Controlled Assignment (Duration 48 Hours)
SECTION A (60 marks)

**Select the correct response(s) to each of the following MCQs. <u>Choose all that apply.</u>**

Mail me you word-processed answers on <u>bcns21bpt@rishiheerasing.net</u> by the deadline.

1. Which layer of the OSI model does a LAN switch use to make a forwarding decision?
   a. OSI Layer 5
   b. Network Layer
   c. OSI Layer 2
   d. Forwarding Layer
   e. OSI Layer 4

2. In which situation(s) is/are links usually **NOT** assigned as Trunk?
   a. Client to Client
   b. Switch to Switch
   c. Switch to Router
   d. Server to Switch
   e. Router to Router

3. Communication between devices on different VLANs requires the use of which OSI layer?
   a. OSI Layer 2
   b. Data Link Layer
   c. Network Layer
   d. Application Layer
   e. VLAN Layer

4. A host receives a frame and discards it after detecting that it is corrupt. At which OSI layer are frames checked for errors?
   a. Data Link
   b. Physical
   c. Network
   d. Transport
   e. None of the above

5. Which of the following would **NOT** help in reducing network costs?
   a. Centralize Help Desks
   b. Automate as much as possible the network management function
   c. Installing several network security appliances.
   d. Developing different hardware and software configuration for client and servers
   e. Ensuring that all servers have their operating systems regularly updated.

6. Which of the following is/are **FALSE** about a **RAID 5** configuration?
   a. It needs a minimum of 3 hard disks to implement.
   b. The effective size of the array is the total size of each individual hard disks.
   c. It has excellent write performance
   d. It provides poor read performance
   e. None of the above

7. The size (S) of a LAN address, an IPv4 address, and an IPv6 address have the following property:
   a. S(LAN) < S(IPv6) > S(IPv4)
   b. S(IPv6) > S(LAN) < S(IPv4)
   c. S(IPv6) > S(IPv4) > S(LAN)
   d. S(IPv4) < S(LAN) > S(IPv6)
   e. None of the above

8. In which of the following situation(s) might a **differential backup** be **highly** recommended?
   a. When a large amount of data is being updated frequently
   b. When the amount of data to be backed up is very small
   c. When restore time has to be a minimum for mission critical applications
   d. When the frequency of backups is very low
   e. None of the above

9. What is the **optimal** best case and worst case scenario for **data loss** of a RAID 10 array with 5 HDDs:
   a. 5,1   b. 4,2   c. 5,2   d. 5,4   e. None of the above

10. Which of the above ports in the diagram on the right will be STP Designated Ports?
    a. V1: Port Fa0/0; V3: Port Fa0/0; V3: Port Fa0/24
    b. V1: Port Fa0/24; V2: Port Fa0/0; V2: Port Fa0/24
    c. V2: Port Fa0/24; V1: Port Fa0/0; V3: Port Fa0/24
    d. V1: Port Fa0/24; V2: Port Fa0/24; V2: Port Fa0/24
    e. None of the above
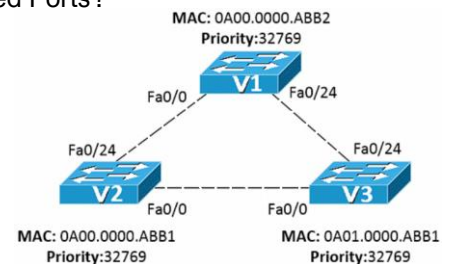
11. Which of the following best describe an address at Layer 2 of OSI model?
    a. MAC address
    b. Physical address
    c. Hardware address
    d. LAN address
    e. Ethernet address

12. Which type of address does a switch use to build the MAC/CAM table?
    a. Source MAC b. Source IP   c. Destination MAC   d. Destination IP   e. None of the above

13. What do you call a wireless Ethernet network in infrastructure mode with more than one access point?
    a. BSS   b. IBSS   c. ExNET   d. ESS   e. WESS

14. Which of the following best describe the function of a MAC address?
    a. It is used to physically locate a device on a network
    b. It is used to resolve domain name to IP address
    c. It is used to route packets across networks
    d. It is used to logically locate a device on a network
    e. None of the above

15. What is/are the function(s) of a Layer 2 Switch operating in Store-N-Forward mode?
    a. forwards data based on physical addressing
    b. duplicates the electrical signal of each frame to every port
    c. learns the port assigned to a host by examining the destination MAC address
    d. determines which interface to use to forward a frame based on the destination MAC address
    e. performs error detection on frames

16. Which of the following is/are true about the **IEEE 802.11ac** WLAN standard?
    a. It had a lower range compared to the other flavours
    b. It had 3 non-overlapping channels
    c. It operates solely in the 5 GHz frequency range
    d. It is backward compatible with the other flavours
    e. None of the above

17. Having entered https://www.google.mu in a browser, the page fails to display. Possible reasons could be:
    a. improper DNS configuration on the HTTP client
    b. congestion on the local area network of the client
    c. HTTP server is down
    d. web browser does not support HTTPS
    e. a firewall might be blocking the page

18. Which of the following can be the destination address in the header of a broadcast frame?
    a. 00:00:00:00:00:00
    b. 255.255.255.255
    c. FE:FE:FE:FE:FE:FE
    d. 127.0.0.1
    e. None of the above

19. Ring topologies are used because:
    a. Ring topology performs extremely well under heavy traffic
    b. Fairly easy to add or remove nodes in a ring topology
    c. Ring topology is relatively cheap to implement
    d. Ring topology provides exceptional redundancy
    e. None of the above

20. During the **encapsulation** process, what happens to data at Layer 3?
    a. The segment is placed into either an IPv4 or IPv6 datagram
    b. It stays in the form of data with some protocol info added to it
    c. The packet is placed into a frame containing the physical address
    d. It is encoded into bits and readied for transmission
    e. None of the above

21. A company is given the following address block: 99.98.97.96 /27. How many **usable host addresses** are available?
    a. 62
    b. 16
    c. 14
    d. 6
    e. 30

22. The **broadcast address** of the **2nd usable subnet** in Class B network where **10 bits are borrowed** is?
    a. x.x.0.141
    b. x.x.0.127
    c. x.x.255.63
    d. x.x.0.191
    e. x.x.255.127

23. Which of the following is/are **FALSE** with regards to WAN technologies?
    a. Frame Relay has a slowest throughput than any other wired WAN technology
    b. ADSL technology does not provide any throughput guarantee
    c. VSAT Technology is very popular in metropolitan areas.
    d. MPLS is technically a container for all types of Layer2 and 3 PDUs
    e. None of the above

24. Which of the following is/are **FALSE** with respect to VPN technology?
    a. Host-to-Host VPN require appropriate software to be installed on both hosts
    b. E-commerce has flourished because of SSL/TLS security
    c. IPSec Tunnel mode provides better security than Transport mode
    d. Host-to-Host VPN can use PPTP for implementing security
    e. None of the above

25. Which of the following is currently the most secure method of wireless encryption?
    a. WAP
   b. WPA2
    c. WEP
    d. WEP3
    e. WPA

26. A host broadcast an ARP request on the local network. How many ARP replies is it expected to receive?
   a. ARP replies from all the other hosts on the network
   b. Depend on how many hosts are on the local network
   c. None or only one
   d. Depends on the geometric size of the local network
   e. None of the above

27. Which of the following is/are **FALSE** about Layer 2 switches operating in Cut-Through mode?
   a. they have minimal switching delay
   b. they usually have less RAM on board
   c. they are used as workgroup switches
   d. they perform error-checking on frames
   e. None of the above

28. As data moves from the upper to the lower OSI layers, headers are _____?
   a. re-arranged
   b. modified
   c. added
   d. removed
   e. None of the above

29. The availability of a network component depends on which of the following:
   a. MTTR
   b. MTBF
   c. price
   d. failure rate
   e. uptime

30. A logical address is the identifier at the _____.
   a. network layer
   b. data-link layer
   c. transport layer
   d. application layer
   e. physical layer

[30x2 mark]

SECTION B (40 marks)

31. Assuming that forwarding tables are empty, give the forwarding tables of switches W, X, Y and Z after the 5 consecutive transmissions below:

   1. PC1 sends a frame to PC5
   2. PC7 sends a frame to PC3
   3. PC3 sends a frame to PC1
   4. PC4 sends a frame to PC3
   5. PC6 sends a frame to PC4
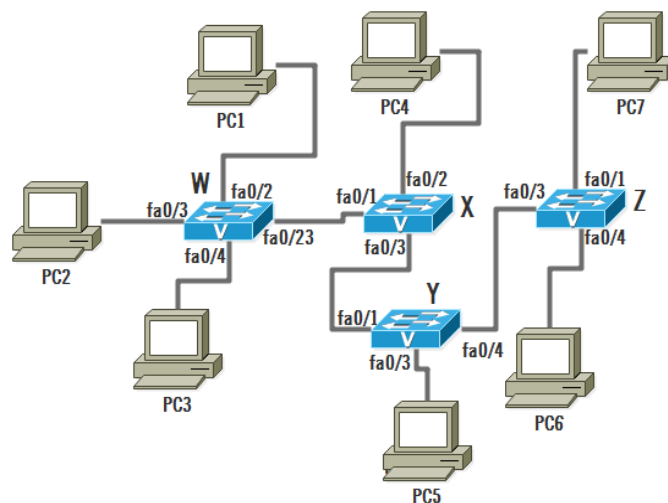
[10 marks]

32. Assume a 20-day month (4 weeks), calculate the monthly media space required for backing up 4 GB of daily data with a 10 % daily rate of change on the following modes:
a. Full backup (daily)
b. Differential backup (daily, Mondays to Thurdays) with full backup (on Fridays) per week
c. Incremental backup (daily, Mondays to Thurdays) with full backup (on Fridays) per week

[2+3+3 marks]

33. Given the capture below, extract the following info:

```
2c7b a06f 84bb 04b0 e7f6 85fb 0800 4554 003a 1a60 4000 3806
a5c3 6dec 5294 c0a8 011e 0015 c6ac b85d 22f0 b5d5 27b6 5018
00e5 cbd3 0000 3233 3420 4155 5448 2054 4c53 204f 4b2e 0d0a
```

a. Give the destination MAC address.

b. Give TTL value in decimal.

c. Give the source IP address in quad dotted decimal format.

d. Deduce the application layer protocol used.

e. Is this a request or response capture?

f. Decode as much as possible the application layer data?

[2+2+2+1+2+3 marks]

True or False (10x1 marks)

34. _____ TTL parameter is no longer needed in IPv6.
35. _____ The last three bytes of a MAC address identifies the Manufacturer or Vendor.
36. _____ A Local Area Network usually span over one hundred kilometres.
37. _____ RAID Level 1+0 usually provides more overall redundancy than Level 0+1.
38. _____ In a WLAN relay setup, the relay AP must be within range of the master AP.
39. _____ Minimum size of a full Ethernet II frame is 56 bytes.
40. _____ Broadcast storms often occur at the network layer.
41. _____ An optical fibre is an example of an unguided medium.
42. _____ A DOS attack can compromise the availability of a system.
43. _____ ASN.1 presentation layer service is not used exclusively by SNMP.

Total: 100 marks

*** END OF CONTROLLED ASSIGNMENT ***