Tertiary and Vocational Education Commission

NVQ Level 05 – Semester II

Information & Communication Technology

| Local Area Network – Theory | K72C001M08 | Three Hours |

Answer only 04 questions (Question no. 01 is COMPULSORY).

Question 01

One of a leading software development company wants to establish a new computer network for their office. This company is located in a multistoried building. Managing Director (MD) with his staff located in 4th floor and five programmers located in 5th floor.

By considering the following requirements, you should propose a computer network with minimum resources and the future expansions.

<u>Requirements</u>

   a) All the laptops should connect network through Wi-Fi
   b) All the Desktop computers, network printers and servers should have wired connection.
   c) Should provide internet facility to all staff through ADSL line.
   d) Currently MD's office uses two laptop computers, two Desktop computers and one network printer.
   e) In future, MD wants to recruits two Directors and gives them two laptops.
   f) Currently Programmers' office use one laptop, 4 desktops, one server and network printer.
   g) In future, MD wants to recruit three programmers with three desktops and one project manager with a laptop computer for Programmers' office.
   h) All the staff in MD's office wants to access server through LAN.
   i) Static IPs which are connected to the network used for all devises.

1) Make a list of network items with the quantities that are required to establish above network (use minimum resources). **(05 Marks)**
2) You are required to draw a network diagram by using star topology. That diagram should indicate device names and IP address. **(20 Marks)**

Question 02

   1) What are the layers of the OSI reference model? **(07 Marks)**

   2) Briefly explain OSI layer 02 and layer 03 **(06 Marks)**

3) Briefly explain, the benefit of the OSI model **(05 Marks)**

4) Briefly explain, TCP (Transmission Control Protocol) **(07 Marks)**

Question 03

1) List down three advantage and three disadvantage of using computer network
   (06 Marks)

2) What is the usage of following network tools; **(06 Marks)**
   a. Crimping Tool
   b. Punch down tool
   c. Cable tester

3) Briefly explain following terms ; **(08 Marks)**
   a. Default Gateway address
   b. Public IP address
   c. Private IP address
   d. MAC Address

4) What is a VLAN and how does it reduce the broadcast traffic? **(05 Marks)**

Question 04

The following picture shows the result of two ping commands use in command prompt screen.

```
C:. Command Prompt                                          —   □   ×

C:\Users\user>ping 192.168.100.1

Pinging 192.168.100.1 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.100.1:
    Packets: Sent = 4, Received = 0, Lost = 4(100% loss),

C:\Users\user>ping 192.168.100.9

Pinging 192.168.100.9 with 32 bytes of data:
Reply from 192.168.100.9: bytes=32 time<1ms TTL=128
Reply from 192.168.100.9: bytes=32 time<1ms TTL=128
Reply from 192.168.100.9: bytes=32 time<1ms TTL=128
Reply from 192.168.100.9: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.100.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\user>
```

1) Briefly explain the difference of the two ping command results.   **(06 Marks)**
2) What is meaning by **time** mentioned in above picture?   **(05 Marks)**
3) What are the differences between **Ipconfig** and **Ipconfig /all** commands?
                                                                          (06 Marks)
4) What are the differences between Switch and Router?   **(08 Marks)**

Question 05

1) Explain briefly, impotence of the IP Sub-netting.   **(04 Marks)**
2) Why we use subnet mask in networking?   **(04 Marks)**
3) Consider following IP address, you have to answer the following questions by clearly showing the steps).

   IP Address: **192.168.100.1/24**

   a. By using above IP address, create 8 subnetworks (Show the steps that you used)   **(08 Marks)**
   b. How many usable (Host) IPs available for each subnet?   **(04 Marks)**
   c. What is the Subnet Mask of the above subnetwork?   **(05 Marks)**