BHARATHIAR UNIVERSITY: COIMBATORE.

M.Sc. APPLIED ELECTRONICS

(AFFILIATED COLLEGES - Effective from the academic Year 2010-2011)

SCHEME OF EXAMINATIONS – CBCS PATTERN

Sem.	Study Components	Course title	Ins. hrs/ week	Examinations				Credit
				Dur. HRS	CIA	Marks	Total Marks	
I	Paper I	-Microwave and RADAR Navigation Systems	4	3	25	75	100	4
	Paper II	- Microcontroller and its Applications	4	3	25	75	100	4
	Paper III	- Micro Electro Mechanical Systems and Power Electronics	4	3	25	75	100	4
	Paper IV	- Linear ICs and Applications	4	3	25	75	100	4
	Practical I	- General Electronics Lab	5	-	-	-	-	-
	Practical II	- Embedded & VHDL Lab	5	-	-	-	-	-
	Elective Paper I :		4	3	25	75	100	4
II	Paper V	- Embedded Systems	4	3	25	75	100	4
	Paper VI	- VHDL Programming	4	3	25	75	100	4
	Paper VII	- DSP Architecture and Programming	4	3	25	75	100	4
	Paper VIII	-High Performance Communication Networks	4	3	25	75	100	4
	Practical I	- General Electronics Lab	5	4	40	60	100	4
	Practical II	- Embedded & VHDL Lab	5	4	40	60	100	4
	Elective Paper II		4	3	25	75	100	4
30 days industrial training in an ELECTRONICS Industry								
III	Paper IX	- Advanced Digital Image Processing	4	3	25	75	100	4
	Paper X	- PC Based System Design	4	3	25	75	100	4
	Paper XI	- Wireless Communication Engineering	4	3	25	75	100	4
	Paper XII	- Nano Electronics and Systems	4	3	25	75	100	4
	Practical III	- PC Hardware Lab	5	4	40	60	100	4
	Practical IV	- DSP and DIP Lab	5	4	40	60	100	4
	Elective Paper III:		4	3	25	75	100	4
	PROJECT WORK & VIVA VOCE		10	-	-	250	250*	10
IV	Elective Practical:		5	4	40	60	100	4
	Total						2250	90

* Project report - 200 marks; Viva-voce – 50 marks

List of Group Elective papers (Colleges can choose any one of the Group papers as electives)

	GROUP A	**GROUP B**	**GROUP C**
Paper I/ Sem I	Web Technologies	Electronic Test Instruments	Basic VLSI Design
Paper II/ Sem II	Relational Data Base Management Systems	Analytical Instrumentation	ASIC Design
Paper III/ Sem III	Linux & Shell Programming	Virtual Instrumentation	VLSI Design Using Verilog
Paper IV/ Sem IV	RDBMS and Linux LAB	Instrumentation Lab	VLSI System Design Lab

SEM – I **Core Paper – I**

MICROWAVE AND RADAR NAVIGATION SYSTEMS

UNIT I INTRODUCTION TO MICROWAVE

Introduction – Maxwell's equation – ampere's law – faraday's law – gauss law – wave equation – TE, TM wave equation – wave guides – rectangular wave guides – propagation of waves in rectangular wave guides – TM and tm modes – propagation of tm waves in rectangular wave guides – tm modes in rectangular wave guides.

UNIT II MICROWAVE AMPLIFIERS AND OSCILLATORS

Klystrons – two cavity klystrons – multicavity klystrons – reflex klystrons – power output and frequency characteristics – efficiency of reflex klystron – traveling wave tube (TWT) – applications of TWT – backward wave oscillator – magnetron – cavity magnetron – sustained oscillation in magnetron – characteristics and applications of magnetron.

UNIT III MICROWAVE ANTENNAS

Quantitative theory of short dipole antenna – characteristics of grounded quarter wave and ungrounded half wave antenna – radiation resistance and radiation pattern – folded dipole and its application – broad side and fire array – loop antenna – direction finding by Adcock and beeline tossi system – helical – rhombic – YAGI antenna – horn antenna and parabolic reflectors.

UNIT IV PRINCIPLE OF RADAR

Introduction – block diagram of radar – application of radar – range equation – minimum detectable signal – receiver noise – s/n ratio – transmitter power – maximum ambiguous range – system losses.

Receiver: duplexer – local oscillator – mixer – line pulse modulator – displays – PPI

UNIT V FM RADAR AND MTI

Doppler effect – CW radar – fm CW radar – multiple frequency CW radar – Moving Target Indicator (MTI) – non coherent MTI – pulsed Doppler radar fm altimeter – tracking – sequential lobbing – conical scan – mono pulse tracking radar.

REFERENCE BOOKS

1. N. KULKARNI "**MICROWAVE AND RADAR ENGINEERING",** UMESH PUBLICATION, 2ND EDITION.
2. SCHOLNIK **"RADAR AND NAVIGATION",** MC GRAW HILL INTERNATIONAL, 1ST EDITION.
3. K. D. PRASAD **"ANTENNA AND PROPAGATION",**SATHYA PRADHASAN PUBLICATIONS.

SEM – I **Core Paper – II**

MICROCONTROLLER AND ITS APPLICATIONS

UNIT I : OVERVIEW AND INSTRUCTION SET

Microcontrollers and embedded processors – microcontrollers for embedded systems – over view of 8051 family – 8051 instruction set and registers

UNIT II : ASSEMBLY PROGRAMMING ADDRESSING MODES

8051 assembly programming – program counter – ROM – data types – directives – flag bits – PSW registers – register bank – stack – loop and jump instructions – I/O port programming – addressing modes

UNIT III : ARITHMETIC AND LOGICAL OPERATIONS IN ALP & C

Arithmetic instructions and programs – unsigned addition and subtraction – unsigned multiplication and division – logic instructions and programs – single bit instructions and programming

Programming with C : Data types – time delay programming – I/O programming – logic operations – arithmetic operations

UNIT IV : 8051 INTERRUPTS & PERIPHERALS

Basic registers of timer – programming of 8051 timer – counter programming – 8051 serial communication – 8051 connection to RS232 – 8051 serial communication programming – programming timer interrupts – 8051 interrupts – programming external hardware interrupts – programming with serial communication interrupts – peripheral and interrupt programming in C

UNIT V : REAL WORLD APPLICATIONS

LCD Interfacing – keyboard interfacing – parallel and serial ADC interfacing – DAC interfacing – sensor interfacing and signal conditioning – RTC interfacing – relays and optoisolator interfacing – stepper motor interfacing - DC motor interfacing and PWM

TEXT BOOK

1. Muhammad Ali Mazidi, Janice Gillispie Mazidi and Rolin D. McKinlay “THE 8051 MICROCONTROLLER AND EMBEDDED SYSTEMS USING ASSEMBLY AND C ” PHI, 2nd edition 2006

SEM – I **Core Paper – III**

MICRO ELECTRO MECHANICAL SYSTEMS AND POWER ELECTRONICS

UNIT I OVERVIEW AND WORKING PRINCIPLES OF MEMS

Mems and micro systems – typical mems and micro system products – micro systems and micro electronics – the multidisciplinary nature of micro system design and manufacture – application examples of micro systems – micro sensors – micro actuation – mems with micro actuators – micro accelerometers – micro fluidics.

UNIT II FABRICATION PROCESS OF MEMS

Materials for mems and micro systems – silicon as a substrate material – silicon compounds – silicon piezo resistors – photolithography – ion implantation – diffusion – oxidation – chemical vapour deposition – sputtering – deposition by epitaxy – etching – bulk micro manufacturing – surface micro machining – the liga process – micro system design considerations – process design – design of silicon die for a micro pressure sensor – computer aided design – micro system packaging – introduction to intelligence cad tool for mems.

UNIT III REVIEW OF OPERATION OF SCR, TRIAC AND UJT.

Thyristor commutation techniques: introduction – natural commutation – forced commutation – self commutation – impulse commutation – response pulse commutation – external pulse commutation – load side commutation – line side commutation – complementary commutation.

Controlled rectifiers – principle of phase controlled converter – single phase semi converter – single phase series converter – three phase controlled rectifiers .

UNIT IV STATIC SWITCHES

Introduction – single phase ac switches – three phase ac switches – three phase reversing switches – ac switches for bus transfer – dc switches – solid state relays.

AC VOLTAGE CONTROLLER

Introduction – principle of on/off control – principle of phase control – single phase bi-directional controllers with resistive loads & inductive loads - cyclo converters – single phase cyclo converters.

DC CHOPPERS :

Introduction – principles of step down operation – step down with rl load – principle of step up operation.

SWITCH MODE REGULATORS

Buck regulator – boost regulator – buck boost regulator – cuk regulator.

UNIT V : INVERTERS :

Introduction – principle of operation – single phase bridge inverter – three phase inverter. – Voltage control of single phase invertors .

POWER SUPPLIES :

Introduction – Dc Power Supplies – Switched Mode Dc Power Supplies –Resonant Dc Power Supplies – Bi Directional Power Supplies - Ac Power Supplies – Ups

REFERENCE BOOKS :

1. MUHAMMED RASHID **"POWER ELECTRONICS, CIRCUITS, DEVICES AND APPLICATIONS",** PRENTICE HALL EDITION, II EDITION, 1999.

2. SEN **"POWER ELECTRONICS"** - MCGRAW HILL INTERNATIONAL, 1989.
3. TAI-RAN-HSU **"MEMS AND MICRO SYSTEMS DESIGN AND MANUFACTURE"** - TMH.

SEM – I **Core Paper – IV**

LINEAR ICs AND APPLICATIONS

UNIT-I Operational amplifiers:

Ideal Op.Amps.-Practical Op.Amps., Internal structure, Open loop behavior, Op.Amp. parameters, DC performance, AC performance, Interpretation of data sheets, Inverting, non-inverting, DC, AC, differential amplifiers, Instrumentation amplifier, Bridge Amplifiers: Strain gage, bridge circuits for Measurement of small resistance changes and temperature, differentiators, integrators**.**

UNIT-II

Comparators, Voltage level detectors, Schmitt Triggers, linear half-wave rectifiers, precision rectifiers, peak detectors, Sample and Hold circuits, AC to DC converters, dead-zone circuits, Clippers, Clampers. Filters: Design of I, II and higher order filters. Butterworth, Chebyshev, Low pass, High pass, Band pass, Wide band, Narrow band, notch filters, Universal filters.

UNIT-III

Waveform generation: Sine wave generation - Wein bridge, phase shift oscillators; Multivibrators, triangular wave generators, sawtooth wave generators, voltage to frequency and frequency to voltage converters, voltage controlled oscillators. Multiplier: Analog multipliers, Applications of multipliers - Division, Square, square root, frequency doubler, rectifier and Phase shift detector circuits; Amplitude, Frequency, Pulse width modulation circuits, Demodulation**.**

UNIT-IV

PLL: Operating principles, functional blocks of PLL, stability analysis, Lock and Capture ranges, Applications of PLL - PLL as FM detector, FSK demodulator, AM detector, Frequency translator, Phase shifter, Tracking filter, Signal synchronizer, Frequency Synthesizer. 555 Timer: Functional block diagram, terminals, modes of operation, and applications.

UNIT-V

DAC: Principles – weighted-resistor network, R-2R ladder network, Current output DAC, MDAC, Specifications, ADC: Single slope, Dual slope Integration type ADC, Successive approximation ADCs, Flash converters. IC voltage regulators: Different types

Textbooks:

1. Coughlin, Driscoll "Operational amplifiers and Linear integrated circuits" -IVEd., PHI, 1992.
2. Ramakant A.Gayakwad "Op-Amps and Linear Integrated Circuits", II Ed., PHI, 1991.
3. Millman & Halkias "Integrated Electronics", Prentice Hall, 1999.
4. A. P. Malvino & D. P. Leach " Digital Principles & Applications," TMH, IV Ed. 2002.

Reference books:

1. K.R.Botkar "Integrated Circuits" - Khannan Publishers, 1991.
2. Sidney Soclof "Applications of Analog ICs" -PHI, 1990.
3. Roy Choudhry "Linear integrated circuits" –,New Age International, 1998.

SEM – II **Core Paper – V**

EMBEDDED SYSTEMS

UNIT I: INTRODUCTION TO EMBEDDED SYSTEMS

Definition and classification – Overview of microprocessor, Microcontroller, and DSP – exemplary high performance processors – CISC and RISC architecture – hardware unit in an embedded system- software embedded into a system – exemplary applications – embedded systems on a chip and in VLSI circuit

UNIT II: PIC 16F87X MICROCONTROLLERS

Device overview – architecture – memory organization – status register – option register – INTCON register – PCON register – I/O ports – data EEPROM – instruction set: Byte oriented operations – Bit oriented operations – Literal and Control operations

UNIT III: PERIPHERAL FEATURES OF 16F87X MICROCONTROLLERS

TIMER0 Module – TIMER1 Module – TIMER2 Module – Capture/Compare/PWM Modules – I2 C transmission and reception – USART – ADC Module - Special features of the CPU : oscillator selection – power on reset – power up timer – oscillator start up timer – brown out reset – interrupts – watchdog timer

UNIT IV: REAL TIME OPERATING SYSTEMS

Definitions of process, tasks, and threads – Operating system services – goals – structures- kernel – process management – memory management – device management – file system organization and implementation – I/O sub systems – interrupt routine handling in RTOS – RTOS task scheduling models – handling of task scheduling – latency – deadlines – round robin scheduling – cyclic scheduling – preemptive – critical session – static real time scheduling – IPC and synchronization – use of semaphore – priority inversion – deadlock – IPC using signals – mutex- flag- message queues – mailboxes – pipes- virtual sockets – remote procedure calls

UNIT V: RTOS Programming Tools: Micro C/OS-II and Vxworks

Study of Micro C/OS-II – VxWorks – other popular RTOS – RTOS system level functions – task service functions – time delay functions – memory allocation related functions – semaphore related functions – mailbox related functions – queue related functions case studies of programming with RTOS – understanding case definition - multiple tasks and their functions – creating a list of tasks- functions and IPCs – exemplary coding steps

TEXT BOOKS

1. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill, First reprint, 2003.

2. PIC 16F87X data book, Microchip Technology Inc., 2001(www.microchip.com)

SEM – II **Core Paper – VI**

VHDL PROGRAMMING

UNIT 1 : INTRODUCTION AND BASIC CONCEPTS OF VHDL

History of VHDL – capabilities of VHDL – hardware abstraction – basic terminology – entity declaration – architecture body declaration – basic language elements – identifiers – data objects – data types – operators.

MODELING TECHNIQUES OF VHDL

UNIT 2: BEHAVIORAL MODELING:

Entity Declaration – Architecture Declaration – Process Statements – Variable Assignment Statements – Signal Assignment Statement – Wait Statement – If Statement – Case Statement – Null Statement – Loop Statement – Exit Statement – Next Statement – Assertion Statement – Report Statement – More On Signal Assignment Statement – Multiple Process – Postponed Process.

UNIT3: DATA FLOW MODELING AND STRUCTURAL MODELING:

DATA FLOW MODELING: Concurrent Signal Assignment Statement – Concurrent Versus Signal Assignment – Delta Delay Revisited – Multiple Drivers – Conditional Signal Assignment Statement – Selected Signal Assignment Statement – The Unaffected Value – Block Statement – Concurrent Assertion Statement – Value Of A Signal.

STRUCTURAL MODELING: Component Declaration – Component Instantiation – Resolving Signal Value – Examples – Half Adder – Full Adder – 4 To 1 Multiplexer – Decoder And Encoders.

UNIT 4 :ADVANCED FEATURES IN VHDL

Generics - configuration - configuration specification - configuration declaration - default rules - conversion functions - direct instantiation – incremental binding – subprograms – subprogram overloading – operator overloading – signatures – default value of parameters – package declaration – package body – design file – design libraries – order of analysis – implicit visibility – explicit visibility – attributes in VHDL

UNIT 5: DESIGN OF FPGA'S AND CPLD

State machine chart – programmable logic array – programmable logic array devices – altera max 7000 CPLD's – xilinx xc 4000 structures – xilinx interconnection – xilinx logic – xilinx 3000 series FPGA's – altera complex programmable logic devices – altera flex 10 k series CPLD's.

TEXT BOOKS :

1. J.BASKAR "VHDL PRIMER" J.BASKAR, THIRD EDITION, PEARSON EDUCATION.
2. JR CHARLES H.ROTH "DIGITAL SYSTEM DESIGN USING VHDL" , BROOKS / COLE THOMSON LEARNING PUBLISHING.

REFERENCE BOOKS:

1. MORRIS MANO AND CHARLES R. KIME "LOGIC CIRCUIT LAYOUT DESIGN" , ,SECOND EDITION , PERSON EDUCATION , ASIA.
2. DOUGLAS L PERRY "VHDL PROGRAMMING BY EXAMPLES", , II ED,-TMH

SEM – II **Core Paper – VII**

DSP ARCHITECTURE AND PROGRAMMING

UNIT I FUNDAMENTALS OF PROGRAMMABLE DSPs

Multiplier and Multiplier accumulator – Modified Bus Structures and Memory access in P-DSPs – Multiple access memory – Multi-port memory – VLIW architecture- Pipelining – Special Addressing modes in P-DSPs – On chip Peripherals.

UNIT II TMS320C5X PROCESSOR

Architecture – Assembly language syntax - Addressing modes – Assembly language Instructions - Pipeline structure, Operation – Block Diagram of DSP starter kit – Application Programs for processing real time signals.

UNIT III: THE FAST FOURIER TRANSFORM

Introduction – Direct Evaluation of the DFT – The FFT – Radix-2: Decimation-in-time algorithm and Decimation-in-frequency algorithm – IDFT using FFT algorithm – Application of FFT algorithm.

UNIT IV: STRUCTURES FOR DISCRETE TIME SYSTEMS

Introduction – block diagram and signal flow graph representation – basic structures for IIR system: Direct, canonic, cascade and parallel – basic structures for FIR systems: Direct, canonic, Cascade and Linear phase.

UNIT V: FILTER DESIGN TECHNIQUES

Introduction – design of discrete time IIR filters from continuous time filters – frequency transformation of low pass IIR filters – design of FIR filters by windowing – comments on IIR
and FIR digital filters.

REFERENCES

1. B.Venkataramani and M.Bhaskar, "Digital Signal Processors – Architecture, Programming and Applications" – Tata McGraw – Hill Publishing Company Limited. New Delhi, 2003.
2. P. Ramesh babu, "Digital signal processing",2nd edition-Scitech publication
3. John G.Proakis, Dimitris G. Manolakis, D.Sharma, "Digital signal processing principles, Algorithms, and Applications" –Pearson Education, 2006

SEM – II **Core Paper – VIII**

HIGH PERFORMANCE COMMUNICATION NETWORKS

UNIT I: DATA COMMUNICATION

Introduction – Basic terms and concepts – Line configurations – Topology – Transmission media – MODEM: Standard and types – Analog and Digital transmission: Encoding and modulating – Channel capacity - Base band and Broad band - Transmission impairments – Multiplexing – Error Detection and control :CRC.

UNIT II: STANDARD ARCHITECTURE AND PROTOCOLS

Layered Architecture – OSI model –functions of layers – Data link control protocols – ARQ-Stop and wait, Sliding window, Go back N and Selective repeat– Asynchronous protocol: X Modem, Y Modem, Kermit – Synchronous protocol: BSC, SDLC, HDLC- TCP/IP model, SMTP, HTTP and FTP.

UNIT III: NETWORK STANDARDS

LAN: Standard, Protocol, IEEE 802 Standards – ETHERNET, LLC, MAC, CSMA/CD, Token Ring – Token bus – FDDI – ALOHA, Wireless LAN Technology, Hub, Bridge, Router, gateway, X.25.Protocols: SLIP, PPP, LCP – Optical network – SONET, WAN - MAN- Basic Concept and standards.

UNIT IV: ISDN

Introduction: Services – IDN – Channels – User interfaces – ISDN layers –Broad band ISDN –Frame relay – ATM: concept and architecture – ISDN Protocol: Physical layer protocol, D-channel Data link layer and layer 3 protocols, Network signaling systems, SS7 protocol.

UNIT V: UPPER OSI LAYERS

Session layer protocols, Presentation layer – Encryption / Decryption, Data security, Encryption/ Decryption, Authentication, Data compression, Application Layer Protocols – MHS, File Transfer, Virtual Terminal, CMIP.

TEXT BOOK

1. BEHROUS. A.FOROUZAN “DATA COMMUNICATION AND NETWORKING”, 2ND EDITION, TATA MCGRAW HILL, 2000.

REFERENCE BOOKS

1. Jean Walrand and Pravin varaiya, “High Performance Communication networks”, 2nd edition, Harcourt and Morgan Kauffman, London 2000.
2. William Stallings,”High-speed Networks and Internets”, 2nd edition, Pearson education Asia, 2003.
3. GARY C. KESSLAR and PETER SOUTHWICK “ISDN – Concepts, Facilities and Services”, MCGRAW HILL, 3RD EDITION, 1997.
4. William Stallings “Data and computer communication” 6th edition, Pearson education, 2000
5. ANDREW S.TANENBAUM “Computer Networks”, 3rd edition, PRENTICE HALL OF INDIA, 1996.

PRACTICAL I **Core Practical – I**

GENERAL ELECTRONICS LAB
(ANY 20 EXPERIMENTS)

1. GENERATION & DETECTION OF AM.
2. GENERATION & DETECTION OF FM.
3. GENERATION & DETECTION OF PAM.
4. GENERATION & DETECTION OF PWM.
5. TUNNEL DIODE OSCILLATOR AND GUNN DIODE OSCILLATOR
6. OP – AMP CHARACTERISTICS.
7. V TO I & I TO V CONVERTORS.
8. HALF WAVE RECTIFIER AND FULL WAVE RECTIFIER USING OP-AMPS.
9. INTEGRATOR AND DIFFERENTIATOR USING OP-AMPS.
10. DESIGN OF LOW PASS AND HIGH PASS FILTERS.
11. DESIGN OF BAND PASS, BAND REJECT & NOTCH FILTERS.
12. INSTRUMENTATION AMPLIFIER
13. TRIANGULAR & SAW TOOTH WAVE GENERATORSUSING OP.AMPS.
14. SQUARE WAVE GENERATOR & SCHMITT TRIGGER USING OP.AMPS.
15. HARTLEY & COLPITTS OSCILLATOR USING OP-AMPS.
16. PHASE SHIFT AND WEIN BRIDGE OSCILLATOR USING OP-AMPS.
17. ASTABLE AND MONOSTABLE MULTI-VIBRATORS USING 555.
18. VOLTAGE CONTROLLED OSCILLATOR USING 566.
19. ANY TWO APPLICATIONS USING IC565
20. FUNCTION GENERATOR USING 8038.
21. DUAL POWER SUPPLY USING 78XX AND 79XX
22. ADJUSTABLE POSITIVE AND NEGATIVE VOLTAGE REGULATOR USING LM 317 & LM337
23. LOW AND HIGH VOLTAGE REGULATOR USING LM 723
24. AC POWER CONTROL USING THYRISTORS.
25. SWITCHING CIRCUITS FOR TRIAC.
26. THYRISTOR CHOPPER.
27. SINGLE PHASE INVERTOR (20W)
28. POWER AMPLIFIER USING LM 380.

PRACTICAL II **Core Practical – II**

EMBEDDED & VHDL LAB
(20 EXPERIMENTS)

(i) MICRO CONTROLLER LAB (8051) & PIC 16F877)
(10 EXPERIMENTS)

1. ARITHMETIC AND LOGICAL PROGRAMS
2. OBJECT COUNTER
3. SQUARE WAVE FORM GENERATION USING PORT LINES
4. INTERFACING OF A SINGLE SEVEN SEGMENT DISPLAY
5. ADC INTERFACE
6. STEPPER MOTOR INTERFACE
7. DIGITAL CLOCK
8. DATA TRANSFER WITH THE PARALLEL PORT.
9. LCD INTERFACING
10. INTERFACING OF A SOLID STATE RELAY.
11. DAC INTERFACE.
12. PWM GENERATION.
13. SERIAL DATA COMMUNICATION.

(ii) VHDL LAB
(SIMULATION USING MODEL SIMULATOR SOFTWARE OR IMPLEMENTATION USING CPLD/FPGA TRAINER KITS).
(10 EXPERIMENTS)

1. IMPLEMENTATION OF SAMPLE PROGRAMS IN CPLD OR FPGA KIT
2. SIMPLE LOGIC GATES
3. HALF ADDER AND FULL ADDER
4. HALF SUBTRACTOR AND FULL SUBTRACTOR
5. ENCODER AND DECODER
6. MULTIPLEXER AND DEMULTIPLEXER
7. SOLVING BOOLEAN EQUATIONS
8. FLIP – FLOPS
9. DIGITAL COUNTERS
10. SHIFT REGISTERS AND RING COUNTER
11. 4 BIT AND 8 BIT MULTIPLIER
12. ARITHMETIC AND LOGIC UNIT
13. DESIGN OF MEMORY IC’S
14. PROGRAMMABLE LOGIC ARRAY
15. STATE MACHINE MOORE MODEL

SEM – III **Core Paper – IX**

ADVANCED DIGITAL IMAGE PROCESSING

UNIT I: DIGITAL IMAGE FUNDAMENTALS

Elements of a digital image processing system – structure of the human eye – image formation and contrast sensitivity – sampling and quantization – neighbors of pixel – distance measure – photographic film structure and exposure – film characteristics – linear scanner – video camera – image processing applications.

UNIT II: IMAGE TRANSFORMS

Introduction to Fourier transform – DFT – properties of two-dimensional FT – separability,
translation, periodicity, rotation, average value – FFT algorithm – Walsh transform – Hadamard transform – discrete cosine transform.

UNIT III: IMAGE ENHANCEMENT

Definition – spatial domain methods – frequency domain methods – histogram – modification techniques – neighborhood averaging – median filtering – low pass filtering – averaging of multiple images – image sharpening by differentiation and high pass filtering.

UNIT IV: IMAGE ENCODING

Objective and subjective fidelity criteria – basic encoding process – the mapping – the quantizer– the coder – differential – encoding – contour encoding – run length encoding - image encoding – relative to fidelity criterion – differential pulse code modulation.

UNIT V: IMAGE ANALYSIS AND COMPUTER VISION

Typical computer vision system – image analysis techniques – spatial feature extraction – amplitude and histogram features - transforms features – edge detection – gradient operators – boundary extraction – edge linking – boundary representation – boundary matching – shape representation.

TEXT BOOK

1. Rafael C. Gonzalez, Paul Wintz, “Digital Image Processing”, Addison-Westley Publishing
Company, 1987
2. Rafael C. Gonzalez, Richard E Woods “Digital Image Processing”, Pearson, 2001

SEM – III **Core Paper – X**

PC BASED SYSTEM DESIGN

UNIT I HARDWARE AND MOTHER BOARD ORGANIZATION OF IBM PC

Introduction to computer organization – components of IBM PC: system unit – monitor – input device – printers – interfaces – i/o buses – parallel and serial ports – USB – motherboard logic.

I/o data transfer – DMA channels – peripheral interface and controllers – memory space – memory refresh – post sequence.

UNIT II DRIVES

Introduction – principles of magnetic storage – floppy disk drive – hard disk drive – drive formatting – physical & logical formatting – IDE interface – SCSI interface – CD-ROM drive – bios disk drive devices – fat details.

UNIT III PERIPHERALS

Introduction – video display system – video adapter – colour graphic adapter – CRT display controller – keyboard – keyboard interface – mouse – printer.

UNIT IV I/O BUSES AND PORTS

Introduction – ISA bus – MCA bus – EISA bus – local buses – VL bus – PCI bus – AGP.

Introduction – parallel port – serial port – introduction to USB – features of USB – USB transfer – USB controller.

UNIT V TROUBLESHOOTING

Introduction – computer faults – nature of faults – types of faults – diagnostic programs and tools – fault elimination process – systematic troubleshooting procedure – motherboard problems – FDD, FDC problems - HDD, HDC problems – monitor problems – serial port problems – keyboard problems – SMPS problems-printer problems.

REFERENCE BOOKS

1. B. GOVINDARAJULU **"IBM PC AND CLONES",** , TATA MCGRAW HILL.2ND EDITION.
2. N. MATHIVANAN **"MICROPROCESSORS, PC HARDWARE AND INTERFACING",**
, PHI.
3. ROBERT C. BRENNER **"IBM PC TROUBLESHOOTING AND REPAIR GUIDE",** , BPB PUBLISHERS.
4. PETER NORTON **"INSIDE THE IBM PC AND PS/2",** , PHI PUBLISHERS, FOURTH EDITION.
5. STEPHEN J BIGELOW **"TROUBLESHOOTING MAINTAINING AND REPAIRING PC'S"**, TATA MCGRAW HILL COMPANY, IIND EDITION.

SEM – III **Core Paper – XI**

WIRELESS COMMUNICATION ENGINEERING

UNIT I: SIGNAL ENCODING TECHNIQUES

Signal encoding techniques: criteria– Digital data, Analog signals ASK- FSK – BFSK – MFSK – PSK – BPSK – QPSK – multilevel PSK – Analog data, Analog signals AM modulation – Angle modulation –Analog data, Digital signals PCM - delta and adaptive delta modulation

UNIT II: CODING AND ERROR CONTROL

Error detection – parity check – cyclic redundancy check – block error correction codes –
hamming code – cyclic codes – BCH code – reed-Solomon codes – block interleaving – convolution codes – decoding – turbo coding – automatic repeat request – flow control – error control.

UNIT III: SATELLITE COMMUNICATION

Satellite parameters and configurations – satellite orbits – GEO – MEO – LEO – frequency
bands – transmission impairments – satellite footprint – atmospheric attenuation – satellite network – configuration – capacity allocation- Capacity allocation FDM – Capacity allocation TDM.

UNIT IV: CELLULAR WIRELESS NETWORKS

Principles of cellular networks: organization – frequency reuse – operation – mobile radio
propagation effects – handoff – power control – traffic engineering – first generation analog – AMPS – second generation – TDMA – mobile wireless TDMA design consideration - Overall GSM Architecture – Second generation CDMA – mobile wireless CDMA design considerations – soft hand off – – third generation systems.

UNIT V: WIRELESS LANS

Over view: Wireless LAN applications – Wireless LAN requirements – Wireless LAN technology – Infrared LANs – Spread Spectrum LANs – Narrow band microwave LANs – IEEE 802 Architecture – IEEE 802.11 Architecture and Services.

TEXT BOOKS

1. "WIRELESS COMMUNICATIONS AND NETWORKS" by WILLIAM STALLINGS 2002 – PEARSON EDUCATION ASIA

REFERENCES:

1. T.S.Rappaport "Wireless Communication" Pearson Education, 2002
2. E.A.Lee and D.G.Messerschmitt "Digital Communication" 2nd Ed., Allied Pub,1994.
3. John .G.Proakis "Digital Communications" 4th Ed. Mc Graw Hill Int. Ed.,2000.

SEM – III **Core Paper – XII**

NANO ELECTRONICS AND SYSTEMS

UNIT I INTRODUCTION, SURVEY OF MODERN ELECTRONICS

Diode as Basic Element of Electronics, Field Effect of Transistors, Heterostructure transistors, Resonant-Tunneling diodes and transistors Need for New Concepts in Electronics, From Microelectronics towards Bimolecular Electronics

UNIT II BASIC CONCEPTS OF ELECTROMAGNETIC WAVES AND QUANTUM MECHANICS

Electromagnetic Waves and Maxwell's Equations, Duality of Electron, Schrödinger Equation, Eigenvalue Problem and Electron in Quantum Well, Electrons in Multiple Quantum Wells. Super lattices Artificial Atoms: Quantum Dots, Molecules, Energy Level Splitting, Chemical Bonds,Optical Transitions and Lasers

UNIT III ROLE OF PATTERN FORMATION IN NANOELECTRONICS

High Resolution Lithography, Dip-Pin Lithography, NEMS, Nano-Electro-mechanical Systems, Self-Assembly structures – Chemically Directed Self-Assembly, Surface-Layer Proteins in nanolithography

UNIT IV TRADITIONAL LOW-DIMENSIONAL SYSTEMS

Quantum Well cascade Lasers and other Quantum-Well Devices, Quantum Wires, Quantum Dots and Quantum Dot molecules, Quantum Dot Based cellular Automata, Coulomb Effects, Single Electron Devices Nanoscale sensors and Actuators

UNIT V NEWLY EMERGED NANOSTRUCTURES

Challenges and Potential Applications of Inorganic Hetero structures, Quantum Dots Embedded in organic Matrix, organic light emitting diodes, Quantum Wire Interconnects, DNA and Peptides, Fullerenes and carbon nanotubes, Molecular Electronics Materials and Biomolecules, Future Integrated circuits: Quantum computing

Text Books:

1. C.P. Poole and F.J.Owens, " Introduction to nanotechnology",John Wiley & Sons,2003
2. M.A. Ratner and D.Ratner, " Nanotechnology ; a gentle introduction to the next big idea" ,
   Prentice Hall,2002
1. Nanometer structures:theory,modeling and simulation" Editor:Akhlesh Lakhtakia, ASME Press
2. S.E.Lyshevski,"Nano-and micro-electrochemical systems fundamentals of nano and microengineering ,2004.

PRACTICAL III

PC HARDWARE LABORATORY

(ANY 12 EXPERIMENTS)

1. STUDY OF DOS AND WINDOWS COMMANDS.
2. FAULT ELIMINATION PROCEDURE.
3. MOTHERBOARD PROBLEMS.
4. KEYBOARD PROBLEMS.
5. STUDY OF MOUSE
6. STUDY OF FDD PROBLEMS.
7. STUDY OF HDD PROBLEMS.
8. STUDY OF DISPLAY PROBLEMS.
9. FORMATTING FDD.
10. FORMATTING HDD.
11. SEGMANTATION OF HDD.
12. OPTOCOUPLER INTERFACING USING PC.
13. TEMPATURE MEASURMENT USING PC.
14. SPEED CONTROL OF DC MOTOR USING PC.
15. ASSEMBLING OF PC.
16. INTERFACING WITH SERIAL AND PARALLEL PORTS.
17. INSTALLATION OF OPERATING SYSTEMS [OS].
18. PC TO PC SYNCHRONARZATION.
19. NETWORK TROUBLE SHOOTING.
20. SMPS TROUBLESHOOTING.

SEM – III **Core Practical – IV**

DSP AND DIP LABORATORY
(ANY 12 EXPERIMENTS)

USING TMS320C5X/TMS320C54XX/TMS320C67XX

1. STUDY OF ADDRESSING MODES OF DSP USING SIMPLE EXAMPLES
2. ARITHMETIC OPERATIONS
3. DFT COMPUTATIONS
4. FFT COMPUTATIONS
5. CONVOLUTION OF TWO DISCRETE SIGNALS
6. CORRELATION OF TWO DISCRETE SIGNALS
7. WAVEFORM GENERATION
8. SOLVING DIFFERENTIAL EQUATIONS
9. SOLVING Z-TRANSFORM
10. VOICE STORING & RETRIEVAL
11. FIR FILTER DESIGN
12. IIR FILTER DESIGN

SIMULATION USING MATLAB

DSP

13. GENERATION OF SIGNALS
14. AMPLITUDE MODULATION & FFT RESPONSE
15. IMPULSE, STEP, EXPONENTIAL & RAMP FUNCTIONS
16. FREQUENCY SAMPLING METHOD
17. DESIGN OF FIR FILTER
18. DESIGN OF IIR FILTER

DIP

19. IMAGE SAMPLING – ZOOMING & SHRINKING OPERATIONS
20. BASIC GRAY LEVEL TRANSFORMATIONS: IMAGE NEGATIVE, POWER LAW AND LOG TRANSFORMS
21. 2-D DISCRETE FOURIER TRANSFORM AND WALSH TRANSFORM
22. IMAGE CONTRAST ENHANCEMENT BY HISTOGRAM EQUALIZATION TECHNIQUE
23. SPATIAL IMAGE FILTERING: LOW PASS AND HIGH PASS FILTERING

GROUP A ELECTIVE: **SEM – I**

ELECTIVE PAPER I : WEB TECHNOLOGIES

UNIT I

Internetworking concepts – Devices: Repeaters – Bridges – Routers – Gateways – Internet topology Internal Architecture of an ISP – IP Address – Basics of TCP – Features of TCP – UDP.

UNIT II

DNS – Email – FTP – HTTP – TELNET- Electronic commerce and Web technology – Aspects – Types – E-procurement models – Solutions – Supply chain management – Customer Relationship Management – Features Required for enabling e-commerce –Tiers – Concepts of a Tier

UNIT III

Web page – Static Web pages – Dynamic Web pages – DHTML – CGI – Basics of ASP technology – Active Web pages - User Sessions: Sessions and session Management – Maintaining state information - Transaction Management: Transaction Processing monitors – object Request Brokers – Component transaction – monitor – Enterprise Java Beans.

UNIT IV

Security issues: Basic concepts – cryptography – Digital signature – Digital certificates – Security Socket Layer (SSL) – Credit card Processing Models – Secure Electronic Transaction – 3D Secure Protocol – Electronic money. Electronic Data Interchange: Overview of EDI – Data Exchange Standards – EDI Architecture – EDI and the Internet

UNIT V

Extensible Markup Language (XML) – Basics of XML – XML Parsers – Need for a standard – Limitations of Mobile Devices – WAP Architecture – WAP stack – Object Technology.

TEXT BOOK

1. Achyat.S.Godbole and Atul Kahate, “Web Technologies”, Tata McGraw Hill Pub. Co, Delhi, 2006.

REFERENCES

1. Ellote Rusty Harold, “Java Network Programming”, O’Reilly Publications, 1997.
2. Jason Hunter, William Crawford, “Java Servlet Programming”, O’Reilly Publications, 1998.

GROUP A ELECTIVE: PAPER II
SEM – II RELATIONAL DATA BASE MANAGEMENT SYSTEMS

UNIT I : INTRODUCTION
Purpose of Database systems- View of Data-Data Models-Database Languages-Transaction Management-Storage Management Database Administrator- Database Users-System Structure.

ENTITY Relationship Model: Basic concepts-keys-Entity Relationship Diagram, Weak Entity sets, E-R Features. **Data Modeling and Normalization**: Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams - Denormalization – Another Example of Normalization.

UNIT II : ORACLE TABLES
DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table.

UNIT-III: WORKING WITH TABLE: DATA MANAGEMENT AND RETRIEVAL
DML – adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records -restricting Data with WHERE clause –Sorting – **Functions and Grouping**: Built-in functions –Grouping Data.

UNIT-IV: MULTIPLE TABLES:
Join & Set operators- Join-set operators. **Sub queries:** Sub query-EXIST and NOT EXIST operators. **PL/SQL: A Programming Language:** Block Structure –Comments – Data Types – – Variable Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators.

UNIT V: CONTROL STRUCTURES AND EMBEDDED SQL
Control Structures – Nested Blocks – SQ L in PL/SQL – Data Manipulation in PLSQL .**PL/SQL Cursors and Exceptions:** Cursors-Type of Cursors-Cursors Variables-Exceptions. Triggers.

TEXT BOOK
Abraham Silberschatz, Henry F.Korth,S.Sudharson, ”Database Concepts”, Tata McGraw Hill
International Editions-1997.

Reference Books:
1. Alexis Leon and Mathews Leon,”Database Management Systems”Vikas pub
2. Elmasri Navathw, “Fundamentals of Database Systems”, Pearson Education pub, 3rd Edition 2001.

GROUP A ELECTIVE: **SEM - III**

PAPER III: LINUX & SHELL PROGRAMMING

UNIT I: WELCOME TO LINUX

Overview of LINUX-Additional Features in LINUX .**The LINUX Operating System:** Logging In-Working with the shell.

UNIT II: LINUX SYSTEM START UP & SHUTDOWN

Introduction Brief outline of X86 LINUX booting process. **System Logging:** Logging – Accounting-Available Graphical Tools.

UNIT III: FILE FILTERS

File Related Commands-Introduction to Piping –Some other means of joining commands-awk commands.

UNIT IV: SHELL PROGRAMMING

Introduction-programming constructors. **The Shell:** Command line-Standard Inputs & Standard output-Filename Generation/pathname expansion.

UNIT V: THE VIM EDITOR

Introduction to Vim features-Command Mode: Moving the cursor-Deleting & changing text -Input mode. **Computing C & C++ Programs under LINUX:** Introduction to C Compiler-Computing a Multi source C Program-How main is executed on LINUX-Compiling single source C++ Program

Text Book

1. Mark G. Sobell, "**A Programming Guide to LINUX Commands, Editors and shell programming**", Pearson Education (Unit I,2nd Half Unit IV,1st half Unit V)
2. N.B. Venkateswarlu," **Introduction to LINUX: Installation and Programming** ", BS Publications (Unit II,III,Ist half Unit IV, 2nd Half Unit V)

GROUP A ELECTIVE: **SEM – IV**

ELECTIVE PRACTICAL: RDBMS AND LINUX LABORATORY

RDBMS LABORATORY (ANY 8 EXPERIMENTS)

1. Creating Tables and writing simple Queries using

a) Comparison Operators, b) Logical Operators, c) Set Operators, d) Sorting and Grouping

2. Creation of Reports using Column format
3. Writing Queries using built in functions
4. Updating and altering tables using SQL.
5. Creation of Students Information table and write PL/SQL Block find the Total, Average marks and Results.
6. Write a PL/SQL block to prepare the Electricity Bill.
7. Splitting the table: Write a PL/SQL block to split the students information table into two, one with the Passed and other failed.
8. Joining the Tables-Write a PL/SQL Block to join two tables, First table contain Roll Number, Name, Total and Second Table contains the Roll. No and Address.
9. Create a Database Trigger to check the data validity of Record.
10. Recursive Functions write a Recursive Function to find
    a) Factorial of N
    b) Fibonacci Series with N terms.
11. Write a Recursive function to create as sequence of Roll nos using sequence.
12. Write a Database Trigger to implement the Master Detail Relationship.
13. Front and tools.
14. High level programming language extension
15. Menu Design.
16. Data definition, Manipulation of base tables and views.

LINUX LABORATORY (ANY 8 EXPERIMENTS)

1. Write a Shell script to Wish the User according to Present Time.(i.e GOOD MORNING,GOOD AFTERNOON etc)
2. Write a shell program to print the sum of all digits
3. Write a shell program which informs as soon as a specified user whose name is given along the command line is logged into the system
4. Write a shell program to print the following series

```
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
6 6 6 6 6 6
```

5. Write a shell program which takes a source file name & directories names as command line arguments & print the message.
6. Write a shell script which removes empty files from PWD & changes other file time stamps to current time
7. Write a shell program which reads a digit & prints its BCD code
8. Write a shell program which reads a filename along the command line & prints frequency of the occurrence of words
9. Write shell script to see current date time username & current directories.
10. Write script to determine whether given file exist or not, file name is supplied as command line argument, also check for sufficient number of command line argument

GROUP B ELECTIVE: **SEM – I**

PAPER I: ELECTRONIC TEST INSTRUMENTS

UNIT I ANALOG METERS

D.C,A.C voltmeters, ammeters, multimeter, power meter, Q-meter,true RMS meter, vector impedance meter, vector voltmeter, component measuring instrument.

UNIT II SIGNAL SOURCES

Sine wave generator-Frequency synthesized sine wave generator-Sweep frequency generator, pulse and square wave generator-Function generator-Wave analyzer-Applications-Harmonic distortion analyzer-Spectrum analyzer-Applications-Audio Frequency generator-Noise generator.

UNIT III OSCILLOSCOPES

General purpose oscilloscope-Screens for CRT -Vertical & horizontal deflection systems- Time base operation, triggers – sweep control, z axis input – Delay line-Multiple trace- Dual beam & dual trace-Probes-Oscilloscope techniques-special oscilloscopes-Storage oscilloscope-sampling oscilloscope-digital CRO.

UNIT IV DIGITAL INSTRUMENTS

Digital method for measuring frequency, period, phase difference, pulse width, time interval, total count-Digital voltmeter-Types-Automatic polarity indication, automatic ranging, and auto zeroing-DMM-Microprocessor based DMM-DPM-swept – spectrum analyzer-network analyzer- discharge analyzer- logic probes-logic analyzer.

UNIT V DISPLAY AND RECORDING DEVICES

Bar graph display-Segmental and dot matrix display-X-Y recorders, magnetic tape recorders- Digital recording-Data loggers-Interference and screening-Electrostatic and electromagnetic interference & earth loops.

TEXT BOOKS

1.Albert D. Herlfrick & William D. Cooper, "Modern electronic Instrumentation
& Measurement Techniques" Prentice Hall of India,2002.
2.A.J.Bouwens,'Digital Instrumentation" Tata Mc Graw Hill, 1997.
3.RobertA.Witte,'Electronic Test Instruments,Theory and applications' Prentice Hall, 1993.

REFERENCE BOOKS

1.B.M.Oliver and J.M.Cage,"Electronic Measurements & Instrumentation" Mc Graw Hill International Edition, 1975.
2.Joseph, J.Carr,"Elements of Electronic Instrumentation & Measurements" III edition, Pearson Education,2003.
3.C.S.Rangan, G.R.sarma, V.S.V.Mani,"Instrumentation Devices & systems" Tata Mc Graw Hill, 2002
4.D.A.Bell, "Electronic Instrumentation and Measurements" Prentice Hall of India,2002.
5.Rajendra Prasad,"Electronic Measurements and Instrumentation", Khanna Publishers, Delhi,2003.
6.B.R.Gupta,"Electronics and Instrumentation"S.Chand Co. (P)Ltd., Delhi,

GROUP B ELECTIVE: **SEM – II**

PAPER II: ANALYTICAL INSTRUMENTATION

UNIT 1: COLORIMETRY AND SPECTROPHOTOMETRY

Special methods of analysis- Beer-Lambert law-colorimeters - UV-ViS spectrophotometers- Single and double beam instruments-Sources and detectors-IR Spectrophotometers-Types- Attenuated total reflectance flame photometers- Atomic absorption spectrophotometers-sources and detectors-FTIR spectrophotometers-Flame emission photometers.

UNIT 2: CHROMOTOGRAPHY

Different techniques- Gas chromatography- Detectors- Liquid chromatographs-Applications - High pressure liquid chromatographs-Applications.

UNIT 3: INDUSTRIAL GAS ANALYZERS AND POLLUTION MONITORING INSTRUMENTS

Types of gas analyzers-Oxygen,NO2 and H2S types, IR analyzers, thermal conductivity analyzers, analysis based on ionization of gases. Air pollution due to carbon monoxide, hydrocarbons, nitrogen oxides, sulphur dioxide estimation-dust and smoke measurements.

UNIT 4: PH METERS AND DISSOLVE COMPONENT ANALYZERS

Principle of pH measurement, glass electrodes, hydrogen electrodes, reference electrodes, selective ion electrodes, ammonia electrodes, biosensors, dissolved oxygen analyzer-sodium analyzer-silicon analyzer.

UNIT 5: RADIO CHEMICAL AND MAGNETIC RESONANCE TECHNIQUES

Nuclear radiations – Detectors - GM Counter - Proportional counter - Solid state detector - Gamma cameras - X-ray spectroscopy - Detectors- Diffractometers -Absorption meters - Detectors NMR-Basic principles-NMR spectrometer-Applications. Mass spectrometers - Different types - Applications.

Text Books:

1.R.S.Khandpur,"Handbook of Analytical Instruments"Tata Mc Graw Hill publishing Co. Ltd.2003.
2.H.H.Willard, L.L.Merrit, J.A.Dean, F.A.Settle,"Instrumental methods of analysis" CBS publishing & distribution, 1995.

References:

1.Robert D.Braun,"Introduction to Instrumental Analysis"Mc Graw Hill, Singapore,1987
2.G.W.Ewing,"Instrumental Methods of Analysis" Mc Graw Hill
1992.
3.DA Skoog and D.M.West,"Prinicples of Instrumental Analysis" Harper and Row publishers,1974.

GROUP B ELECTIVE: **SEM – III**

PAPER III: VIRTUAL INSTRUMENTATION

UNIT I : INTRODUCTION

General functional description of a digital instrument - Block diagram of a Virtual Instrument - Physical quantities and Analog interfaces - Hardware and Software - User interfaces - Advantages of Virtual instruments over conventional instruments - Architecture of a Virtual instrument and its relation to the operating system

UNIT II : SOFTWARE OVERVIEW

LabVIEW - Graphical user interfaces - Controls and Indicators - 'G' programming - Labels and Text - Shape, Size and Color - Owned and free labels - Data type, Format, Precision and representation - Data types - Data flow programming - Editing - Debugging and Running a Virtual instrument - Graphical programming palettes and tools - Front panel objects - Functions and Libraries.

UNIT III : PROGRAMMING STRUCTURE

FOR loops, WHILE loops, CASE structure, formula nodes, Sequence structures - Arrays and Clusters - Array operations - Bundle - Bundle/Unbundle by name, graphs and charts - String and file I/O - High level and Low level file I/O's - Attribute modes Local and Global variables. **OPERATING SYSTEM AND HARDWARE OVERVIEW:** PC architecture, current trends, Operating system requirements, Drivers – Interface Buses – PCI Bus – Interface cards – specification – Analog and Digital interfaces – Power, Speed and timing considerations.

UNIT IV : HARDWARE ASPECTS

Installing hardware, Installing drivers - Configuring the hardware - Addressing the hardware in LabVIEW - Digital and Analog I/O function - Data Acquisition - Buffered I/O - Real time Data Acquisition.

UNIT V : LABVIEW APPLICATIONS

IMAQ - Motion Control: General Applications - Feedback devices, Motor Drives – Instrument Connectivity - GPIB, Serial Communication - General, GPIB Hardware & Software specifications - PX1 / PC1: Controller and Chassis Configuration and Installation.

TEXT BOOKS:

1. Garry M Johnson, "Labview Graphical Programming", Tata McGraw Hill, New Delhi, 2nd Edition, 1996.
2. Robert H.Bishop,"Learning with Lab-View" Prentice Hall, 2003.
3. Labview : Basics I & II Manual, National Instruments, 2005.

REFERENCES :

1. Lisa K Wells, "Labview for Everyone", Prentice Hall of India, New Delhi, 1996.
2. Barry Paron, "Sensor, Transducers and Labview", Prentice Hall, New Delhi, 2000.

GROUP B ELECTIVE: **SEM – IV**

PRACTICAL: INSTRUMENTATION LAB

Any Five of the following

1. Simple fault finding of pH meters and Identification different type pH electrodes.
2. Displacement measurement using LVDT
3. Design of V-F and F-V converter
4. Instrumentation amplifier
5. Study of Strain gauges.
6. Thermocouple Compensation.
7. Thermistor Linearization transmitter design.
8. Pressure Calibration.
9. Signal conditioning circuit for any resistive / pressure transducer.
10. Signal conditioning circuit for optical encoder.

Any Five of the following using Lab View

1. Creating a simple VI to place a Digital Control
2. Navigation and Editing
3. VI to make a Degree C to Degree F Converter
4. Converting VI in to Sub VI
5. Write a programme to count Modulus 32 and display the values in decimal, octal decimal and Binary.
6. Built a VI using *while loop* that displays random numbers in to three wave form charts. (Strip, scope & Sweep)
7. Data Acquisition using Lab VIEW
8. Development of Temperature Measurement using Lab VIEW
9. Development of Virtual Instrument for Function Generator using Lab VIEW
10. Development of Virtual Instrument for Audio Signal Spectrum Analyser using Lab VIEW

GROUP C ELECTIVE: **SEM – I**

PAPER I: BASIC VLSI DESIGN

UNIT I: INTRODUCTION TO MOS TECHNOLOGY

Introduction to IC technology – the IC era – MOS and related VLSI technology – Basic MOS transistors – Enhancement mode transistor action – Depletion mode transistor action – nMOS fabrication – CMOS fabrication – Thermal aspects of processing – BiCMOS technology – production of E-beam masks.

UNIT II: MOS AND BI CMOS CIRCUIT DESIGN PROCESSES

MOS Layers – Stick diagrams – Design Rules and layout – General observations on the design rules – 2µm double metal, double poly – CMOS/ Bi CMOS rules – 1.2 µm single metal, single poly. CMOS rules – Layout diagrams – A brief introduction – Symbolic diagrams – Translation to mask form

UNIT III: BASIC CIRCUIT CONCEPTS

Sheet resistance concept applied to MOS transistor and invertors - Area capacitances of layers – Standard unit of capacitance Cg – Standard unit of capacitances calculation – The delay unit – inverter delays – Driving large capacitance loads – Propagation delay – Wiring capacitances.

UNIT IV: SCALING OF MOS CIRCUITS

Scaling models and scaling and scaling factors – Scaling factors for device parameter – Some discussion on and limitations of scaling

UNIT V: SUBSYSTEM DESIGN AND LAYOUT

Some architectural issues Switch logic – Gate (Restoring) Logic – Examples of structured design (Combinational logic) – Some Clocked sequential circuits – Other System considerations.

Text Book:

1. Douglas A. Punknell and Kamran Eshraghian , “Basic VLSI Design” Eastern Economy Edition, III Edition.

GROUP C ELECTIVE: **Sem –II**

PAPER II: ASIC DESIGN

UNIT I: INTRODUCTION TO ASIC

ASIC Design – Introduction- ASIC Examples- Advantages – Types- Full custom ASIC, Semi – Custom ASIC – Standard cell – Based ASIC – GATE Array – based ASIC, - Channels gate array- Structured gate array – Field –Programmable Gate array- Programmable logic devices structure –PALs –PLDs – Programming of PALs – EPROM and EEPROM Technology – Plalsm- Programmable interconnect - Programmable Gate array – ASIC design flow

UNIT II: PROGRAMMABLE ASICS, PROGRAMMABLE ASIC LOGIC CELLS AND PROGRAMMABLE ASIC I/O CELLS

Anti fuse- Static RAM- EPROM and EEPROM technology, PREP benchmarks- Actel ACT – Xillinx LCA – Altera FLEX – Design Systems- Logic synthesis – half gate ASIC schematic entry – Low level design language – PLA tools – ENDIF – CFI design representation.

UNIT III: II PROGRAMMABLE ASIC INTERCONNECT, PROGRAMMABLE ASIC DESIGN SOFTWARE AND LOW LEVEL DESIGN ENTRY

Actel ACT – Xillinx LCA – Xilinx EPLD – Altera MAX 5000 and 7000 –Altera MAX 9000 – Altera FLEX – Design systems – logic Synthesis – half gate ASIC Schematic entry – Low level design language – PLA Tools – ENDIF – CFI Design representation.

UNIT IV: ASIC CONSTRUCTION, FLOOR PLANNING, PLACEMENT AND ROUTING

System partition – FPGA partitioning – Partitioning methods – floor planning – placement – physical design flow – global routing – detailed routing – special routing – Circuit extraction – DRC

UNIT V: BASICS OF MICRO WIND

Introduction to micro wind – features – Analog cells – Design of resisters- Capacitors- MOS capacitor – inter – Metal capacitor-Diode – Connected MOS –Simulation layout- Voltage reference using PMOS and NMOS device- Voltage reference –Current mirror – Amplifier design – Micro wind mexus : File, View,Edit ,Simulator- Compile, Analysis,Palette,Navigator window

Text Books:

1. M.J.S. Smith ," Application – Specific integrated circuit" – Addison – Wesley Longman Inc.1997
2. Andrew Brown, -"VLSI circuits and systems in silicon" Cc Graw Hill,1991
3. S.D Brown, R.J.Francis, J.Rox , Z.G.Uransesic, " Field Programmable gate arrays" Khuever academic publisher, 1992
4. S.Y.Kung, H.J.Whilo House, T.Kailath, " VLSI and Modern Signal Processing" Prentice Hall, 1985

GROUP C ELECTIVE: **Sem –III**

PAPER III: VLSI DESIGN USING VERILOG

UNIT – I:

Basics: Synthesis – Design Process – Logic Value System – Verilog Constructs To Gates: Continuous Assignment Statement – Procedural Assignment Statement.

UNIT – II:

Always Statement – If Statement – Inferring Latches From If Statement – Case Statement: Casex – Casez – Inferring Latches From Cases Statement – Full Case – Parallel Case – Non Constant As Case Item Loop Statement – Functions – Tasks – Using Values X And Z – Value X And Value Z

UNIT – III:

Verilog Data Types – Nets – Register – Variables –Constants – Array Of Nets Or Registers –Verilog Operators – Arithmetic – Bitwise – Reduction –Logical –Relational –Shift Conditional – Concatenation – Expressions And Operands – Operator Precedence

UNIT – IV:

Additional Features of Verilog – Arrays of Primitives and Modules – Hierarchical Dereferencing – Parameters Substitution – Procedural Continuous – Intra Assignments – In Determinant Assignments and Race Condition – Wait Statements – Fork Join Statements – Named Events – Constructs Supported By Synthesis Tools

UNIT – V:

Modeling Examples – Modeling Combinational Logic – Modeling sequential logic – modeling a memory – writing Boolean equations – Modeling a counter – Modeling a parameterized adder – Modeling a parameterized comparator – Modeling a decoder – Modeling a multiplexer.

Text Books:

1. J.Bhasker, " VERILOG HDL SYNTHESIS, A PRACTICAL PRIMER" , BS Publication, I Indian Edition.
2. Micheal D. Ciletti, " ADVANCED DIGITAL DESIGN WITH THE VERILOG HDL " , PHI publications, Indian reprint.

GROUP C ELECTIVE: SEM - IV

PRACTICAL: VLSI SYSTEM DESIGN LAB

1. Synchronous counter
2. Asynchronous counter
3. Clock divider and generator
4. FIFO Design
5. Multiplexer design
6. Encoder
7. Decoder
8. Comparator
9. Latches and flip flops
10. ALU Design
11. Parity generator
12. UART Module
13. SPI module
14. Memory module
15. Sequence detector

(Nine out of twelve) of the 3rd semester lab programs, CBCS Scheme (VTU). data-structures. 7 commits.Â Want to be notified of new releases in gitshashwat/Data_Structures_Codes-CBCS-? Sign in Sign up. Launching GitHub Desktop Exam Mode: The examination will be held through online CBT mode. Drawing test for Jee Main Paper II (B.Arch) will be held through offline mode. Subjects: JEE Main will contain questions from Chemistry, Physics and Mathematics subjects. Type of Questions: Objective type -Multiple Choice questions and numeric type questions will be asked in the examination. Number of Questions: Question paper will contain 90 questions, in which candidates will have to attempt 75 questions. Choices will be given in section B. WBCS Exam Pattern â€“ West Bengal Civil Service (Executive) Examination Pattern and scheme of examination are given belowâ€¦.. Scheme of Examination: W.B.C.S. (Exe.) etc. Examination will be held in two successive stages, viz., (i) Preliminary Examination (Objective Type) and (ii) Main Examination (Both Objective and Conventional Type) and Personality Test.Â I. Scheme of the Preliminary Examination : The Preliminary Examination will consist of only one paper, viz., a paper on â€œGeneral Studiesâ€. The paper will be of an objective type consisting of 200 multiple-choice questions. The paper will carry 200 marks and will be of 2Â½ hours duration. Start display at page: Download "SCHEME OF EXAMINATIONS : CBCS Pattern". Error: Download Document.Â (Master of Library and Information Sciences) (For the University Department students admitted during the academic year & onwards) SCHEME OF EXAMINATIONS : CBCS Pattern CORE- ELECTIVE SUPPORTIVE Paper Code TITLES OF THE PAPER University Examinations I II III IV CORE-1 MLISC01 Foundations of Library and Information Science CORE-II MLISC02 Knowledge Organisation-I Classification Theory CORE-III MLISC03 Knowledge Organisation-II. NEET 2021 Exam Pattern: As per the decision taken by the Union Ministry of Health & Family Welfare, NEET 2021 will be conducted twice from this year. NTA will release the updated NEET 2021 Exam Pattern with information regarding the mode of exam, type of questions, etc very soon. According to the previous yearâ€™s NEET Exam Pattern, the paper will be comprised of 180 multiple choice questions divided among Physics, Chemistry, and Biology. Check Biology NEET Exam Pattern.Â A particular regional language can only be opted in the examination centers as prescribed in NEET notification. Take a look at the following table for this: - Language.