider the following output from a Cisco Catalyst switch:

SW1# show mac address-table dynamic

Mac Address Table

Vlan	Mac Address	Type	Ports
1	02AA.AAAA.AAAA	DYNAMIC	Gi0/1
1	02BB.BBBB.BBBB	DYNAMIC	Gi0/2
1	02CC.CCCC.CCCC	DYNAMIC	Gi0/3

Total Mac Addresses for this criterion: 3

Which of the following answers is true about this switch?

a. The output proves that port Gi0/2 connects directly to a device that uses address 02BB.BBBB.BBBB.
b. The switch has learned three MAC addresses since the switch powered on.
c. The three listed MAC addresses were learned based on the destination MAC address of frames forwarded by the switch.
d. 02CC.CCCC.CCCC was learned from the source MAC address of a frame that entered port Gi0/3.

In relation to switch which of the following are true –

a. All ports on a switch are in the same collision domain.
b. All ports in a switch are in the same broadcast domain.
c. All switches can route IP packets.
d. All switches have a routing table.

In relation to Hubs which of the following is true –

a. All devices connected to a hub are in the same collision domain.
b. All devices connected to a hub are in different broadcast domains.
c. Hubs use MAC address tables to keep track of connected devices.
d. Hubs are layer 2 devices.

In relation to switches, which of the following is true –

a. MAC Address tables are stored in RAM.
b. MAC Address tables are stored in NVRAM.
c. MAC Address tables are stored in CAM.
d. MAC Address tables are stored in FLASH.

In relation to Switch port security, which of the following is true if Switchport security is enabled – (Choose 2 answers)

a. By default, a maximum of 2 devices can connect to that port.
b. By default, the violation action is shutdown.
c. The second device that connects to the port causes a violation.
d. By default, no action is taken when a violation occurs.

When you issue the following commands in a switch –

Switch(config)#switchport port-security mac-address sticky

Which of the following is true –

a. Sticky copies the first learned MAC address into RAM running-config.
b. Sticky copies the first learned MAC address into NVRAM startup-config.
c. Sticky copies the learned MAC address into FLASH.
d. Sticky copies the learned MAC address to a TFTP server.

Which of the following is true about port security –

a. The default violation mode is Protect.

b. The default violation mode is Restrict.
c. The default violation mode is Shutdown
d. The default violation mode is Hold-down.

A PC has auto-negotiation enabled and is connected to a port on a switch with auto-negotiation enabled. The PC has a maximum speed of 10Mbs and the port on the switch a maximum speed of 1000Mbs. Which of the following is true –

a. The PC will connect at 10Mbs and half duplex to the switch.
b. The PC will connect at 10Mbs and full duplex to the switch.
c. The PC will connect at 1000 Mbs and half duplex to the switch.
d. The PC will connect at 1000Mbs and full duplex to the switch.

Network Layer Concepts

In relation to a network with the Network ID I72.16.1.0/24, which of the following is true – (Choose 3 answers).

a. The first host on this network is 172.16.1.0.
b. The last host on this network is 172.16.1.255.
c. The first host is 172.16.1.1.
d. The last host is 172.16.1.254.
e. The broadcast is 172.16.1.255.

In relation to a network with the Network ID I92.168.1.32/27, which of the following is true – (Choose 2 answers).

a. The first host on this network is 192.168.1.33.
b. The last host on this network is 192.168.1.63.
c. The first host is 192.168.1.32.
d. The last host is 192.168.1.62
e. The broadcast is 172.16.1.64.

In a PC, the default gateway is –

a. The address of the local DHCP server.
b. The address of the local switch.
c. The address of the DNS server.
d. The address of the router connected to the PCs LAN.
e. The address of the local ISP.

The Network Prefix /28 translates to which of the following subnet masks?

a. 255.255.255.128.
b. 255.255.255.192.
c. 255.255.255.224.
d. 255.255.255.240.
e. 255.255.255.248.

The subnet mask 255.255.224.0 translates to which Network Prefix?

a. /27
b. /19
c. /20
d. /28
e. None of the above.

A PC belongs to a network 192.168.1.16 with a subnet mask 255.255.255.240. Which of the following is true – (Choose 2 answers)

a. All devices on this network share the same first 28 bits of the IP address.
b. All devices on this network share the same first 29 bits of the IP address.
c. This is a /29 network.
d. This PC has an IP address in the range 192.168.1.17 to 192.168.1.30.

In relation to the ARP protocol, which of the following is true –

a. It is used to get an IP address when the MAC address is known.
b. It is used to get a MAC address when an IP address is known
c. It is used to translate a URL into an IP address.
d. It is used to translate a URL into a MAC address.

In relation to an ARP table, which of the following is true –

a. It is used in a switch to store MAC addresses and what ports they are connected to.
b. It is used in a PC to map IP addresses to MAC addresses.
c. It is used in a PC to map URLs to IP addresses.
d. It is used in a PC to map URLs to MAC addresses.

Which of the following are true about a LAN-connected TCP/IP host and its IP routing (forwarding) choices?

a. The host always sends packets to its default gateway.
b. The host never sends packets to its default gateway.
c. The host sends packets to its default gateway if the destination IP address is in a different subnet than the host.
d. The host sends packets to its default gateway if the destination IP address is in the same subnet as the host.

IPv4 Addressing and Subnetting

In relation to Classful IP addressing, which of the following is true – (Choose 2 answers)

a. 126.1.1.1 is a Class A address.
b. 126.1.1.1 belongs to a Classful network with a prefix of /16.
c. 126.1.1.1 belongs to a Classful network with a network mask of 255.0.0.0.
d. 126.1.1.1 is a Class B address.
e. None of the above.

In relation to Classful IP addressing, which of the following is true – (Choose 2 answers)

a. 191.1.1.1 is a Class A address.
b. 191.1.1.1 belongs to a Classful network with a prefix of /16.
c. 191.1.1.1 belongs to a Classful network with a network mask of 255.0.0.0.
d. 191.1.1.1 is a Class B address.
e. None of the above.

In relation to Unicasts, Multicasts and Broadcasts, which of the following are true – (Choose 3 answers)

a. A Multicast IP address is destined for every device on the network.

b. A Multicast IP packet must use a MAC Multicast MAC address in the frame containing the IP Multicast packet.
c. A Multicast MAC destination address always begins with ff:ff:ff:.
d. A Multicast MAC destination address always begins with 01:00:5e:
e. An IP broadcast packet must always use a Destination MAC address of ff:ff:ff:ff:ff:ff

To find the Network ID of a network when you know the IP address and subnet mask of a device on that network, which of the following is true –

a. From the subnet mask, count the number of host bits there are and set them all to 0.
b. From the subnet mask, count the number of host bits there are and set them all to 1.
c. Calculate the first available host address and that will be the Network ID.
d. Calculate the last available host address and that will be the Network ID.

;

A device has an IP address of 192.168.10.40/28. Which of the following is true – (Choose 3 answers)

a. The Network ID is 192.168.10.32.
b. The first host is 192.168.10.32.
c. The last host is 192.168.10.62.
d. The last host is 192.168.10.46.
e. The broadcast for this network is 192.168.10.47.
f. The broadcast for this network is 192.168.10.63.

A device has an IP address 192.168.10.40 and a subnet mask 255.255.255.240. Which of the following is true – (Choose 2 answers)

a. There are a maximum of 30 hosts on this network.
b. There are a maximum of 16 hosts on this network.
c. There are a maximum of 14 hosts on this network.
d. The prefix for this network is /27.
e. The prefix for this network is /28.

A network with a Network ID 192.168.10.0/24 is to be subdivided into 6 equal subnets. Which of the following is true – (Choose 3 answers)

a. The new subnet mask must be 255.255.255.224.

b. The new subnet mask must be 255.255.255.240.
c. Each subnet will have a maximum of 30 hosts.
d. Each subnet will have a maximum of 30 hosts.
e. The Subnet ID of subnet 2 is 192.168.10.32.
f. The Subnet ID of subnet 2 is 192.168.10.64.

Which of the following are true in relation to Private IP addresses – (Choose 2 answers)

a. 10.255.255.1 is a Private IP address.
b. The same Private IP addresses cannot be reused in different private networks.
c. Private IP addresses are allowed on public networks such as the Internet.
d. Private IP addresses were created because Public IP addresses were getting scarcer.
e. Private IP addresses were created for security reasons only.

Routing Concepts

Which of the following does a router normally use when making a decision about routing IP packets?

a. Destination MAC address
b. Source MAC address
c. Destination IP address
d. Source IP address
e. Destination MAC and IP addresses

When a router receives a packet, which of the following are true –

a. The router does not check the incoming frame for errors.
b. The router extracts the incoming packet from the frame to check where it goes and puts it back into the same frame to forward to the destination.
c. The router checks the frame for errors and only if it is good, it extracts the packet and forwards it in a new frame to the destination.
d. The router routes an IP packet based on its ARP table.

When a router routes a packet, which of the following is true –

a. If a router finds more than one route match in a routing table, it picks the route with the longest match.
b. If a router finds more than one route match in a routing table, it picks the route with the shortest match.
c. A router will route a packet on the first route it finds that matches the destination IP address.
d. If a router does not find a route that matches the Destination IP address, it sends the packet on the first available route.

When a router routes a packet, which of the following is true – (Choose 2 answers)

a. The router uses cost metrics to choose the cheapest route to use.
b. The router uses cost metrics to choose the best route to use.
c. RIP uses bandwidth as the cost metric.
d. OSPF uses bandwidth as the cost metric.

Which of the following is true of Administrative Distance in a router –

a. It is used with RIP to pick the best route to the destination.
b. It is used with OSPF to pick the best route to the destination.
c. When a router learns a particular route from more than 1 routing protocol, Administrative Distance is used to determine which protocol to accept the route from.
d. It is used to determine who can access the router.

In relation to Administration Distance in routers, which of the following is true –

a. Administrative Distance ranks RIP better than OSPF.
b. Administrative Distance ranks OSPF better than RIP.
c. Administrative Distance ranks Static routes worse than OSPF.
d. OSPF has an Administrative Distance of 1.

Static Routing

In relation to Static Routing, which of the following is true –

a. Static routing is used to tell a router about its own directly connected networks.
b. With Static routing, the router automatically updates its neighbours about all its own directly connected networks.

c. Static routing is used to tell a router about any networks not directly connected to that router.
d. Static routing is ideal for large complex networks.

A default static route does which of the following –

a. Tells the router about its neighbour router.
b. Tells the router how to get to unknown networks that are not already in the routing table.
c. The default static route is used by the router to discard packets that it does not have a route for in the routing table.
d. The default static route will always be chosen as the best route for a destination network even when there are other routes available.

The following command is issued in a router R1 -

R1(config)#ip route 0.0.0.0 0.0.0.0 192.168.1.2

Which of the following is true – (Choose 2 answers)

a. The route is the default static route for the router or gateway of last resort.
b. 192.168.1.2 is the IP address of this router R1.
c. This route will cause a recursive lookup.
d. This is telling the router with the IP address 192.168.1.2 to route packets destined for the internet to this router R1.

The following commands are issued in a router R1 -

R1(config)#ip route 0.0.0.0 0.0.0.0 g0/0/0

R1(config)#ip route 0.0.0.0 0.0.0.0 g0/0/1 **5**

Which of the following is true – (Choose 2 answers)

a. A default static route to 2 different interfaces has been created and packets are forwarded equally over both routes – load balancing.
b. A default static route to 2 different interfaces has been created and the second route on g0/0/1 will be the preferred route.
c. A default static route to 2 different interfaces has been created and the second route, known as a floating static route on g0/0/1 will only be used if the first route to g0/0/0 goes down.
d. A default static route to 2 different interfaces has been created. The first route to g0/0/0 will appear in the routing table and second route to g0/0/1 will not appear in the routing table unless g0/0/0 fails.

e. A default static route to 2 different interfaces has been created whereby for every 5 packet that go out the second interface g0/0/1, one packet goes out on g0/0/0.

In relation to Static Routing, which of the following are true – (Choose 2 answers)

a. You should only use next hop address when configuring static routes that use Gigabit Ethernet interfaces.
b. You should only use exit interface when configuring static routes that use Gigabit Ethernet interfaces.
c. When a router needs to route packets to the next hop address router, it does not need the MAC address of the next hop address router.
d. A router will use the next hop address as the target IP address when it needs the MAC address of the next hop address router when connected using Gigabit Ethernet.

Dynamic Routing Protocols – RIP and OSPF

Which of the following are functions of a routing protocol? (Choose two answers.)

a. Advertising known routes to neighboring routers
b. Learning routes for subnets directly connected to the router
c. Learning routes and putting those routes into the routing table for routes advertised to the router by its neighboring routers
d. Forwarding IP packets based on a packet's destination IP address

In relation to Distance Vector protocols which of the following is true –

a. Distance Vector routing protocol uses Dijkstra's algorithm to calculate the best path to other networks.
b. OSPF is a Distance Vector routing protocol.
c. Distance Vector routing protocols involve a router telling all other neighbor routers directly about its own directly connected networks.
d. Distance Vector routing protocols involve a router telling all its neighbor routers about its own directly connected networks and they tell their neghbors.
e. Distance Vector routing protocols involve a router telling all other routers directly about its own directly connected networks.

Which of the following is true in relation to OSPF and RIP –

a. RIP uses bandwidth as a cost metric.
b. OSPF uses hop count as a cost metric.
c. RIP is better than OSPF for large networks.
d. RIP always picks the fastest route to a destination network.
e. RIP uses hop count as a cost metric.

In relation to RIP which are true about the command
R1(config-router)#network 10.0.0.0
(Choose 2 answers)

a. Any interface with an IP address belonging to that network will be used for RIP updates.
b. Any subnet belonging to the 10.0.0.0/8 network will be advertised to neighbors.
c. The statement tells R1 how to route to the network 10.0.0.0.
d. The statement is not complete as it must include the subnet mask.
e. 10.0.0.0 is an unknown network to R1.

R1 has a static default route defined to connect to the ISP on interface g0/0/0. Which of the following statements in RIP will allow RiP to propagate this route to the other routers –

a. Passive-interface g0/0/0
b. Default-information originate
c. No auto-summary
d. Ip route 0.0.0.0 0.0.0.0 g0/0/0

Which of the following is true in relation to the command in RIP –
R1(config-router)passive-interface g0/0/2

a. This tells the router to propagate the default static route to the other routers using RIP.
b. This tells the router not to forward RIP updates on this interface as it is a LAN.
c. This tells the router to use RIP to advertise the subnet that g0/0/2 belongs to.
d. It tells the router not tosend broadcasts on g0/0/2.

In OSPF, when the following commands are issued
R1(config)#interface fa0/0
R1(config-if)#ip ospf 1 area 0
Which of the following are true –

a. The subnet associated with interface fa0/0 will be advertised in OSPF.

b. This interface fa0/0 will not belong to any area.
c. The router will advertise a cost of 1 for this interface.
d. The interface will not advertise OSPF routes.

VLANs and Inter-VLAN routing

In relation to VLANs which of the following are true –

a. All devices in one VLAN receives broadcasts from all other VLANs.
b. All devices on the same VLAN are always in the same Collision domain.
c. All devices on the same VLAN are always in the same Broadcast domain.
d. 2 devices on 2 different VLANs can communicate with each other directly through a layer 2 switch.

In relation to the IEEE 802.1Q protocol, which of the following are true – (Choose 2 answers)

a. Tags are used in frames to prioritise important traffic.
b. It is a protocol that allows a switch to carry traffic from multiple VLANs on one single connection to another switch, inserting tags in the frames to identify each VLAN.
c. The switch inserts special tags to identify frames from the Native VLAN.
d. The Native VLAN is the only VLAN whose frames do not need a tag.
e. It is a protocol to guarantee Quality of Service.

In relation to the Router-on-a-stick configuration, which of the following are true –

a. The router uses separate physical interfaces to connect to a switch for each VLAN required.
b. The router uses one physical interface to a switch and separate sub-interfaces on that interface for each VLAN required.
c. The configuration is used to connect 2 routers to carry frames from multiple VLAN.
d. The Native VLAN is not used by the router.

A router is configured as follows –

```
R1(config-if)#interface fastethernet 0/0.99
R1(config-subif)#encapsulation dot1q 99 native
R1(config-subif)#ip address 172.17.99.1 255.255.255.0
```

Which of the following is true –

a. This configuration assigns VLAN 99 as the native VLAN to sub-interface fa0/0.99.

b. The first available host IP address on this VLAN will be 172.17.99.1.
c. The encapsulation is not specified.
d. Any device on this VLAN will use a default gateway of 172.16.99.0.

Which of the following is true in relation to Inter VLAN routing –

a. A router can be replaced by a layer 2 switch.
b. A router can be replaced by a layer 3 switch.
c. A router can be replaced by a hub.
d. A router can be replaced by a DHCP server.

The Spanning Tree Protocol - STP

In relation to STP which of the following are true – (Choose 2 answers)

a. STP is used to eliminate routing loops.
b. STP is used to eliminate switching/bridging loops.
c. The Bridge/switch with the highest STP ID is elected the Root bridge.
d. The Bridge/switch with the lowest STP ID is elected the Root bridge.
e. If the Root bridge fails, the network cannot recover.

In relation to the role of Root Ports in STP, which of the following is true – (Choose 2 answers)

a. All switches/bridges have only 1 Root Port.
b. The Root Port is used to forward the STP BPDU frame.
c. The Root Port receives the BPDU.
d. The Root Port cannot forward data frames.
e. All switches/bridges have 1 Root Port except the Root bridge/switch which has none.

In relation to the role of Designates Ports in STP, which of the following is true – (Choose 2 answers)

a. All switches/bridges have only 1 Designated Port.
b. The Designated Port is used to forward the STP BPDU frame.
c. All the ports on the Root bridge/switch are Designated Ports.
d. The Designated Port cannot forward data frames.
e. Designated Ports are used to receive the BPDU.

Wireless Networking

In relation to wireless networks, which of the following is true – (Choose 2 answers)

a. All frames in Ad-Hoc networks must pass through an Access Point.
b. All frames in Infrastructure networks must pass through an Access Point.
c. All devices using the same SSID are in the same VLAN.
d. The SSID uses the same format as a MAC address.
e. An Access Point can only allow a maximum of one SSID.

In relation to frequency bands used in WLANS, which of the following is true – (Choose 2 answers)

a. The 2.4GHz band has more channels than the 5GHz band.
b. The 5 GHz band is less prone to interference from overlapping channels.
c. The 5 GHz band signal range travels further than the 2.4GHz range.
d. There is no overlap in Channels 1, 5, 10 in the 2.4GHz band.
e. There is no overlap in Channels 1, 6, 11 in the 2.4GHz band.

In relation to Wireless security, which of the following is true –

a. WPA2 Personal uses a pre shared key.
b. WEP is more secure than WPA2.
c. The pre shared key is the key used to encrypt all frames used by all devices in the same WLAN.
d. WPA2 Enterprise uses a pre shared key.

When using IEEE 802.1X for authentication, which of the following are true – (Choose 3 answers)

a. It is used in WPA2 Personal authentication.
b. It is used in WPA2 Enterprise authentication.
c. A pre shared key is used.
d. The client is the Authenticator.
e. The client is the Supplicant.
f. There is a centrally located Authentication Server.

When using IEEE 802.1X for authentication, which of the following is true –

a. The client can send data frames before being authenticated.
b. The client can only send EAP frames until authenticated.
c. The Authenticator has the list of authorised usernames and associated passwords.

d. The Authenticator has the list of authorised usernames but does not have the passwords associated with them.

Transport and Higher Layer Protocols

In relation to TCP, which of the following is true –

a. TCP does not use error correction.
b. In TCP, there is always a connection set-up before data is sent, known as the 3-way handshake.
c. In TCP, there is always a connection set-up before data is sent, known as the 4-way handshake.
d. When a client or server initiates a connection, the SYN and ACK flags are set to 1.

In relation to the use of Ports, which of the following are true – (Choose 3 answers)

a. Clients always use well known ports as Source Ports.
b. Servers mostly use well known ports as Source Ports.
c. Clients generally use dynamic ports as Source Ports.
d. A Socket consists of the device MAC address and IP address.
e. A Socket consists of the device IP address, whether it is using TCP or UDP and the Port number.
f. Port number 45192 is a well known Port.

In a TCP connection, the client sends 3 segments, each 1000 bytes long. The Sequence Number of the first segment is 1. Which of the following are true – (Choose 2 answers)

a. The Sequence Number in the second segment sent by the client is 2001.
b. The Sequence number in the third segment sent by the client is 2001.
c. The Acknowledgment Number sent by the server to acknowledge that all 3 segments were received correctly is 2001.
d. The Acknowledgment Number sent by the server to acknowledge that all 3 segments were received correctly is 3001.
e. The Acknowledgment Number sent by the server to acknlwledge that all 3 segments were received correctly is 4001.

In relation to UDP, which of the following is true –

a. UDP always uses error correction.
b. In UDP, there is always a connection set-up before data is sent, known as the 3-way handshake.

c. UDP is used when transmitting real time voice or video.
d. UDP is a reliable Transport Layer Protocol.

In relation to DNS, which of the following is true –

a. DNS matches IP addresses to MAC addresses.
b. DNS matches MAC addresses to Fully Qualified Domain Names
c. DNS matches IP addresses to Fully Qualified Domain Names.
d. DNS is used to dynamically assign IP addresses to Clients.

In relation to DHCP, which of the following are true – (Choose 2 answers)

a. DHCP is used to dynamically assign MAC addresses to Clients.
b. DHCP is used to match IP addresses to Fully Qualified Domain Names.
c. DHCP uses UDP as its Transport Protocol.
d. DHCP is used to assign an IP address and subnet mask to a Client.
e. DHCP is used to give a Client its default gateway IP address and the DNS Server IP address.

In relation to DHCP, which of the following is true –

a. DHCP relay is used on a router where the DHCP server is in the same LAN as the clients connected to the router.
b. DHCP relay is used on a router where the DHCP server is in a different LAN to the clients connected to the router.
c. DHCP relay is used by a switch where the DHCP server is in a different LAN to the clients connected to the switch.
d. DHCP relay is used by a switch where the DHCP server is in the same LAN as the clients connected to the switch.

Which of the following is the correct sequence of events when a client looks for an IP address from a DHCP Server –

a. Client Discover, Server Offer, Client Request, Server Acknowledge.
b. Client Request, Server Acknowledge, Client Discover, Server Offer.
c. Client Request, Server Offer, Client Discover, Server Acknowledge
d. Client Discover, Server Acknowledge, Client Request, Server Offer.

In relation to NAT which of the following are true – (Choose 3 answers)

a. NAT is used purely for security reasons.
b. NAT translates Fully Qualified Domain Names into IP addresses.
c. NAT translates Private IP addresses into Public IP addresses to use in Public networks.
d. NAT was created to address the scarcity of Public IP addresses.
e. When someone is using NAT over a Public network, they can be easily identified.
f. NAT increases processing time of an IP packet.

In relation to NAT overload/PAT, which of the following is true –

a. PAT is a one-to-one translation of Private to Public IP addresses.
b. PAT translates many Private IP addresses to less Public IP addresses using Port numbers.
c. PAT translates internal Private Port numbers into Public Port numbers.
d. PAT translates a single Private IP address into several Public IP addresses.

Network Security

In relation to Network security, which of the following is true –

a. Integrity means that a conversation between two users is private.
b. Confidentiality means that a message sent from one user to the other has not been tampered with.
c. Authentication means that the person sending the data is who they say they are.
d. Non-repudiation means a user cannot refuse a connection request from another user.

In relation to Symmetric Key encryption, which of the following is true –

a. Symmetric Key encryption uses one key for encryption and a different key for decryption.
b. Symmetric Key encryption uses the same key for encryption and decryption.
c. Symmetric Key encryption requires a lot of computer processing time.
d. RSA is an example of Symmetric Key encryption.

In relation to Asymmetric Key encryption, which of the following is true –

a. There is one single key used for encryption.
b. There are 2 keys, one private and the other public and when one of the keys is used to encrypt, the other is used for decryption.

c. Asymmetric Key encryption does not require a lot of computer processing time.
d. Asymmetric Key encryption is used to encrypt data when there is a greater flow of data towards one user than the other.

In a conversation between user A and user B, where KUA is A's Public key and KRA is A's Private key, KUB is B's Public key and KRB is B's Private key, the following message M is sent from A to B

A B

$E_{KUB}[M]$ =>

Which of the following is true –

a. The message authenticates A.
b. The message is confidential/private.
c. The Integrity of the message is verified.
d. B will use A's public key to decrypt the message.

In a conversation between user A and user B, where KUA is A's Public key and KRA is A's Private key, KUB is B's Public key and KRB is B's Private key, the following message M is sent from A to B

A B

$E_{KRA}[M]$ =>

Which of the following are true – (Choose 2 answers)

a. The message authenticates A.
b. The message is confidential/private.
c. The Integrity of the message is verified.
d. B will use A's public key to decrypt the message.
e. B will use his own public key to decrypt the message.

In relation to Hash functions, which of the following are true – (Choose 2 answers)

a. A Hash function encrypts data.
b. Hash functions generate an almost unique fixed message digest D from a variable length message M.
c. Hash functions are used to verify Integrity of a message.
d. If you know the message digest D, it is easy to recover the original message M.
e. Hash functions are used in Digital Signatures.

In relation to Digital Certificates, which of the following is true –

a. They are verified with a Digital Signature of the owner of the Certificate.
b. They are verified with a Digital Signature of the Certifying Authority.
c. They verify the financial standing of the owner of the Digital Certificate.
d. They protect the owner of the Digital Certificate from unwanted access.

In relation to security devices in networks, which of the following is true –

a. A Firewall can detect attacks from Viruses and Worms using a Signatures Database.
b. An Intrusion Prevention System can detect attacks from Viruses and Worms using a Signatures Database.
c. A DMZ is used to host untrusted devices.
d. A Firewall can block traffic with certain key words and phrases contained in the data.

Introduction to IPv6

In relation to IPv6, which of the following are true – (Choose 2 answers)

a. IPv6 was created to make the Internet more secure.
b. IPv6 uses Multicasts instead of Broadcasts.
c. IPv6 uses 128-bit addresses in Hexadecimal.
d. IPv6 uses 128-bit addresses in Decimal.

In relation to IPv6 addresses, which of the following is true –

a. All IPv6 addresses will be assigned to companies as /32 networks.
b. All IPv6 addresses will be assigned to companies as /48 networks.
c. All IPv6 addresses will be assigned to companies as /64 networks.
d. None of the above are true.

An IPv6 address is shown abbreviated as follows –
2001:1:1::1.
Which of the following is the full version of that IPv6 address –

a. 2001:1000:1000:0000:0000:0000:0000:1000
b. 2001:0001:0001:0000:0000:0000:0000:0001
c. 2001:1000:1000:0000:0000:0000:0000:0001
d. 2001:0001:0001:0000:0000:0000:0000:1000

In relation to IPv6 Unique Local Addresses, which of the following is true –

a. They are the equivalent to IPv4 Public IP addresses.
b. They are the equivalent to IPv4 IP Multicast addresses.
c. They are the equivalent to IPv4 Private IP addresses.
d. They are the equivalent to IPv4 Link Local IP addresses.