Annexure No.	31 P
SCAA Dated	29.02.2008

BHARATHIAR UNIVERSITY : COIMBATORE

POST GRADUATE DIPLOMA IN ADVANCED NETWORKING
For School of Distance Education

(For the students admitted during the Academic Year 2007-2008)

Scheme of Examinations

Year	Subject and Paper		University Examinations	
			Durations in Hrs	Max Marks
I	Paper I	Data and Computer Communication	3	100
	Paper II	Introduction to Computer Networks	3	100
	Paper III	Internetworking with TCP/IP	3	100
	Paper IV	Network Programming	3	100
	Practical	Computing Lab- Unix Network Programming Lab	3	100
		Total		500

Paper I : DATA AND COMPUTER COMMUNICATION

Subject Description : This subject deals with data and Computer Communication
Goal : To enable the students to understand the concepts of data and computer communication
Objective : On completion of this course the students should have
- o understood the concepts of communication
- o fundamentals of data encoding

UNIT I
ANALOG COMMUNICATION : Linear CW Modulation : Band Pass Systems and Signals - Double-Sideband Amplitude Modulation - Modulators and Transmitters - Suppressed-Sideband Amplitude Modulation - Frequency Conversion and Demodulation - Problems.

UNIT II
DIGITAL COMMUNICATION: Pulse code modulation – Compounding – Differential PCM – Delta modulation – ASK, PSK, FSK schemes - Differential phase shift keying – Quadrates phase shift keying Noise in communication systems

UNIT III
DATA TRANSMISSION: The Computer-Communications Revolution - A Communications Model - Data Communications - Data Communication Networking - Computer Communications Architecture - Standards Making Organizations.

UNIT IV
DATA ENCODING: Concepts and Terminology - Analog and Digital   Data Transmission - Transmission Impairments -Transmission Media. Data Encoding : Digital Data , Signals- Digital Data, Analog Signals - Analog Data, Digital Signals - Analog Data, Analog Signals. Digital Data Communication: Asynchronous and Synchronous Transmission - Error Detection Techniques - Interfacing.

UNIT V
DATA LINK CONTROL: Line Configurations - Flow Control - Error Control - Data Link Control Protocols. Multiplexing: Frequency - Division Multiplexing - Synchronous Time-Division Multiplexing - Statistical Time-Division Multiplexing.

Reference Books :
1. William   Stallings, ' Data and Computer   Communications' PEARSON EDUCATION ASIA, 2002.
2. Unless Blake' Computer networks', PHI, 2000

Paper II : **INTRODUCTION TO COMPUTER NETWORKS**

Subject Description : This subject deals with the Fundamental of Computer Networks
Goal : To enable the students to understand the concepts of Networking Technology
Objective : On completion of this course the students should have
- o understood the concepts of Networking
- o learnt various layers of Computer Networks

UNIT I
Introduction: Use of computer networks – Network Hardware – Network software – Reference models – Example of networks.

UNIT II
The Physical Layer: The Theoretical basis for data communication – Guided transmission Media – Wireless transmission – Communication satellites – The Public switched Telephone network – Cable Television - Mobile telephone system.

UNIT III
Data link layer :Data link layer design issues – Error detection and correction – Elementary data link protocols – Sliding window protocols – Protocol Verification- Example data link Protocols.

UNIT IV
Network layer :Network layer design issues – Routing algorithms – Congestion, Control algorithms – Quality of service – Internetworking – Network layer in the internet

UNIT V
Transport layer: The transport service – Elements of transport protocol – A simple transport protocol - The internet Transport Protocols : UDP – The Internet Transport Protocols : TCP-Performance issues.

Reference Books :
1. Andrew S. Tanenbaum, "Computer Networks", IV Edition, Pearson Education,
2. P. Green – Computer Network Architectures and Protocols, Plenum Press, 1982.
3. Harry Katzan – An Introduction to "Distributed Data Processing", A Petrocelli Book, New York / Princeton.
4. Tittel – Theory and Problems of Computer Networking, Schaum's outline series, TMH.
5. Godbole – Data Communication & Networking, TMH.
6. Leon Garcia – Communication Networks : Fundamental Concepts & Key Architecture, TMH.

Paper III : INTERNETWORKING WITH TCP/IP

Subject Description : This subject deals with the Fundamental of Internetworking
Goal : To enable the students to understand the concepts of Internetworking Technology
Objective : On completion of this course the students should have
- understood the concepts of Internetworking
- learnt various aspects of TCP/IP

UNIT I

Underlying Network technologies – Two Approaches to network communication – wide area and local area networks – Ethernet technology – FDDI - Asynchronous Transfer mode – WAN Technologies: ARPANET – National Science Foundation Networking – ANSNET – vBNS – other technologies. – Internetworking concept and architectural model – application-Level interconnection - Network-Level interconnection – properties of the internet – internet architecture – Interconnection Trhough IP Routers - The user's view – all networks are equal – the unanswered questions.

UNIT II

Classful internet addresses – Mapping Internet Address to Physical Address (ARP) – Determining an Internet Address (RARP) – Classless and Subnet Address Extensions (CIDR) – Internet Multicasting.

UNIT III

Internet protocol: connectionless datagram delivery – Internet Protocol: Routing IP Datagrams - Internet Protocol: Error and Control Messages (ICMP)

UNIT IV

Protocol Layering – User datagram protocol (UDP) – Reliable Stream Transport Service (TCP).

UNIT V

Private Network Interconnection (NAT, VPN) – Client/Server Model of Interaction – The Domain Name System (DNS).

Reference Book :

Douglas E.Comer, "Internetworking with TCP/IP", Pearson Education Asia, 2001.

Paper IV : NETWORK PROGRAMMING

Subject Description : This subject deals with the Concepts of Network Programming
Goal : To enable the students to understand the fundamentals of Network Programmingg
Objective : On completion of this course the students should have
> o understood the concepts of Network Programming

UNIT I
Introduction – basic Definition – input and output – signals – process control – daemon processes – files & record – locking – pipes – FIFOS – streams and messages – semaphores – shared memory – socket & TLI.

UNIT II
Communication protocols : TCP/IP – the internet protocols – XNS – Xerox Network Systems – SNA – Systems network architecture – NetNIOS – OSI protocols – UUCP – unix – to – unix copy – protocol comparison.

UNIT III
Berkeley sockets : Unix domain protocols – socket addresses – elementary socket system calls – a simple example – advanced socket system calls – reserved ports – stream pipes – passing file descriptors – socket options – a synchronous I/O – I/O Multiplexing – Out of Band data – socket & signals – internet super server – socket implementation

UNIT IV
Transport endpoint addresses – elementary TLI functions – advanced TLI functions – Stream TLI Implementation – Stream pipes – passing file descriptors – Asynchronous I/O – out of band data.

UNIT V
Ping Routines : Internet ping client – XNS Echo client – trivial file transfer protocol – security – data formats – connections – client user interface – UDP implementation – TCP implementation
Remote Login : terminal line disciplines – Pseudo – terminals – terminal modes – control terminals – rlogin overview – windowing environments – pseudo – terminal packet mode – rlogin client – rlogin server.

Reference Book :
W. Richard Stevens, "Unix Network Programming", PHI, New Delhi, 1992.

Practical - Computing Lab – Unix Network Programming Lab

1. Write a Program to find the Ethernet address of a system
2. Write a Program to use or access a remote hard disk or remote floppy disk
3. Write a Program to send a message to a remote system
4. Write a Program to broadcast message to all the system
5. Write a Program to chat between two users in the same system and different system
6. Write a Program to mail to your local user through signals
7. Write a Program to install your own software to a remote system