UNIVERSITY OF CALICUT

(Abstract)

Scheme and Syllabus of M.Sc Electronics of affiliated colleges under Credit Semester System (CUCSS-PG-2010) implemented with effect from 2010 admission-orders issued.

GENERAL & ACADEMIC BRANCH-IV 'J' SECTION

No. GA IV/J1/4336/10 Dated, Calicut University PO, 30.07.2010

Read: 1. U.O.No.GAIV/J1/1373/08 dated 23.07.2010.
2. Minutes of the meeting of the Board of Studies in Electronics of 10.06.2010.
3. Orders of the Vice-Chancellor in the file of even No. dated 24.07.2010.

O R D E R

As per reference cited (1) above, Credit Semester System at Post Graduate level in affiliated colleges (CUCSS-PG-2010) has been implemented from the Academic year 2010 onwards.

The Board of Studies at its meeting, vide reference cited (2) above discussed the scheme and syllabus of M.Sc.Electronics programme of affiliated colleges under Credit Semester System and decided to implement CUCSS-PG for the M.Sc.Electronics programme from the Academic year 2010-11 onwards with a total of 80 credits for the entire Post Graduate programme.

The Vice-Chancellor, in view of exigency, has approved the minutes of the meeting of the Board, subject to ratification by the Academic Council.

Sanction has therefore been accorded to implement the scheme and syllabus of M.Sc.Electronics of affiliated colleges under Credit Semester System with effect from 2010 admission.

Orders are issued accordingly. Scheme and Syllabus appended.

Sd/-
DEPUTY REGISTRAR(G&A IV)
For REGISTRAR

To

1. The Principals of all affiliated Colleges offering M.Sc.Electronics.
2. Self financing centres of the University of Calicut offering Electronics (PG)

Copy to:

PS to VC/PA to Registrar/CE/Digital wing (with a request to upload in the University website)/Enquiry/Information Centres/DR III(Exams)/EG-I/DR PG/Tabulation Section/GA I 'F' 'G' sections/GAII/GAIII/SF/FC

Forwarded/By Order

SECTION OFFICER

Desktop/Saji/J14336

University of Calicut

M.Sc. Electronics Course Structure, Scheme & Syllabus

(Credit Semester System 2010 Admission onwards)

I Semester

Course	Course Code	Course Title	Exam Duration	Internal (%)	External (%)	Credits
Core	AM1C01	Applied Mathematics	3 Hrs	25	75	4
Core	MM1C02	Microprocessor & Microcontroller Applications	3 Hrs	25	75	4
Core	DC1C03	Modern Digital and Optical Communication	3 Hrs	25	75	4
Core	DS1C04	Advanced Digital System Design	3 Hrs	25	75	4
Practical	CP1P01	Computer Programming Lab (Experiments in Numerical Methods and Program in C^{++} & Java	3 Hrs	25	75	4
					Total Credits	20

II Semester

Course	Course Code	Course Title	Exam Duration	Internal (%)	External (%)	Credits
Core	HP2C01	High Performance Communication Networks	3 Hrs	25	75	4
Core	CM2C02	Cellular Mobile Communication	3 Hrs	25	75	4
Core	MC2C03	Multimedia Compression Techniques	3 Hrs	25	75	4
Core	AI2C04	Artificial Intelligence	3 Hrs	25	75	4
Practical	MP2P02	Microprocessor & Microcontroller Lab	3 Hrs	25	75	4
					Total Credits	20

III Semester

Course	Course Code	Course Title	Exam Duration	Internal (%)	External (%)	Credits
Core	ES3C01	Embedded Systems	3 Hrs	25	75	4
Core	DP3C02	Advanced Digital Signal Processing	3 Hrs	25	75	4
Core	VL3C03	VLSI Design, Tools & Technology	3 Hrs	25	75	4
	Electives (Choose any one)					
Core	CA3E01	Computer Architecture & Parallel Processing	3 Hrs	25	75	4
Core	MI3E02	Microwave Integrated Circuits	3 Hrs	25	75	
Core	I I 3 E03	Industrial Instrumentation & Automation	3 Hrs	25	75	
Core	SC3E04	Satellite Communication	3 Hrs	25	75	
Practical	CD3PO3	Communication & DSP Lab	3 Hrs	25	75	4
					Total Credits	20

IV Semester

Course	Course Code	Course Title	Exam Duration	Internal (%)	External (%)	Credits
Core	NN4C01	Neural Networks & Applications	3 Hrs	25	75	4
	Electives (Choose any one)					
Core	RO4E01	Robotics	3 Hrs	25	75	4
Core	DR4E02	Digital Communication Receivers	3 Hrs	25	75	
Core	TE4E03	Telematics	3 Hrs	25	75	
Core	QC4E04	Quantum Computing	3 Hrs	25	75	
	EP4Pr01	Project		25	75	4
	EV4VO1	Viva Voce		25	75	4
					Total Credits	16

TOTAL CREDITS 76

SEMESTER - I

AM1 C 01 APPLIED MATHEMATICS

(Cridets-4)

Numerical Methods

Solution of algebraic and transcendental equations: Bisection method -Secant method – Newton - Raphson method. Solution of simultaneous algebraic equations: Gauss elimination method – Gauss Jordan method – Gauss - Seidal method. Numerical Solution of boundary value problem: Laplace's equation

The Wave Equations

Solution of initial and boundary value problems- Characteristics- D'Alembert's Solution - Significance of characteristic curves - Laplace transform solutions for displacement in a long string;- a long string under its weight - a bar with prescribed force on one end- free vibrations of a string.

Special functions

Series solutions- Bessel's equation - Bessel Functions-Legendre's equation - Legendre polynomials - Rodrigue's formula - Recurrence relations- generating functions and orthogonal property for Bessel functions of the first kind - Legendre polynomials.

Probability and random Variables

Probability Concepts -Random Variables, Moment generating function - standard distributions- Two dimensional random variables- Transformation of Random Variables - Correlation - Regression system - queuing applications.

Queuing Theory

Single and Multiple server Markovian queuing models - customer impatience - Priority queues - M/G/1 queuing system - queuing applications.

Text & Reference Books:

1. *Sankara Rao.K. "Introduction to Partial Differential Equation", PHI, 1995.*
2. *Taha. H.A., "Operations Research- An Introduction" 6th Edition, PHI, 1997.*
3. *Churchil. R.V., "Operational Mathematics", McGraw Hill, 1972.*
4. *Richard A.Johnson, Miller and Freund's Probability and Statistics for Engineers, 5th Edition, PHI, 1994.*
5. *S.Narayanan, T.K.Manickvachagam Pillay and G.Ramanaiah- Advanced Mathematics for Engineering Students - Vol.II, S.Viswanathan Pvt. Ltd., 1986.*
6. *Numerical Analysis – Santa Kumar.*
7. *Numerical Méthods – Yengar & Jain*

MM1 C 02 **MICROPROCESSOR & MICROCONTROLLER APPLICATIONS**

(Cridets-4)

Interfacing Peripherals and Applications:

Parallel I/O and Interfacing applications, Interrupts and Interrupt service procedures, 8085 interrupts,8086 Interrupts and responses,

Digital Interfacing:

Programmable Interface devices-8155/8156,8355/8755, 8279, General purpose Programmable Peripheral Devices: 8255A, 8253,8259A, DMA and DMA Controller, interfacing with high power devices, Analog Interfacing and Industrial control, sensors and transducers, Interfacing Data converters, Industrial process control, 8086 based control systems.

Enhanced 8051 features

Programming 8051 and software, Real time OS, Application examples: RS232 Interface, PWM motor control, Ultrasonic distance measuring

PC Interfacing Applications

[12]

Interfacing using RS232 and USB

Text & Reference Books :

1. *Microprocessor Architecture, Programming and Applications with 8085/8080A: Gaonkar, Wiley Eastern*
2. *Microprocessor Interfacing: Douglas Hall, McGraw Hill*
3. *The 8088 and 8086 Microprocessors: Programming, Interfacing, Software, Hardware and Applications, 3rd Ed., Walter Triebel and Avtar Singh, 2000, Prentice Hall.*
4. *Lab Manual to Accompany The 8088 and 8086 Microprocessors, 3rd Ed, Walter Triebel and Avtar Singh, 2000, Prentice Hall.*
5. *The 8051 Microcontroller and Embedded Systems, Muhammad Mazidi and Janice Mazidi, 2000, Prentice Hall.*

DC1 C 03 MODERN DIGITAL & OPTICAL COMMUNICATION

(Cridets-4)

Network hardware and Software

LAN, MAN, WAN, Wireless and Internetworks, protocol hierarchies, design issues for the layers, interfaces and services, connection oriented and connectionless services .OSi reference model, TCP/IP model, comparison

Different Layers and their functions

Physical Layer, Data Link Layer: Services provided to Network layer, Medium Access Sublayer, Elementary ideas of framing, Network and Transport layers

LAN Hardware and components

Bound and Unbound media and its specifications, Switches and Hubs, Bridges and Routers. Structured cabling and Passive components.

Optical Link Design

BER calculation, quantum limit, power penalties

Optical Switches

Coupled mode analysis of directional couplers, Electro optic switches

Non-linear effects in Fiber optic links

Concept of self phase modulation, group velocity dispersion and soliton based communication. Optical amplifiers- EDFA, Raman Amplifier and WDM systems.

Text & Reference Books

1. J. Keiser, Fiber Optic communication, McGraw Hill, 2nd Edition 1992
2. J. E.Midwinter, Optical Fibers for Transmission, John Wiley 1979
3. H. Dutton, Understanding Optical Communications, Prentice Hall
4 *B.P. Lathi, Modern digital and analog communication systems*
5 *Proakis J.J., Digital Communications, McGraw Hill*
6 *A.S. Tanenbaum, "Computer Networks", PHI*

DS1 C 04 ADVANCED DIGITAL SYSTEM DESIGN

(Cridets-4)

Advanced topics in Boolean Algebra

Shannon's expansion theorem, Consensus theorem, Octal designation, Run measure, INHIBIT / INCLUSION / AOI / Driver / Buffer gates, Gate expander, Reed Muller expansion, Synthesis of multiple output combinational logic circuits by product map method, Design of static hazard free and dynamic hazard free logic circuits.

Threshold Logic

Linear seperability, Unateness, Physical implementation, Dual comparability, Reduced functions, Various theorems in threshold logic, Synthesis of single gate and multigate threshold Network.

Symmetric Functions

Linear seperability, Unateness, Physical implementation, Dual comparability, Reduced functions, Various theorems in threshold logic, Synthesis of single gate and multigate threshold Network. Elementary symmetric functions, Partially symmetric and totally symmetric functions, Mc Cluskey decomposition method, Unity ratio symmetric ratio functions, Synthesis of symmetric function by contact networks.

Sequential Logic Circuits

Mealy machine, Moore machine, Trivial / Reversible / Isomorphic sequential machines, State diagrams, State table minimization, Incompletely specified sequential machines, State assignments, Design of synchronous and asynchronous sequential logic circuits working in the fundamental mode and pulse mode, Essential hazards Unger's theorem.

Programmable Logic Devices

Basic concepts, Programming technologies, Programmable Logic Element (PLE), Programmable Logic Array (PLA), Programmable Array Logic (PAL), Structure of Standard PLD's, Complex PLD's (CPLD). System Design Using PLD's - Design of combinational and sequential circuits using PLD's, Programming PAL device using PALASM, Design of state machine using Algorithmic State Machines (ASM) chart as a design tool. Introduction To Field Programmable Gate Arrays - Types of FPGA, Xilinx XC3000 series, Logic Cell array (LCA), Configurable Logic Blocks (CLB) Input/Output Block (IOB)- Programmable Interconnect Point (PIP). Introduction to Actel ACT2 family and Xilinx XC4000 families, Design examples.

Text & Reference Books:

1. *William I. Fletcher, "An Engineering Approach to Digital Design", Prentice Hall of India, 1996.*
2. *James E. Palmer, David E. Perlman, "Introduction to Digital Systems", Tata McGraw Hill, 1996.*
3. *N.N. Biswas, "Logic Design Theory", Prentice Hall of India, 1993.*
4. *S. Devadas, A. Ghosh and K. Keutzer, "Logic Synthesis", Mc Graw Hill, 1994*

CP1 C 04 COMPUTER PROGRAMING LAB

(Expts. In Numerical Mathods & Programin C++ & Java)
(Cridets-4)

Computer Software & Numerical Methods:

Algorithm, Flow charting, Writing algorithm for: Factorial, generation of Fibonascii nos., Max & Minima, finding roots.

Solution of algebraic and transcendental equations:- Bisection method, Secant method, Newton -Raphson method - Solution of simultaneous algebraic equations:- Gauss elimination method, Gauss Jordan method, Gauss-Seidal method – Sorting:- quick, bubble and heap - Matrix inversion, addition and multiplication.

Compilers and Interpreters, Linking and Loading, Library, Procedural languages. Structured and modular programming. Introduction to Object Oriented Programming

C++:

Elements of C++ programs: Syntax and Semantics, Data and Data types, Declarations. Arithmetic expressions, Function call and Library functions, Formatting output, interactive input/output, File input and output.

Conditions and logical expressions, Looping, Functions, Simple Data types- built in and User defined. One dimensional arrays, lists and strings, multidimensional arrays, Records, Abstract Data Types. C++ classes, OOP in C++, Recursion

Java:

Programming structures in Java: Data types, variables, assignments and initialization, operators, strings, control flow, class methods, arrays

Objects and Classes: Using classes, packages, inheritance, interfaces and inner classes

Graphics programming, Event handling

User interface components with Swing: Text input, making choices, scroll bars, layout management, menus, dialog boxes

Applets, stream and Files

Reference Books:

1. *Nell Dale, Chip Weems and Mark Headington , "Programming in C++" Narosha Publishing House, 1998*
2. *Cay S. Horshmann &Gary Cornell, " Core Java 1.2 Vol-I " Sun Microsystem Java Series*
3. *E. Balaguruswamy "Programming with JAVA - A Primer" 2/e, Tata McGraw Hill. 2000*

SEMESTER - II

HP2 C 01 HIGH PERFORMANCE COMMUNICATION NETWORKS

(Cridets-4)

Basics of Networks

Telephone, computer, cable television and wireless networks, networking principles, and digitization: service integration, network services and layered architecture, traffic characterization and QOS, network services: network elements and network mechanisms.

Packet Switched Networks

OSI and IP models: Ethernet (IEEE 802.3); token ring (IEEE 802.5), FDDI, DQDB, frame relay: SMDS: Internetworking with SMDS.

Internet and TCP/IP Networks

Overview; Internet protocols; TCP and UDP, performance of TCP / IP networks, circuit - switched networks: SONET; DWDM, Fiber to home, DSL. Intelligent networks, CATV.

ATM and Wireless networks

Main features - addressing, signaling and routing; ATM header structure - adaptation layer, management and control; BISDN; Internetworking with ATM, Wireless channel, link level design, channel access; Network design and wireless networks.

Optical Networks and Switching

Optical links - WDM systems, cross-connects, optical LANs, optical paths and networks; TDS and SDS: modular switch designs – packet switching, distributed, shared, input and output buffers.

Text & Reference Books

1. *Jean Warland and Pravin Varaiya, " High Performance Communication Networks ", 2nd edition, Harcourt and Morgan Kauffman, London, 2000.*
2. *Leon Garcia, Widjaja, " Communication Networks ", Tata McGraw-Hill, New Delhi, 2000*
3. *Sumit Kasera, Pankaj Sethi, " ATM Networks ", Tata McGraw-Hill, New Delhi, 2000.*
4. *Behrouz A. Forouzan, " Data Communication and Networking ", Tata McGraw-Hill, New Delhi, 2000.*

CM2 C 02 CELLULAR MOBILE COMMUNICATION

(Cridets-4)

Introduction to Wireless Mobile Communications

History and evolution of mobile radio systems. Types of mobile wireless services/systems - Cellular, WLL, Paging, Satellite systems, Standards, Future trends in personal wireless systems

Cellular Concept and System Design Fundamentals

Cellular concept and frequency reuse, Multiple Access Schemes, channel assignment and handoff, Interference and system capacity, Trunking and Erlang capacity calculations

Mobile Radio Propagation

Radio wave propagation issues in personal wireless systems, Propagation models, Multipath fading and Base band impulse respond models, parameters of mobile multipath channels, Antenna systems in mobile radio

Modulation and Signal Processing

Analog and digital modulation techniques, Performance of various modulation techniques-Spectral efficiency, Error-rate, Power Amplification, Equalizing Rake receiver concepts, Diversity and space-time processing, Speech coding and channel coding

System Examples and Design Issues

Multiple Access Techniques-FDMA, TDMA and CDMA systems, operational systems, Wireless networking, design issues in personal wireless systems

Text &Reference Books:

1. *K.Feher, Wireless digital communications, PHI, New Delhi, 1995*
1. *T.S.Rappaport, Wireless digital communications; Principles and practice, Prentice Hall, NJ, 1996.*
3. *W.C.Y.Lee, Mobile communications Engineering: Theory And Applications, Second Edition, McGraw Hill, New York, 1998.*
4. *Schiller, Mobile Communications; Pearson Education Asia Ltd., 2000*

MC2 C 03 MULTIMEDIA COMPRESSION TECHNIQUES

(Cridets-4)

Introduction

Brief history of data compression applications, Overview of information theory, redundancy. Overview of Human audio, Visual systems, Taxonomy of compression techniques. Overview of source coding, source models, scalar quantisation theory, rate distribution theory, vector quantisation, structure quanitizers. Evaluation techniques-error analysis and methodologies

Text Compression

Compact techniques-Huffmann coding - arithmetic coding-Shannon-Fano coding and dictionary techniques- LZW family algorithms. Entropy measures of performance-Quality measures.

Audio Compression

Audio compression techniques-frequency domain and filtering-basic subband coding-application to speech coding-G.722-application to audio coding-MPEG audio, progressive encoding for audio - silence compression, speech compression techniques-Vocoders

Image Compression

Predictive techniques-PCM, DPCM, DM. Contour based compression-quadtrees, EPIC, SPIHT, Transform coding-JPEG, Wavelet based still image compression-JPEG 2000, JBIG.

Video Compression

Video signal representation, Video compression techniques-MPEG, Motion estimation techniques-H.261.Overview of Wavelet based compression and DVI technology, Motion video compression, PLV performance, DVI real time compression

Text & Reference Books:

1. Mark Nelson, Data compression book, BPB Publishers, New Delhi, 1998

2. Sayood Khaleed, Introduction to data compression, Morgan Kauffman, London, 1995

3. Watkinson.J, Compression in video and audio, Focal press, London 1995

4. Jan Vozer, Video compression for multimedia, AP profes, NewYork, 1995.

AI2 C 04 ARTIFICIAL INTELLIGENCE

(Cridets-4)

INTRODUCTION

Symbol systems, Semantics, Modeling, Dimensions of Representation, Programs, Patterns, Simplicity and Expressiveness

SEARCH AND PROBLEM SOLVING

Concepts of search, Blind Search, Directed & Hierarchical search

KNOWLEDGE & SOFTWARE ENGINEERING

Understanding knowledge systems in context, Formulating expertise, Collaboratively articulating work practice, Knowledge versus complexity

REASONING ABOUT SPACE

Spatial concepts, Spatial search, Reasoning about shape, Reasoning about uncertainty and vagueness, Representing uncertainty, Representing vagueness

CLASSIFICATION

Models for classification Domains; Configuration: Models for Configuration Domains; Diagnosis and Troubleshooting: Model for diagnosis domains; Knowledge and methods for diagnosis

Text &Reference Books:

Stefik Mark: Introduction to knowledge systems- Morgan Kaufmann Publishers Inc 1995 (C h 1,2,3,5,6,7,8,9)

MP2P02 - MICROCONTRLLER AND MICROPROCESSOR LAB

8051 PROGRAMS

1.8 BIT ADDITION WITH CARRY
2.16 BIT ADDITION WITH CARRY
3.8 BIT SUBTRACTION
4.8 BIT MULTIPLICATION AND DIVISION
5.SPLITTING AND ASSEMBLING OF TWO 8 BIT NUMBERS
6.ARRAY COMPLEMENT
7.ARRAY ADDITION
8.SMALLEST AND LARGEST NUMBERS IN AN ARRAY
9.DECIMEL TO ASCII CONVERSION
10.ASCII TO DECIMEL
11.DECIMEL TO HEX
12.HEX TO DECIMEL

INTERFACING WITH 8051

13. BINARY COUNTER
14.JOHNSON COUNTER
15.RING COUNTER
16.TRAFFIC LIGHT CONTROLLER
17.STEPPER MOTOR
18.ADC AND DAC

8086 PROGRAMS

1. PRINT A TO Z USING DEBUG
2.PRINT BINARY NUMBERS FROM 0 TO 16
3.PRINT A STRING
4. CONVERT LOWER CASE TO UPPERCASE
5.PRINT CONTENT OF A REGISTER
6.PRINT CONTENT OF A REGISTER IN DECIMEL
7.PRINT SUM OF TWO 16 BIT NUMBERS
8.MULTIPLY TWO 8 BIT NUMBER
9.CHECK FOR A CHARECTER IN A STRING
10. PRINT A TO Z VERTICALLY

SEMESTER - III

ES3 C 01 EMBEDDED SYSTEMS

(Cridets-4)

Overview of embedded systems

Design challenge, Processor technology, IC technology, Design Technology

Custom-Single purpose processors

Custom single purpose processor design, optimizing custom single processors, Basic architecture, operation, programmers view, development environment, Application specific instruction set processors, selecting a microprocessor

Standard single-purpose processors

Peripheral Timers, counters, watchdog timers, UART ,Pulse width modulator, LCD controller, Keypad controller, ADC, Real time clocks

Memory

Memory write ability and storage performance, Common memory types, composing memories, memory hierarchy and cache, advanced RAM: DRAM, FPM DRAM, EDO DRAM, SDRAM, and RDRAM, Memory management Unit

Interfacing

Arbitration, Muti-level bus architectures, Serial protocols: I2C bus, CAN bus, Fire Wire bus, USAB, Parallel protocols: PCI and ARM bus, Wireless Protocols: IrdA, Bluetooth, IEEE802.11

Digital Camera

Case study of embedded system, Brief study - State Machine and Concurrent Process Models

Control systems

Open loop and closed loop systems, General control systems and PID controllers, Fuzzy control, Practical issues related to computer based control, Benefits of computer based control implementations

Text & Reference Book:

Embedded System Design: A Unified Hardware /Software Introduction, Frank Vahid and Tony Givargis, Wiley 2001

DP3 C 02 ADVANCED DIGITAL SIGNAL PROCESSING

(Cridets-4)

Discrete Random Signal Processing

Discrete Random Processes, Expectations, Variance, Co -Variance, Scalar Product, Energy of Discrete Signals- Parseval's Theorem, Wiener Khintchine Relation- Power Spectral Density- Periodogram –Sample Autocorrelation- Sum Decomposition Theorem, Spectral Factorization Theorem - Discrete Random Signal Processing by Linear Systems - Simulation of White Noise - Low Pass Filtering of White Noise.

Spectrum Estimation

Non-Parametric Methods-Correlation Method - Co-Variance Estimator- Performance Analysis of Estimators -Unbiased, Consistent Estimators-Periodogram Estimator-Barlett Spectrum Estimation-Welch Estimation- Model based Approach - AR, MA, ARMA Signal Modeling- Parameter Estimation using Yule-Walker Method

Linear Estimation and Prediction

Maximum likelihood criterion-efficiency of estimator-Least mean squared error criterion -Wiener filter- Discrete Wiener Hoff equations-Recursive estimators-Kalman filter-Linear prediction, prediction errorwhitening filter, inverse filter-Levinson recursion, Lattice realization, and Levinson recursion algorithm for solving Toeplitz system of equations.

Adaptive Filters

FIR adaptive filters-Newton's steepest descent method -adaptive filter based on steepest descent method- Widrow Hoff LMS adaptive algorithm- Adaptive channel equalization-Adaptive echo chancellor-Adaptive noise cancellation-RLS adaptive filters-Exponentially weighted RLS-sliding window RLS-Simplified IIR LMS adaptive filter

Multirate Digital Signal Processing

Mathematical description of change of sampling rate - Interpolation and Decimation - continuous time model - Direct digital domain approach - Decimation by an integer factor - Interpolation by an integer factor – Single and multistage realization - poly phase realization - Application to sub band coding - Wavelet transform and filter bank implementation of wavelet expansion of signals.

Text & Reference Books:

1. *Monson H. Hayes, Statistical Digital Signal Processing and Modeling, John Wiley and Sons, Inc., New York, 1996.*

References:

1. Sopocles J.Orfanidis, Optimum Signal Processing, McGraw Hill, 1990.

2. John G.Proakis, Dimitris G.Manolakis, Digital Signal Processing Prentice Hall of India, 1995

VL3 C 03 VLSI DESIGN, TOOLS & TECHNOLOGY

(Credits 4)

MOS Technology and Circuits

MOS Technology and VLSI, Process parameters and considerations for BJT, MOS and CMOS, Electrical properties of MOS circuits and Device modeling.

MOS Circuit Design Process

MOS Layers, Stick diagram, Layout diagram, Propagation delays, Examples of combinational logic design, Sealing of MOS circuits.

Digital Circuits and Systems

Programmable Logic array (PLA) and Finite State Machines, Design of ALUs, Memories and Registers.

Analog VLSI and High speed VLSI

Introduction to Anlog VLSI, Realisation of Neutral Networks and Switched capacitor filters, Sub-micron technology and GaAs VLSI technology

Hardware Description Languages

VHDL background and basic concepts, structural specifications of hardware design organization and parameterization.

Texts and Reference Books:

1. Douglas A. Pucknell and Kamran Eshraghian, Basic VLSI Design Systems and Circuits, Prentice Hall of India Pvt Ltd., 1993.

2. *Wayne Wolf, Modern VLSI Design, 2nd Edition, Prentice Hall, 1998.*
3. *Amar Mukherjee, Introduction to NMOS and CMOS VLSI System Design, Prentice Hall, 1986.*
4. *Randall L Geiger and PE Allen, VLSI Design Techniques for Analog and Digital Circuits, McGraw Hill International Company, 1990.*
5. *Fabricious.E, Introduction to VLSI Design, Mcgraw Hill 1990.*
6. *Navabi.Z, VHDL Analysis and Modeling of Digital Systems, McGraw Hill 1993.*
7. *Mohammed Ismail and Terri Fiez, Analog VLSI Signal and Information Processing, McGraw Hill, 1994.*
8. *Peter J Ashenden, The Designer's Guide to VHDL, Harcourt Asia Private Limited & Morgan Kauffman, 1996.*

ELECTIVES
CA3 E 01 COMPUTER ARCHITECTURE & PARLLEL PROCESSING
(Cridets-4)

THEORY OF PARALLELISM

Parallel computer models - the state of computing, Multiprocessors and Multicomputers and Multivectors and SIMD computers, PRAM and VLSI models, Architectural development tracks. Program and network properties, Conditions of parallelism, Program partitioning and scheduling, Program flow mechanisms, System interconnect architectures. Principles of scalable performance - performance matrices and measures, Parallel processing applications, speedup performance laws, scalability analysis and approaches

HARDWARE TECHNOLOGIES

Processor and memory hierarchy advanced processor technology, superscalar and vector processors, memory hierarchy technology, virtual memory technology, bus cache and shared memory - backplane bus systems, cache memory organizations, shared memory organizations, sequential and weak consistency models.

PIPELINING AND SUPERSCALAR TECHNOLOGIES

Parallel and scalable architectures, Multiprocessor and Multicomputers, Multivector and SIMD computers, Scalable, Multithreaded and data flow architectures

SOFTWARE AND PARALLEL PROGRAMMING

Parallel models, Languages and compilers, Parallel program development and environments, UNIX, MACH and OSF/1 for parallel computers.

Text & Reference Books:

1. *Kai Hwang, "Advanced Computer Architecture", McGraw Hill International, 1993.*
2. *William Stallings, "Computer Organization and Architecture", Macmillan Publishing Company, 1990.*
3. *M. J. Quinn, "Designing Efficient Algorithms for Parallel Computers", McGraw Hill International, 1994*

MI3 E 02 MICROWAVE INTEGRATED CIRCUITS
(Cridets-4)

Microstrips Lines, Design & Analysis

Introduction, types of MICs and their technology, Propagating models, Analysis of MIC by conformal transformation, Numerical analysis, Hybrid mode analysis. Losses in Microstrip, Introduction to slot line and coplanar wave guide

Coupled Microstrips, Directional Couplers and Lumped Elements for MICs (12)

Introduction to coupled Microstrips, Even and odd mode analysis, Directional couplers, branch linecouplers, Design and Fabrication of Lumped elements for MICs, Comparison with distributed circuits

Non-reciprocal Components and Active Devices for MICs

Ferromagnetic substrates and inserts, Microstrip circulators, Phase shifters, Microwave transistors, Parametric diodes and Amplifiers, PIN diodes, Transferred electron devices, IMPATT, BARITT, Avalanche diodes, Microwave transistors circuits

Microstrip Circuit Design and Applications

Introduction, Impedance transformers, Filters, High power circuits, Low power circuits, MICs in satellite and Radar

MMIC Technology

Fabrication process of MMIC, Hybrid MICs, Configuration, Dielectric substances, thick and thinfilm technology, Testing methods, Encapsulation and mounting of Devices.

Text & Reference Books

1. Hoffman R.K."HandBook of Microwave integrated circuits", Artech House, Boston, 1987.
2. Gupta .K.C and Amarjit Singh,"Microwave Integrated circuits"John Wiley, New York, 1975

II3 E 03 INDUSTRIAL INSTRUMENTATION & AUTOMATION

(Cridets-4)

Module 1

IBM PC & Interfacing :PC architecture, mother board, memory, bus expansion system (ISA,EISA,PCI etc), external interface standards (like Rs.232, Rs 485, centronics, IEEE 488 etc.), operating systems, device drivers and system programming, plug & play cards. (To be covered, only to the extent to use PC as an application tool)

Module 2

Selected industrial Measurements: Transducers/sensors for general industrial measurement of temperature, force & weight, torque, pressure, flow, level, displacement, thickness and velocity. Signal conditioning (linearisation of measured variables, amplification etc.), various type of transmitters, Interfacing, calibration etc.

Module 3

PC based data acquisition modules: analog I/) module, digital I/O modules, counter/frequency modules, data conversion techniques, etc. Controllers: implementation of on/off feedback & feed forward controllers, cascading & tuning of control loop etc.. Actuatiors /final control elements. Software: tools for virtual instrumentation, soft logic, OLE,SCADA,DCS,HMI etc.. PC based data acquisition & control system design

Module 4

Intelligent Instrumentation: Design and implementation of fuzzy logic & neural networks based controllers, smart sensors and transmitters, field programmers

Module 5

Programmable logic controllers: PLC system architecture, hard ware (CPU module, analog I/O modules, digital I/O modules, counter/frequency modules etc., programming languages (IEC-1131-3 based). Programmable logic controllers based system design

Text &References

1. *Inside The PC; by: Peter Norton;PHI*
2. *Standards & Recommended Practices for Instrumentation & Control, Vol 1-3; Instrument Society of America*
3. *Soft Logic;by Robert Carrow; McGraw Hill*
4. *Essentials of user interface design;by Allan Cooper; Comdex*
5. *Writing Windows Virtual Device Drivers by; David Thielen; Byran. Addison Wesely*
6. *Programmable Logic Controllers;by Thomas Hughes;Instrument Society of America*
7. *Instrument Engineers Hand Book, process Measurement;byBela G.Liptak;Instrument Society of Americaa*
8. *Instrument Engineeris Hand Book;Process Control;by:Bela G.Liptak; Instrument Society of America*
9. *Measurement Systems; Application and Design;by Erbest O.Deobelin, McGraw-Hill*

User's/Programmer's manuals of PC, OS, DAS cards, etc. to be referred

SE3 E 04 SATELLITE COMMUNICATION
(Cridets-4)

Orbital Parameters
Orbital parameters, Orbital perturbations, Geo-stationary orbits. Low Earth and medium Earth orbits. Frequency selection, Frequency co-ordination and regulatory services, Sun transit outages, Limits of visibility, Attitude and Orientation control, Spin stabilization techniques, Gimbal platform.

Link Calculations
Spacecraft Configuration, Payload and supporting subsystems, Satellite up link-down link, Link power budget, C/No, G/T, Noise temperature, System noise, Propagation factors, Rain and Ice effects, Polarization calculations.

Access Techniques
Modulation and Multiplexing: Voice, Data, Video, Analog and Digital transmission systems, Multiple access techniques: FDMA, TDMA, T1- T2 carrier systems, SPADE, SS-TDMA, CDMA, Assignment Methods, Spread spectrum communication, Compression - Encryption and Decryption techniques.

Earth Station Parameters
Earth station location, Propagation effects of ground, High power transmitters - Klystron, Crossed field devices. Receivers: Low noise front end amplifiers, MIC devices, Antennas: Reflector antennas, Cassegranian feeds, Measurements on G/T and E_b/N_o.

Satellite Applications
(10)
INTELSAT series, INSAT, VSAT, Remote sensing, Mobile Satellite service: GSM.GPS, INMARSAT, Satellite Navigation System, Direct to home service (DTH), Special services - E-mail, Video conferencing and Internet connectivity.

Text & Reference books:

1. *Bruce R. Elbert, " The Satellite Communication Applications Hand Book ", Artech House Boston, 1997.*
2. *Wilbur L. Pritchard, Hendri Suyderhood G., Robert A. Nelson, " Satellite Communication Systems Engineering", II edition, Prentice Hall, New Jersey, 1993.*
3. *Dennis Rody, " Satellite Communication ", Regents/Prentice Hall, Englewood cliffs, New Jersey, 1989.*
4. *Tri T. Ha, " Digital Satellite Communication ", 2nd edition, McGraw Hill, New York, 1990.*
5. *Feher K., " Digital Communication Satellite / Earth Station Engineering ", Prentice Hall Inc, NewJersey, 1983.*

CD3P03 - COMMUNICATION AND DSP LAB

DSP LAB

1.FEMILARISATION OF MATLAB
2.MATRIX ADDITION
3.MATRIX Subtraction
4.INVERSE OF THE MATRIX
5.LINEAR CONVOLUTION
6.CIRCULAR CONVOLUTION
7.DISCRETE TME SIGNALS AND SYSTEMS
8.DTFT
9.DFT
10.IMPULSE RESPONSE
11.FFT OPERATION
12.IFFT OPERATION
13.VERIFICATION OF SAMPLING THEOREM
14.DESIGN OF FIR FILTERS
15.DESIGN OF IIR FILTERS
16.Z TRANSFORMS
17.FEMILARISATION OF DSP TRAINER KIT FROM TEXAS INSTRUMENT TMS 320 SERIES

COMMUNICATION LAB

1.INTRODUCTION TO SIMULINK
2.AM- MODULATION AND DEMODULATION
3.FM - MODULATION AND DEMODULATION
4.DIGITAL MODULATION
.PAM
. BFSK
. MSK
5.FEMILIARIZATION OF OPTICAL FIBER TRAINER KIT & FUNDAMENTALS OF FIBER OPTIC COMMU

IV Semester

NN4 C 01 NEURAL NETWORKS & APPLICATIONS

(Cridets-4)

Introduction to Artificial Neural Networks

Neuro-physiology - General Processing Element - ADALINE - LMS learning rule - MADALINE - MR2 training algorithm

BPM and BAM

Back Propagation Network - updating of output and hidden layer weights -application of BPN - associative
memory - Bi-directional Associative Memory - Hopfield memory - traveling sales man problem

Simulated Annealing and CPN

Annealing, Boltzmann machine - learning - application - Counter Propagation network - architecture - training - Applications

SOM and ART

Self organizing map - learning algorithm - feature map classifier - applications - architecture of Adaptive Resonance Theory - pattern matching in ART network

Neocognitron

(10)

Architecture of Neocognitron - Data processing and performance of architecture of spacio - temporal networks for speech recognition.

Text & Reference Books:

1. *J.A. Freeman and B.M. Skapura , "Neural Networks, Algorithms Applications and Programming Techniques", Addison-Wesely, 1990.*
2. *Laurene Fausett, "Fundamentals of Neural Networks: Architecture, Algorithms and Applications", Prentice Hall, 1994*

ELECTIVES

RO4 E 01 ROBOTICS

(Cridets-4)

Robot Organization

Coordinate transformation, kinematics and inverse kinematics. Trajectory planning and remote manipulation.

Robot Hardware

Robot sensors, Proximity sensors, Range sensors, Visual sensors, Auditory sensors. Robot manipulators, Manipulator dynamics, Manipulator control, Wrists, End efforts, Robot grippers.

Robot and Artificial Intelligence

Principles of AI. Basics of learning. Planning movement. Basics of knowledge representations, Robot programming languages

Robotic Vision Systems

Principles of edge detection, Determining optical flow and shape, Image segmentation, Pattern recognition, Model directed scene analysis.

Robot Control and Application

Robot control using voice and infrared, Overview of robot applications, Prosthetic devices. Robots in material handling, processing assembly and storage.

Text &Reference Books:

1. *Koren, "Robotics for Engineers", McGraw Hill International Company, Tokyo, 1995.*
2. *Vokopravotic, "Introduction to Robotics", Springer, 1988.*
3. *Rathmill K., "Robot Technology and Application", Springer, 1985.*
4. *Charniak and McDarmott, "Introduction to Artificial Intelligence", McGraw Hill, 1986.*
5. *K.S. Fu, R.C. Gonzally, C.S.G. Lee, "Robotics Control, Sensing, Vision and Intelligence", McGraw Hill Book Company, 1997.*
6. *Barry Leatham, Jones, "Elements of Industrial Robotics", Pittman Publishing, 1987.*
7. *Mikell P. Groover, Mitchell Weiss, Roger. N, Nagel, Nicholas G. Odrey, "Industrial Robotic Technology Programming and Applications", McGraw Hill Book Company, 1986.*
8. *Bernard Hodges and Paul Hallam, " Industrial Robotics ", British Library Cataloguing Publication, 1990.*

DR4 E 02 DIGITAL COMMUNICATION RECEIVERS
(Cridets-4)

Review of Digital Communication Techniques
Base band and band pass communication, signal space representation, linear and nonlinear modulation techniques, and spectral characteristics of digital modulation

Optimum Receivers for AWGM Channel
Correlation demodulator, matched filter, maximum likelihood sequence detector, optimum receiver for CPM signals, M-ary orthogonal signals, envelope detectors for M-ary and correlated binary signals

Receivers for Fading Channels
Characterization of fading multiple channels, statistical models, slow fading, frequency selective fading, diversity technique, RAKE demodulator, coded waveform for fading channel

Synchronization Techniques
Carrier and signal synchronization, carrier phase estimation-PLL, Decision directed loops, symbol timing estimation, maximum likelihood and non-decision directed timing estimation, joint estimation.

Adaptive Equalization
Zerofacing algorithm, LMS algorithm, adaptive decision-feedback equalizer and Equalization of Trellis-coded signals. Kaiman algorithm, blind equalizers and stochastic gradient algorithm Echo cancellation

Text & Reference Books:

1. *Heinrich Meyer, Mare Moeneclacy, Stefan. A. Fechtel, "Digital communication receivers", Vol I & II , John Wiley, New York, 1997*

2. *John. G. Proakis, "Digital communication"4th Edition, McGraw Hill, New York, 2001*

3. *E. A. Lee and D. G. Messerschmitt, "Digital communication", 2nd Edition, Allied Publishers, New Delhi.1994*

4. *Simon Marvin, "Digital communication over fading channel; an unified approach to Performance Analysis", John Wiley, New York, 2000.*

TE4 E 03 TELEMATICS
(Cridets-4)

Basics of Telephony

Telephone network overview, subscriber loop, signaling in the telephone network, overview of ISDN, BISDN and ATM Technologies

Circuit Switching in Telephone Networks

Crossbar switch; Clos networks; Clos and Slepian Duguid theorems, recursive construction of Clos network; time switching, TMS and TST switches, Lee and Jacobeus blocking analysis, routing in R-NB network, call processing and overload control; example of Telephone switches

Multiplexing & Routing in Circuit Switched Networks

Abstract system models, Equivalent random theory, Haywards approximation and introductory non-Poisson arrival process; product form solution, Techniques to choose good routes, Alternate routing, Dynamic routing, Least busy alternate routing.

Text & Reference Books:

1. Switching and Traffic Theory for Integrated Broadband Networks, J.Y.Hui

2. Mathematical Theory of connecting Networks and Telephone Traffic, V.E.Benes

QC4 E 04 QUANTUM COMPUTING
(Cridets-4)

Introduction

Weirdness of quantum world, interference, projection, spin.

Mathematical Apparatus of Quantum Computing

Linear algebra, Hilbert spaces, inner/outer/tensor products, entanglement, measurement

Postulates of Quantum Mechanics

Reversible computation, quantum gates and circuits. Complete sets of gates, quantum algorithms (Deutsch early promise, Deutsch-Josza) Quantum algorithms II (Shor's and Grover's algorithms)

Quantum cryptography, noise, error correction and physical implementations of Quantum Computers

DNA Computing

DNA Computing, Hamiltonian path problem, Adelman's technique

DNA computing (current status)

Chemical/Physical Computing

Reaction-diffusion systems, non-linear excitable media

Field computing on graphs, Excitable lattices

Text & Reference Books:

1. Gruska J. (1999) Quantum Computing. McGraw-Hill.
2. Nielsen M., Chuang I. (2000) Quantum Computation and Quantum Information. CUP.
3. Lo H-K., Spiller T. (1998) Introduction to Quantum Computation and Information. World Scientific.
4. Hirvensalo M. (2000) Quantum Computing. Springer.
5. Pittenger A. (1999) An Introduction to Quantum Computing Algorithms. Birkhauser.
6. Styer D. F. (2000) The Strange World of Quantum Mechanics. CUP.
7. Isham C. J. (1995) Lectures on Quantum Theory: Mathematical and Structural Foundations. World Scientific.
8. Brassard, G., Bratley, P. (1996) Fundamentals of Algorithmics. Addison Wesley.

AM1CO1 Applied Mathematics
Ist Semester M.Sc Electronics (CSS)- Model Question Paper

Section A

Short Answer Questions

(Answer all Questions)

Time :3 Hrs **Weightage :36**

(1*14 = 14)

1.) A poisson variable is such that P{x=1}= 2 P{x=2}find P{x=0}.

2.) If f(x,y) = 6 x^2 y, 0 < x < 1, 0 < y < 1, find P(0 < x < ¾)

3.) Obtain the moment generating function of the Binomial distribution.

4.) Given that the two regression equations are 8x 10y + 66 = 0, 40x 18y 214 = 0. Identify the regression lines of y on x and x on y.

5.) Find a real root of the equation x^3 - 2x 5 =0 using secant method.

6.) State the condition for convergence of Gauss Seidel iteration method.

7.) Solve **2x + y + z = 10**
3x + 2y + 3z = 18
x + 4y + 9z = 16 **by Gauss Elimination method.**

8.) Show that $J_{-n}(x) = (-1)^n J_n(x)$, Where 'n' is an integer.

9.) Show that $P_n(1) = 1$ and $P_n(-1) = (-1)^n$

10.) Prove that $J_{1/2}(x) = \sqrt{2/(\pi x)}\ \sin x$

11.) Express $f(x) = x^4 + 3x^3 x^2 + 5x - 2$ in terms of Legendre polynomial.

12.) Explain "Customer impatience" in queuing theory.

13.) State the D'Alembert's solution to a one-dimentional wave equation.

14.) Write down the one dimentional wave equation.

(1 X 14= weightage 14)

Section B

Short Essay Questions

(Answer any seven questions, weightage 7x2 =14)

15.) Find the coefficient of correlation and obtain the lines of regression from the data given Below

x	62	64	65	69	70	71	72	74
y	126	125	139	145	165	152	180	208

16.) A continuous random variable has distribution function

$$F(X) = \begin{cases} 0, & \text{if } x \le 1 \\ k(x-1)^4, & \text{if } 1 \le x \le 3 \\ 1, & \text{if } x > 3 \end{cases}$$

Find (i) k (ii) Probability density function.

17.) Solve the simultaneous equations

27x + 6y - z = 85

$x + y + 54z = 110$

$6x + 15y + 2z = 72$, using Gauss seidel iterative method.

18.) (a) Use Newton Raphson's method to find an approximate root (upto two decimal places) of the equation $x e^x \cos x = 0$.

(b) Using Bisection method Find a root of the equation $x^3 \times 11 = 0$ which lies between 2 and 3

19.) Obtain the D'Alembert's solution to a one-dimentional wave equation.

20.) Obtain the series solution to the Bessel's differential equation.

21.) Show that the Legendre polynomial satisfies the orthogonal property.

22.) If μ_r' denotes the r^{th} raw moment of the poisson distribution with parameter λ, show that

$\mu_{r+1}' = \lambda [\mu_r' + d \mu_r' / d \lambda]$

23.) A T.V repairman finds that the time spent on his jobs has an exponential distribution with mean 30 minutes. If he repairs sets in the order in which they came in and if the arrival of sets is approximately poisson with an average rate of 10 per 8 hour day. What is the repairman's expected idle time each day ? How many jobs are ahead of the average set just brought in ?

24.) State the assumption involved in a M/M/1 queuing model. Give a practical example.

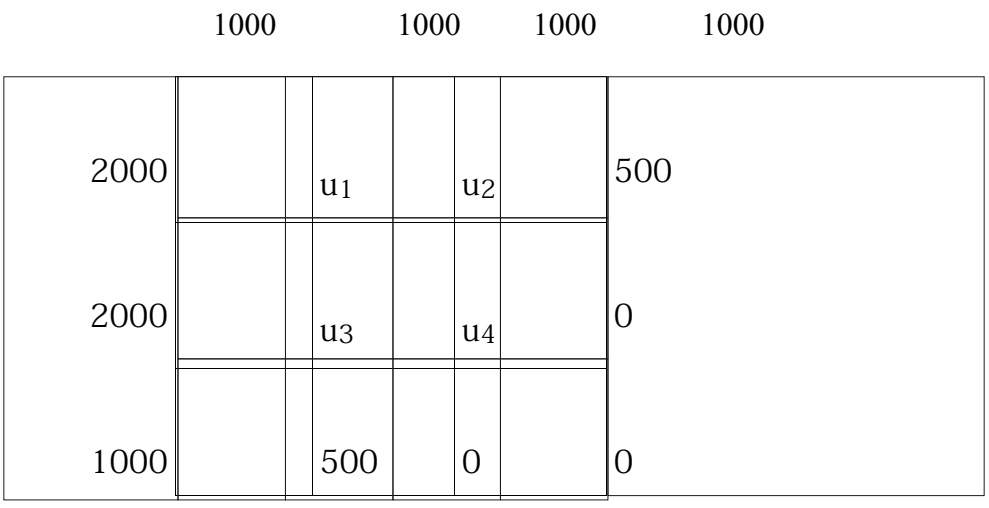
(2X 7= weightage 14)

Section C

Essay Questions

(Answer any two questions, Weightage 2x4 =8)

25.) Evaluate the Laplace equation $\nabla^2 u = 0$ at the pivotal points of the following figure



26.) Using the method of laplace transform solve for the initial boundary value problem:

$U_{xx} = (1/c^2)\, u_{tt} \cos \omega t$, $0 \leq x <$

U(0,t) = 0 and u is bounded as x tends to .

$U_t(x,0) = U(x,0) = 0$

27.) Prove that: (i) $J_O''(x) = -J_O(x) - (1/x) J_O'(x)$

(ii) $J_O'''(x) = (1/x) J_O(x) + ((2/x^2) - 1) J_O'(x)$

28.) (a) Explain the terms (i) input process (iii) service mechanism (iii) Queue discipline in queuing theory

(b) The joint distribution of two random variables x and y is given as

$f(x,y) = C(2 - x - y)$, $0 \leq x \leq 1$, $0 \leq y \leq 1$

Find (i) value of C

(ii) Marginal distribution of x and y

(iii) Mean of x and y.

_____ **(2 X 4= weightage 8)**

MM1CO2 Microcontroller and Microprocessors Applications

Ist Semester M.Sc Electronics (CCSS) Model Question Paper

Section A

Short Answer Questions

(Answer all Questions, Weightage 1 x 14 = 14)

Time :3Hrs **Weightage : 36**

1. What is an interrupt? List the interrupts in 8085.
2. Briefly explain N-key rollover?
3. Write modes of 8255?
4. List features of 8254 compared with 8253?
5. Explain the difference between sensors and transducers.
6. Write short notes on ADC?
7. Write short notes on BIU?
8. Briefly explain 8051 microcontrollers?
9. Explain the role of ALE?
10. List the different modes in 8253?
11. What is meant by HOLD and HLDA?
12. Write short notes on RS_232?
13. Explain ultrasonic distance measuring?
14. What is meant by addressing modes?

(2 X 7= weightage 14)

Section B

Short Essay Questions

(Answer any seven questions, weightage 7x2 =14)

1. Explain interrupts in 8086?
2. Explain keyboard\display interface chip?
3. Explain about transducers?
4. Write notes on real time operating system?
5. Explain PWM motor control?
6. Explain addressing modes in 8051?
7. Explain registers in 8051?
8. Describe DMA operation?
9. Explain about USB?
10. Write an ALP to find the sum of two 8-bit numbers?

(2 X 7= weightage 14)

Section C

Essay Questions

(Answer any two questions, Weightage 2x4 =8)

1. a) Explain the steps involved in interfacing of ADC and 8086 mp with neat diagram?

   b) Explain interrupt service routine?
2. Explain the architecture of 8051 microcontroller with neat diagram?
3. Explain the programmable interval timer chip with neat diagram?
4. Write an ALP to find out the second largest of n numbers using 8051 microcontroller.

(2 X 4= weightage 8)

I SEMESTER M.Sc. ELECTRONICS (CUCSS)

DC1CO3-MODERN DIGITAL AND OPTICAL COMMUNICATION SYSTEM

Model Question Paper

Section - A

Time: 3 hours **Total weight: 36**

Short answer type questions (answer all questions)

1. What is the difference between static and dynamic broadcast networks?
2. Briefly explain what is a store-and-forward subnet.
3. What are the two reasons for using layered protocols?
4. What are the advantages and disadvantages of Bluetooth?
5. A noiseless 4 kHz channel is sampled every 1 msec. What is the maximum data rate?
6. Explain byte stuffing.
7. Calculate the maximum number of users that D-AMPS can support simultaneously within a single cell.
8. What is piggy backing?
9. Briefly explain about reservation protocols
10. Write the difference between DCF and PCF
11. What is the difference between leaky bucket algorithm and token bucket algorithm
12. Describe a way to reassemble IP fragments at the destination
13. Define bit-error rate
14. Define optical signal to noise ratio (OSNR)

(1 X 14= weightage 14)

Section B: Paragraph type (answer any seven questions)

15. Explain the relationship between a service and a protocol
16. Give a brief comparison of OSI and TCP/IP reference models
17. Write an example of simplex stop-and-wait protocol.
18. Explain the difference between circuit switching and packet switching
19. Explain the difference between 10base 5, 10base 2 and 10 base T Ethernet cabling schemes
20. Describe the difference between store-and-forward and cut through switches
21. Compare datagram subnet and virtual circuit subnet
22. Write a short note on User Datagram Protocol (UDP)
23. What is the difference between chromatic depression penalty and polarization mode dispersion penalty
24. Draw the block diagram representations of two different band optical amplifiers in series and parallel

(2 X 7= weightage 14)

Section C: Essay type (answer any two questions)

25. Briefly explain each layers of OSI model
26. Compare 802.11 protocol stack with 802.16 protocol stack
27. Explain the specific functions of data link layer
28. Explain the amplification mechanism, Architecture, and power conversion efficiency of EDFA

(2 X 4= weightage 8)

First Semester M.Sc Electronics Degree Examination

DSI C04 Advanced Digital System Design (CSS) - Model Question Paper

Time: 3 hours **Weightage: 36**

I . Write short answers to the following. Answer ***all*** Questions. ***Weightage: 1***

1. One short answer type question from Unit 1 of the syllabus
2. Second short answer type question from Unit 1 of the syllabus
3. Third short answer type question from Unit 1 of the syllabus
4. Similar question from Unit II of the syllabus
5. Similar question from Unit II of the syllabus
6. Similar question from Unit II of the syllabus
7. Similar question from Unit III of the syllabus
8. Similar question from Unit III of the syllabus
9. Similar question from Unit III of the syllabus
10. Similar question from Unit IV of the syllabus
11. Similar question from Unit IV of the syllabus
12. Similar question from Unit V of the syllabus
13. Similar question from Unit V of the syllabus
14. Similar question from Unit V of the syllabus

(1 X 14= weightage 14)

II. Write short paragraph answers to the following. Answe*r* ***any seven*** questions.

15. One paragraph type question from Unit I of the syllabus
16. Second paragraph type question from Unit I of the syllabus
17. Similar question from Unit II of the syllabus
18. Similar question from Unit II of the syllabus
19. Similar question from Unit III of the syllabus
20. Similar question from Unit III of the syllabus
21. Similar question from Unit IV of the syllabus
22. Similar question from Unit IV of the syllabus
23. Similar question from Unit V of the syllabus
24. Similar question from Unit V of the syllabus

(2 X 7= weightage 14)

III. Answe*r* ***any two*** questions.

25. One essay type question (with or without subdivisions a,b,c) from Unit I of the syllabus
26. Similar question from other units of the syallabus (No two questions from the same unit)
27. Similar question from other units of the syallabus (No two questions from the same unit)
28. Similar question from other units of the syallabus (No two questions from the same unit)

(2 X 4= weightage 8)