ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
(Department of Computer Science)

WARNING

1. **PLAGIARISM OR HIRING OF GHOST WRITER(S) FOR SOLVING THE ASSIGNMENT(S) WILL DEBAR THE STUDENT FROM AWARD OF DEGREE/CERTIFICATE, IF FOUND AT ANY STAGE.**
2. **SUBMITTING ASSIGNMENTS BORROWED OR STOLEN FROM OTHER(S) AS ONE'S OWN WILL BE PENALIZED AS DEFINED IN "AIOU PLAGIARISM POLICY".**

Course: Data Communication (3413)

Level: Bachelor **Semester: Spring, 2013**

Total Marks: 100

ASSIGNMENT No. 1

Note: All questions carry equal marks.

Q.1 Describes the characteristic of analog and digital signals communication.

Q.2 What is data transmission? Elaborate the tasks carried out during communication.

Q.3 What are communication impairments? Also explain the disadvantages of communication impairments.

Q.4 Define data encoding. Also explain any three types of encoding techniques in detail.

Q.5 Discuss the characteristics of terrestrial microwaves carrier in detail.

ASSIGNMENT No. 2

Total Marks: 100

Note: All questions carry equal marks.

Q.1 Elaborate the interfacing technique. Explain the configuration in detail.

Q.2 What is flow control? Also explain the error in flow controlling process.

Q.3 Describe the important features of fast and high speed Ethernet in detail.

Q.4 Define WAN services. Also describe the techniques used by ATM and frame relay.

Q.5 Enlist the major causes of disaster in network system. Also explain the system failure protection techniques.

3413 Data Communication — Credit Hours: 4(4 + 0)

Recommended Book:
Data and Computer Communication by William Stallings

Course Outlines:

Unit No.1 Data Transmission & Networking Concepts

Communication Model and Communication Tasks, Transmission System Utilization, Interfacing & Signal Generation, Exchange Management, Error Detection and Correction, Flow Control, Addressing, & Routing, Recovery, Message Formatting, Security, Network Management Protocol and Protocol Architecture, OSI Standard ,TCP/IP Suite, Bus, Tree, Ring, Star LANs, Circuit Switching And Packet Switching, Frame Relay and ATM, ISDN and Broadband ISDN, Point to Point and Multipoint, Simplex, Half-Duplex and Full-Duplex Transmission, Analog and Digital Data Transmission

Unit No.2 Signal Fundamentals and Transmission Impairments

Basics of Signals, Time Domain and Frequency Domain, Attenuation, Delay Distortion, Noise and Channel Capacity

Unit No.3 Transmission Media

Guided Transmission Media – Twisted Pair, Coaxial Cable and Optical Fiber, Unguided Transmission Media – Terrestrial & Satellite Microwave and Broadcast Radio, Practical *

Unit No.4 Data Encoding

Digital Data & Digital Signals, Encoding Techniques (NRZ-L, NRZI, Bipolar Ami, Pseudo ternary, Manchester, Differential Manchester), Digital Data & Analog Signals–Modem Encoding Techniques (ASK, FSK, PSK, QPSK), Analog Data & Digital Signals–Code Encoding Techniques (PCM, TDM), Modulation Techniques (Am, Fm, Pm)

Unit No.5 Data Communication Interface and Multiplexing

Asynchronous and Synchronous Transmission, Line Configurations, Interfacing, Null Modem, Frequency Division, Multiplexing, Synchronous and Statistical Time Division Multiplexing

Unit No.6 Data Link Control

Flow Control Techniques – Stop & Wait, Sliding Window, Error Detection (Even and Odd Parity Check, CRC or FCS), Error Control Techniques (Stop And Wait ARQ, Go-Back-N ARQ, Selective-Reject ARQ, High Level Data Link Control Protocols (HDLC))

Unit No.7 LAN Technologies and Systems

LAN Architecture, Ethernet and Fast Ethernet LANs (CSMA/CD), Token Ring Network, FDDI, High Speed Ethernet (Gigabit LANs)

Unit No.8 Inter network Devices and WAN Services

Switch, Bridge, Router, Circuit Switching Network, Packet Switching Network, ISDN Links, ATM and Frame Relay

Unit No.9 Disaster Recovery and System Configuration

Disaster Recovery, Data Protection Techniques, System Failures Protection Techniques, System Configuration, Installing and Configuring Network devices (Modem and NIC), Network Configuration and Administration, Practical **

*** The institution should arrange the following to make and test UTP Cable from the students used in Star topology**

a) Direct Cable b) Cross over Cable

**** The Institution should arrange the following labs:**

a) Install network OS and configuration of Network devices
b) Managing user accounts and user rights