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 - 2019

HNDIT 1213 – Data Communication and Computer Networks

Instructions for the Candidates:	No of Pages: 04
Answer any five questions.	No. of Questions: 06
All questions carry equal marks.	Time: Three (03) hours

Question 01

(I) Computer networks can be broken down historically into topologies, briefly explain the term

"Network Topology". *Arrengement of computer* (02 Marks)
in a communication using data link

(II) Transmission mode refers to the mechanism of transferring data between two devices

connected over a network. Compare and contrast <u>Full Duplex</u> and <u>Half Duplex</u> communication

Same time full Duplex (04 Marks)
Half Duplex one time

(III) Write two advantages and disadvantages of Star Topology *easyly create & main* (04 Marks)
All pc are connect or main computer (nod

(IV) Draw the wiring diagrams of Cross over and Straight through cables. (04 Marks)

(V) Briefly explain the Guided and Unguided media with a suitable example. (06 Marks)

Gided (wired)   *Ungided (wireless)*
Coaxial cable   *micro waves*   **[Total Marks = 20 Marks]**
Crossover cable   *Radio wave.*
Fiber optic cable.   *Infored.*

Question 02

(I) Name two network related commands and their purposes which can be used to troubleshoot a
network. *IP Config /All*
(04 Marks)

(II) The Open System Interconnection Model (OSI) provides a standard for different computer

systems to be able to communicate with each other. Write the Seven layers of OSI Model.

Application
Presentation   (04 Marks)
Session
transport

(III) Define the term **"Subnet mask"**. (04 Marks)

(IV) 192.168.10.25/28 is an IP address assigned to a computer in a network. Write the answers for the following questions by considering the subnet which contains the given ip address. (08 Marks)

I. How many bits are allocated for the host side?

II. How many bits are allocated for the network side?

III. Calculate the network address for the above IP address.

IV. Write the IP address of first usable host in the network.

V. Write the last usable IP address of the networking

VI. what is the broadcast IP address of the subnetwork?

VII. How many host computers available in the subnetwork?

VIII. With the given subnet mask how many subnetworks can be created?

[Total Marks = 20 Marks]

Question 03

(I.) Analog modulation Is the representation of analog information by an analog signal. Name two Analog Modulation types used in data communication.

(02 Marks)

(II.) Write two advantages and disadvantages of a Computer Network (04 Marks)

(III.) 2.4MHz radio waves are used in radio communication (Wireless). Calculate the wavelength of the signal? Speed of radio waves is given by $3 \times 10^8 \text{ ms}^{-1}$. (04 Marks)

(IV.) Define the term "Protocol" with a suitable example. (04 Marks)

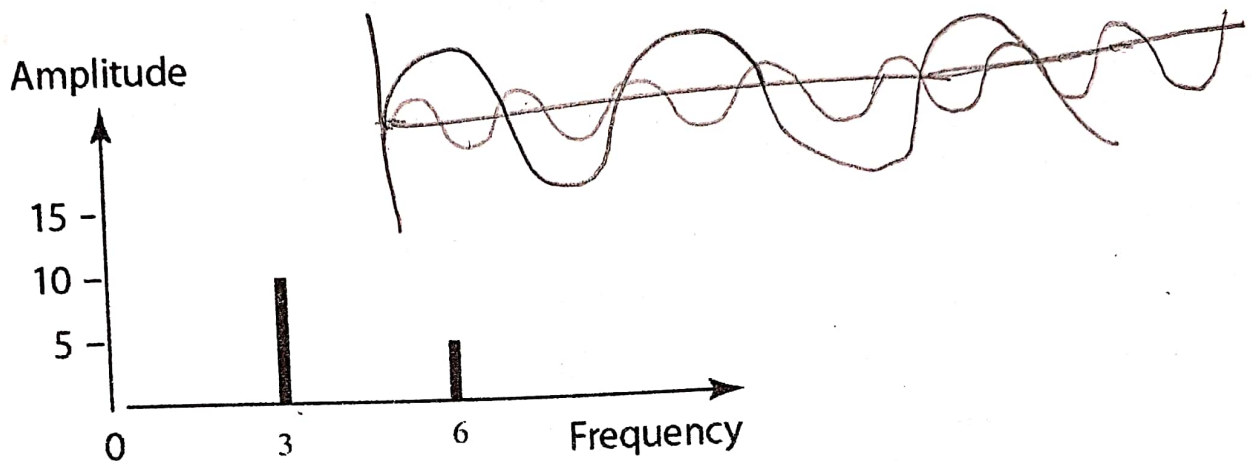(V.) Compare and contrast the two networking devices "Hub" & "Switch". (06 Marks)

[Total Marks = 20 Marks]

Question 04

(I.) Briefly explain the terms "Periodic" and "Non-Periodic" signals. (04 Marks)

(II.) The period of a signal is 100 ms. Calculate its frequency in kilohertz (kHz). (06 Marks)

(III.) following diagram shows a Frequency domain representation of two sin wave signals. Considering the given information draw the Time domain representation of the two signals.

(06 Marks)

(IV.) A periodic signal has a bandwidth of 200Hz. The highest frequency of the signal is 240Hz. Calculate the lowest frequency of the signal. (04 Marks)

[Total Marks = 20 Marks]

Question 05

When a signal is transmitted over a communication channel, it is subjected to different types of impairments because of imperfect characteristics of a channel. _is Noise Network_

(03 Marks)

(I) Define the term "Noise". _Unwanted high strength communication_

(II) Write three (03) types of **Noise** available in transmission media. _Short white Crosstalk_ (03 Marks)

(III) Briefly explain the term "Distortion" with a suitable diagram. (04 Marks)

(IV) Briefly explain term "Digital Signal" with a suitable diagram. (04 Marks)

(V) Briefly explain three (03) functions performed by a Router. _Assign IP Address. Manage internet conne devices Provide stable Connecti Network_ (06 Marks)

[Total Marks = 20 Marks]

Send packet & send response

TCP (IP)
UDP

Question 06

(I) Define the term "Error Detection" and "Error Correction" (04 Marks)

(II) Briefly explain two protocols used in Email communication. (04 Marks)

(III) Compare and contrast the **Logical Address** and **Physical Address**. (06 Marks)

(IV) Briefly explain three (03) duties of **Data link Layer**. (06 Marks)

Provide hop to hop Connection

[Total Marks = 20 Marks]

Pin