1. **Which of the following protocols are examples of TCP/IP transport layer protocols?**

   (Choose 2 answers.)

   o **UDP**

   o **TCP**

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

   o **Ethernet**

   o **HDLC**

3. **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?**

   o **Data encapsulation**

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

   o **Frame**

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

   o **Adjacent-layer interaction**

6. **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.)

   o **User mode**

   o **Enable mode**

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

   o **SSH encrypts all data exchange, including login passwords**

   o **Telnet encrypts nothing.**

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

    o **RAM**

9. **What command copies the configuration from RAM into NVRAM?**

    o **copy running-config startup-config**

10. **Which of the following is true about the enable secret command?**

    o **It forces you to enter a password when you go from user exec mode to privileged exec mode.**

11. **Which of the following is true in relation to configuring a switch or router?**

    (Choose 2 answers)

    o **When you configure the Console password, it is not automatically encrypted.**

    o **Using the services password-encryption will encrypt any unencrypted passwords.**

12. **Which of the following statements are true?**

    (Choose 2 answers)

    o **Half Duplex allows only one device at a time to transmit.**

    o **Hubs can only work in Half Duplex mode.**

13. **In relation to fibre which of the following statements are true?**

    o **Single mode uses laser to transmit.**

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

    o **1000BASE-T**

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

    o **Pins 1 and 2 on one end of the cable connect to pins 3 and 6 on the other end of the cable.**

16. **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.)

    o **PC and switch.**

    o **Router and hub.**

17. **Which of the following is true about the Ethernet FCS field?**

    o **Ethernet uses FCS for error detection.**

18. **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.)

    o **Broadcast address.**

    o **Multicast address.**

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

    o **It forwards out all interfaces in the same VLAN except for the incoming interface.**

20. **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?

    o **02CC.CCCC.CCCC was learned from the source MAC address of a frame that entered port Gi0/3.**

21. **In relation to switch which of the following are true?**

    o **All ports on a switch are in the same collision domain.**

22. **In relation to Hubs which of the following is true?**

    o **All devices connected to a hub are in the same collision domain.**

23. **In relation to switches, which of the following is true?**

    o **MAC Address tables are stored in CAM.**

24. **In relation to Switch port security, which of the following is true if Switchport security is enabled?**

    (Choose 2 answers)

    o **By default, the violation action is shutdown.**

    o **The second device that connects to the port causes a violation.**

25. **When you issue the following commands in a switch:**

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

    Which of the following is true?

    o **Sticky copies the first learned MAC address into NVRAM startup-config.**

26. **Which of the following is true about port security?**

    o **The default violation mode is Shutdown.**

27. **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?**

    o **The PC will connect at 10Mbs and half duplex to the switch.**

28. **In relation to a network with the Network ID 172.16.1.0/24, which of the following is true?**

    (Choose 3 answers)

    o **The first host is 172.16.1.1.**

    o **The last host is 172.16.1.254.**

    o **The broadcast is 172.16.1.255.**

29. **In relation to a network with the Network ID 192.168.1.32/27, which of the following is true?**

    (Choose 2 answers)

    ○ **The first host on this network is 192.168.1.33.**

    ○ **The last host on this network is 192.168.1.62.**

30. **In a PC, the default gateway is:**

    ○ **The address of the router connected to the PCs LAN.**

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

    ○ **255.255.255.240.**

32. **The subnet mask 255.255.224.0 translates to which Network Prefix?**

    ○ **/19.**

33. **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)

    ○ **All devices on this network share the same first 28 bits of the IP address.**

    ○ **This PC has an IP address in the range 192.168.1.17 to 192.168.1.30.**

34. **In relation to the ARP protocol, which of the following is true?**

    ○ **It is used to get a MAC address when an IP address is known.**

35. **In relation to an ARP table, which of the following is true?**

    ○ **It is used in a PC to map IP addresses to MAC addresses.**

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

    ○ **The host sends packets to its default gateway if the destination IP address is in a different subnet than the host.**

37. In relation to Classful IP addressing, which of the following is true?

(Choose 2 answers)

- o **126.1.1.1 is a Class A address.**
- o **126.1.1.1 belongs to a Classful network with a network mask of 255.0.0.0.**

38. In relation to Classful IP addressing, which of the following is true?

(Choose 2 answers)

- o **191.1.1.1 belongs to a Classful network with a prefix of /16.**
- o **191.1.1.1 is a Class B address.**

39. In relation to Unicasts, Multicasts and Broadcasts, which of the following are true?

(Choose 3 answers)

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

40. 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?

- o **From the subnet mask, count the number of host bits there are and set them all to 0.**

41. A device has an IP address of 192.168.10.40/28. Which of the following is true?

(Choose 3 answers)

- o **The Network ID is 192.168.10.32.**
- o **The last host is 192.168.10.46.**
- o **The broadcast for this network is 192.168.10.47.**

42. **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)

    ○ **There are a maximum of 14 hosts on this network.**

    ○ **The prefix for this network is /28.**

43. **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)

    ○ **The new subnet mask must be 255.255.255.224.**

    ○ **Each subnet will have a maximum of 30 hosts.**

    ○ **The Subnet ID of subnet 2 is 192.168.10.32.**

44. **Which of the following are true in relation to Private IP addresses?**

    (Choose 2 answers)

    ○ **10.255.255.1 is a Private IP address.**

    ○ **Private IP addresses were created because Public IP addresses were getting scarcer.**

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

    ○ **Destination IP address**

46. **When a router receives a packet, which of the following are true?**

    ○ **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.**

47. **When a router routes a packet, which of the following is true?**

    ○ **If a router finds more than one route match in a routing table, it picks the route with the longest match.**

48. **When a router routes a packet, which of the following is true?**

   (Choose 2 answers)

   - ○ **The router uses cost metrics to choose the best route to use.**
   - ○ **OSPF uses bandwidth as the cost metric.**

49. **Which of the following is true of Administrative Distance in a router?**

   - ○ **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.**

50. **In relation to Administration Distance in routers, which of the following is true?**

   - ○ **Administrative Distance ranks OSPF better than RIP.**

51. **In relation to Static Routing, which of the following is true?**

   - ○ **Static routing is used to tell a router about any networks not directly connected to that router.**

52. **A default static route does which of the following?**

   - ○ **Tells the router how to get to unknown networks that are not already in the routing table.**

53. **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)

   - ○ **The route is the default static route for the router or gateway of last resort.**
   - ○ **This route will cause a recursive lookup.**

54. **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 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.

    - 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.

55. **In relation to Static Routing, which of the following are true?**

    (Choose 2 answers)

    - You should only use next hop address when configuring static routes that use Gigabit Ethernet interfaces.

    - 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.

56. **Which of the following are functions of a routing protocol?**

    (Choose two answers.)

    - Advertising known routes to neighbouring routers.

    - Learning routes and putting those routes into the routing table for routes advertised to the router by its neighbouring routers.

57. **In relation to Distance Vector protocols which of the following is true?**

    - Distance Vector routing protocols involve a router telling all its neighbour routers about its own directly connected networks and they tell their neighbours.

58. **Which of the following is true in relation to OSPF and RIP?**

    - RIP uses hop count as a cost metric.

59. In relation to RIP which are true about the command:

R1(config-router)#network 10.0.0.0

(Choose 2 answers)

- o **Any interface with an IP address belonging to that network will be used for RIP updates.**
- o **Any subnet belonging to the 10.0.0.0/8 network will be advertised to neighbours.**

60. 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?

- o **Default-information originate**

61. Which of the following is true in relation to the command in RIP:

R1(config-router)#passive-interface g0/0/2

- o **This tells the router not to forward RIP updates on this interface as it is a LAN.**

62. 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?

- o **The subnet associated with interface fa0/0 will be advertised in OSPF.**

63. In relation to VLANs which of the following are true?

- o **All devices on the same VLAN are always in the same Broadcast domain.**

64. In relation to the IEEE 802.1Q protocol, which of the following are true?

(Choose 2 answers)

- o **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.**
- o **The Native VLAN is the only VLAN whose frames do not need a tag.**

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

- o **The router uses one physical interface to a switch and separate sub-interfaces on that interface for each VLAN required.**

66. 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?

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

67. Which of the following is true in relation to Inter VLAN routing?

- **A router can be replaced by a layer 3 switch.**

68. In relation to STP which of the following are true?

(Choose 2 answers)

- **STP is used to eliminate switching/bridging loops.**
- **The Bridge/switch with the lowest STP ID is elected the Root bridge.**

69. In relation to the role of Root Ports in STP, which of the following is true?

(Choose 2 answers)

- **All switches/bridges have only 1 Root Port.**
- **All switches/bridges have 1 Root Port except the Root bridge/switch which has none.**

70. In relation to the role of Designated Ports in STP, which of the following is true?

(Choose 2 answers)

- **The Designated Port is used to forward the STP BPDU frame.**
- **All the ports on the Root bridge/switch are Designated Ports.**

71. In relation to wireless networks, which of the following is true?

(Choose 2 answers)

- **All frames in Infrastructure networks must pass through an Access Point.**
- **The SSID uses the same format as a MAC address.**

72. In relation to frequency bands used in WLANS, which of the following is true?

(Choose 2 answers)

- **The 5 GHz band is less prone to interference from overlapping channels.**

- **There is no overlap in Channels 1, 6, 11 in the 2.4GHz band.**

73. In relation to Wireless security, which of the following is true?

- **WPA2 Personal uses a pre shared key.**

74. When using IEEE 802.1X for authentication, which of the following are true?

(Choose 3 answers)

- **It is used in WPA2 Enterprise authentication.**

- **The client is the Supplicant.**

- **There is a centrally located Authentication Server.**

75. When using IEEE 802.1X for authentication, which of the following is true?

- **The client can only send EAP frames until authenticated.**

76. In relation to TCP, which of the following is true?

- **In TCP, there is always a connection set-up before data is sent, known as the 3-way handshake.**

77. In relation to the use of Ports, which of the following are true?

(Choose 3 answers)

- **Servers mostly use well known ports as Source Ports.**

- **Clients generally use dynamic ports as Source Ports.**

- **A Socket consists of the device IP address, whether it is using TCP or UDP and the Port number.**

78. 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)

- The Sequence Number in the second segment sent by the client is 1001.

- The Acknowledgment Number sent by the server to acknowledge that all 3 segments were received correctly is 3001.

79. In relation to UDP, which of the following is true?

- UDP is used when transmitting real time voice or video.

80. In relation to DNS, which of the following is true?

- DNS matches IP addresses to Fully Qualified Domain Names.

81. In relation to DHCP, which of the following are true?

(Choose 2 answers)

- DHCP uses UDP as its Transport Protocol.

- DHCP is used to assign an IP address and subnet mask to a Client.

82. In relation to DHCP, which of the following is true?

- DHCP relay is used on a router where the DHCP server is in a different LAN to the clients connected to the router.

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

- Client Discover, Server Offer, Client Request, Server Acknowledge.

84. In relation to NAT which of the following are true?

(Choose 3 answers)

- NAT translates Private IP addresses into Public IP addresses to use in Public networks.

- NAT was created to address the scarcity of Public IP addresses.

- NAT increases processing time of an IP packet.

85. **In relation to NAT overload/PAT, which of the following is true?**

    o **PAT translates many Private IP addresses to less Public IP addresses using Port numbers.**

86. **In relation to Network security, which of the following is true?**

    o **Authentication means that the person sending the data is who they say they are.**

87. **In relation to Symmetric Key encryption, which of the following is true?**

    o **Symmetric Key encryption uses the same key for encryption and decryption.**

88. **In relation to Asymmetric Key encryption, which of the following is true?**

    o **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.**

89. **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: EKUB[M] =>

    Which of the following is true?

    o **The message is confidential/private.**

90. **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: EKRA[M] =>

    Which of the following are true?

    (Choose 2 answers)

    o **The message authenticates A.**

    o **B will use A's public key to decrypt the message.**

91. **In relation to Hash functions, which of the following are true?**

(Choose 2 answers)

- **Hash functions generate an almost unique fixed message digest D from a variable length message M.**
- **Hash functions are used to verify Integrity of a message.**

92. **In relation to Digital Certificates, which of the following is true?**

- **They are verified with a Digital Signature of the Certifying Authority.**

93. **In relation to security devices in networks, which of the following is true?**

- **An Intrusion Prevention System can detect attacks from Viruses and Worms using a Signatures Database.**

94. **In relation to IPv6, which of the following are true?**

(Choose 2 answers)

- **IPv6 uses Multicasts instead of Broadcasts.**
- **IPv6 uses 128-bit addresses in Hexadecimal.**

95. **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.
- **None of the above are true.**

96. **An IPv6 address is shown abbreviated as follows:**

2001:1:1::1.

Which of the following is the full version of that IPv6 address?

- **2001:0001:0001:0000:0000:0000:0000:0001**

97. **In relation to IPv6 Unique Local Addresses, which of the following is true?**

- **They are the equivalent to IPv4 Private IP addresses.**