ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD

(Department of Computer Science)

WARNING

1. PLAGIARISM OR HIRING OF OTHER WRITER(S) FOR SOLVING THE ASSIGNMENT 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 **Semester: Spring, 2014**
Level: Bachelor **Total Marks: 100**

ASSIGNMENT No. 1

Units (-)

Note: All questions carry equal marks.

Q. 1 Discuss the features of communication model and also describe the purpose of various communication tasks? **(20)**

Q. 2 Define the characteristics of signal? Differentiate time and frequency domain. What is the difference between guided and unguided transmission media? **(20)**

Q. 3 What is communication protocol? Explain the OSI stack model in detail with example? **(20)**

Q. 4 Write short note on each of the following: **(20)**

- Attenuation
- Delay distortion
- Coaxial Cable
- Optical Fiber

Q. 5 Differentiate digital data and digital signal? Also explain terrestrial & Satellite Microwave in detail. **(20)**

ASSIGNMENT No. 2

Semester: Spring, 2014 **Total Marks: 100**

(-)

Note: All questions carry equal marks.

Q. 1 What is LAN Network? Explain different types of LAN topologies in detail with examples. **(20)**

Q. 2 Discuss the characteristics of asynchronous and synchronous transmission in detail? Also explain different types of multiplexing. **(20)**

Q. 3 What is flow control techniques? Also define error detection and error control techniques. **(20)**

Q. 4 Define LAN architecture. Also describe CSMA/CD and Gigabit LANs. **(20)**

Q. 5 Write short notes on the following with respect to their functionality: **(20)**

- Passive and Active Switch
- B-Router
- Passive and Active Bridge
- Proxy Server

DATA COMMUNICATION

Course Code – 3413

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 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, Practcial*.

Unit No.4: **Data Encoding**

Digital Data & Digital Signals, Encoding Techniques (NRZ-1, NRZ1, Bipolar Ami, Pseudo ternay, 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