PK (2)

SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Information Technology

First Year, Second Semester Examination - 2018

HNDIT 1213 – Data Communication and Computer Networks

Instructions for the Candidates:
Answer any five questions.
All questions carry equal marks.

No of Pages: 04
No. of Questions: 06
Time: Three (03) hours

Question 01

(I) Define the term **"Computer Network"**. (03 Marks)

(II) Compare and contrast the **Analog** and **Digital Signals**. (06 Marks)

(III) Explain the two terms **Simplex** and **Half Duplex** with the help of a diagram. (04 Marks)

(IV) Write the command which you use to view **ip configurations** of a computer which runs windows operating system? (02 Marks)

(V) Write the answer for the following questions based on the Figure – A.

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Wireless LAN adapter Wireless Network Connection:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Local Area Connection:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::c33:41f3:607d:2175%11
   IPv4 Address. . . . . . . . . . . : 192.168.0.2
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.0.1

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::6849:2906:a923:f6a8%20
   Autoconfiguration IPv4 Address. . : 169.254.246.168
   Subnet Mask . . . . . . . . . . . : 255.255.0.0
   Default Gateway . . . . . . . . . :
```

Figure - A

i. What is the **IP address** of the computer? (02 Marks)

ii. What is the **network address** of the computer? (02 Marks)

iii. How many network connections are available? (01 Mark)

(Total =20 Marks)

Question 02

I. Draw a sinusoidal wave and illustrate **Amplitude** and **Period** on the same diagram.

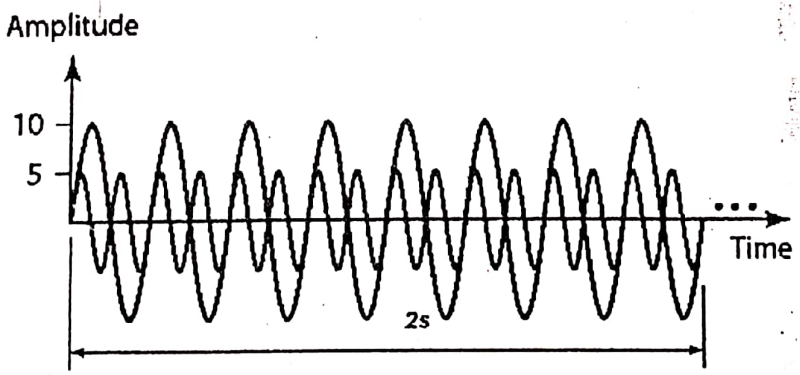
(04 Marks)

II. A signal transmitted over a channel has 50 Hz frequency. Calculate the **period** of the wave in milli seconds (ms). (Show all the units and equations used for your calculation.)

(06 Marks)

III. Following diagram shows a **Time Domain** representation of two **sine** wave signals. Considering the given information, draw the **Frequency Domain** representation of the two signals.

(06 Marks)



IV. A periodic signal is decomposed into six sinewaves with frequencies 150Hz, 200 Hz, 300 Hz, 600Hz, 900 Hz and 1200 Hz. Calculate the bandwidth of the signal.

(04 Marks)

(Total =20 Marks)

Question 03

I. Name three (03) **Transmission Impairments.** (03 Marks)

II. Define the term **Noise** and provide three (03) types of noises in communication links. (06 Marks)

III. Briefly explain **Peer – to – Peer** networks. (03 Marks)

IV. Write two (02) advantages of **Client Server Networks.** (04 Marks)

V. Draw a diagram and briefly explain two (02) network topologies. (04 Marks)

(Total =20 Marks)

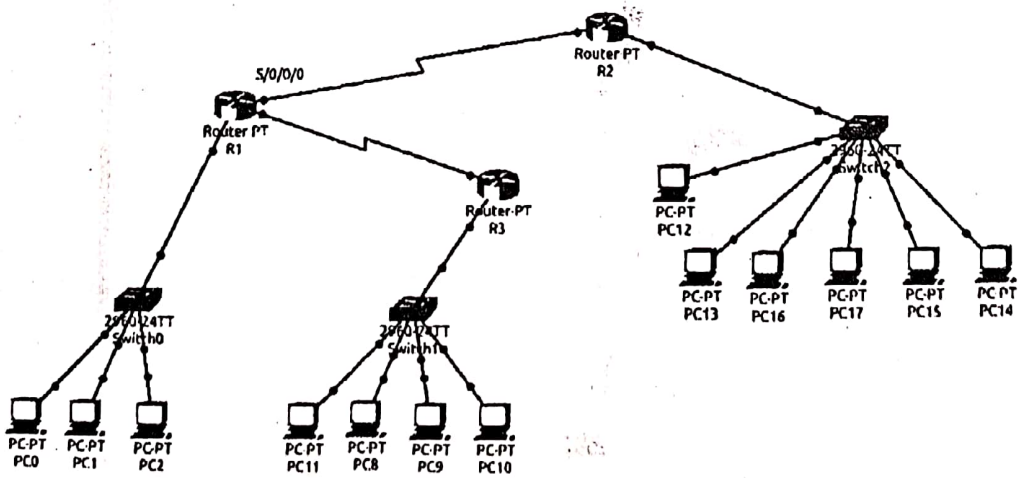
Question 04

I. List three (03) layers in **TCP/IP** model. (03 Marks)

II. Name the seven (07) layers of **OSI** model. (04 Marks)

III. Briefly explain the two terms **Unicast** and **Multicast**. (04 Marks)

IV. Consider the following diagram and assign suitable **ip addresses** for the devices shown in the diagram. (09 Marks)



(Total =20 Marks)

Question 05

I. Define the term **Protocol.** (02 Marks)

II. Briefly explain **Physical Address** and **Logical Address** in networking. (04 Marks)

III. Mention three (03) protocols used in networking and their port numbers. (06 Marks)

IV. Briefly explain the difference between **Switch** and **Hub**. (04 Marks)

V. Write four (04) advantages of **Fiber Optic** cables. (04 Marks)

(Total =20 Marks)

Question 06

I. Write default subnet masks of given IP addresses in **binary format**.

1. 191.215.3.7
2. 126.34.8.9 (02 Marks)

II. Write two (02) purposes of a **Router**. (02 Marks)

III. What is the role of **MAC Address** in computer network? (02 Marks)

IV. Write the answers to the questions asked in part (a – e) , by considering the IP address given in **CIDR** notation.

IP Address **176 . 224 . 112 . 230 / 26**

a) Default class of the above IP address (02 Marks)

b) Network address on this subnet (02 Marks)

c) Number of hosts on this subnet (02 Marks)

d) First host on this subnet (02 Marks)

e) Last host on this subnet (02 Marks)

f) Broadcast address on this subnet (02 Marks)

g) Number of subnetworks (02 Marks)

(Total = 20 Marks)