PANJAB UNIVERSITY, CHANDIGARH- 160014 (INDIA)

FACULTY OF ENGINEERING & TECHNOLOGY

SYLLABI

FOR

**Bachelor of Engineering (Electronics & Electrical Communication)
Third-Eight Semesters
Examinations,2010-2011**

SCHEME OF EXAMINATION FOR BACHELOR OF ENGINEERING(ELECTRONICS AND ELECTRICAL COMMUNICATION)

THIRD SEMESTER

Theory					Practical			
Theory Paper Code	Paper Title	Hours/ Week L+T	Marks Uni. Exam	Int. Ass.	Hours/ Week	Marks Uni. Exam	Int. Ass.	Practical Paper Code
EC-301	Semiconductor Electronics	3+0	100	50	3	25	50	EC-351
EC-302	Electromagnetic Theory	3+0	100	50	--	--	--	
EC-303	Filters & Transmission Lines	3+0	100	50	3	25	50	EC-353
EC-304	Digital Electronics	3+0	100	50	3	25	50	EC-354
AS-301	Engineering Maths-III	3+1	100	50	--	--	--	
EC-305	Object Oriented Programming	3+0	100	50	3	25	50	EC-355
	Workshop						50	WS-157
Grand Total: 1250		19	600	300	12	100	250	

SCHEME OF EXAMINATION FOR BACHELOR OF ENGINEERING(ELECTRONICS AND ELECTRICAL COMMUNICATION)

FOURTH SEMESTER

Theory					Practical			
Theory Paper Code	Paper Title	Hours/ Week L+T	Marks Uni. Exam	Int. Ass.	Hours/ Week	Marks Uni. Exam	Int. Ass.	Practical Paper Code
EC401	Communication Theory	3+0	100	50	---	----	----	------
EC402	Analog Electronics Circuits	3+0	100	50	3	50	50	EC-452
EC403	Microprocessors	3+0	100	50	3	50	50	EC-453
EC404	Communication Engineering	3+0	100	50	3	50	50	EC-454
EC405	Operating Systems	3+0	100	50	--	--	--	---
EC406	Data Structures & Algorithms	3+0	100	50	3	25	25	EC-456
Grand Total: 1250		18	600	300	12	175	175	

SCHEME OF EXAMINATION FOR BACHELOR OF ENGINEERING(ELECTRONICS AND ELECTRICAL COMMUNICATION)

FIFTH SEMESTER

	Theory				Practical			
Theory Paper Code	Paper Title	Hours / Week (L)	Marks Uni. Exam	Int. Ass.	Hours/ Week	Marks Uni. Exam	Int. Ass.	Practical Paper Code
EECE-501	Linear Control System	3	100	50	-	-	-	
EECE-502	Micro Electronics	3	100	50	3	25	25	EECE -552
EECE-503	Antenna & Wave Propagation	3	100	50	-	-	-	-
EECE-504	Advanced Microprocessor	3	100	50	3	25	25	EECE -554
EECE-505	Instrumentation	3	100	50	3	25	25	EECE -555
EECE-506	Numerical Analysis	3	100	50	-	-	-	-
	Software Lab	-	-	-	4	25	25	EECE -556
	Vocational training	-	-	-	-	-	150	EECE-557
Grand Total: 1250		18	600	300	13	100	250	-

SCHEME OF EXAMINATION FOR BACHELOR OF ENGINEERING(ELECTRONICS AND ELECTRICAL COMMUNICATION)

SIXTH SEMESTER

Theory					Practical			
Theory Paper Code	Paper Title	Hours/ Week L	Marks Uni. Exam	Int. Ass.	Hours/ Week	Marks Uni. Exam	Int. Ass.	Practical Paper Code
EECE-601	**System Design Electronics**	4	100	50	-	-	-	
EECE-602	**Microwave Engineering**	4	100	50	3	40	60	EECE -652
EECE-603	**Micro controller and Embedded Systems**	4	100	50	3	40	60	EECE -653
EECE-604	**VHDL Programming & Technology**	3	100	50	3	40	60	EECE -654
EECE-605	**Power Electronics**	4	100	50	3	40	60	EECE -655
EECE-606	**Human Resource Management**	3	50	50	-	-	-	-
Grand Total: 1250		22	550	300	12	160	240	

SEVENTH SEMESTER

Theory					Practical			
Theory Paper Code	Paper Title	Hours/ Week L	Marks Uni. Exam	Int. Ass.	Hours/ Week	Marks Uni. Exam	Int. Ass.	Practical Paper Code
EECE-701	Digital communication	4	100	50	3	75	50	EECE-751
EECE-702	Digital Signal Processing	4	100	50	3	75	50	EECE-752
EECE-703	Wireless and Mobile Communication	3	100	50	--	--	--	
EECE-704	Elective-1	3	100	50	--	--	--	
	Seminar-1	--	--	--	4	--	100	EECE-753
	Minor Project	--	--	--	6	100	100	EECE-754
	Vocational Training						100	EECE-755
Grand Total: 1250		14	400	200	16	250	400	

Elective-1
0pt any one from the following:

1. Neural network and Fuzzy Logic
2. Artificial Intelligence
3. Web Technologies
4. Radar Engineering

SCHEME OF EXAMINATION FOR BACHELOR OF ENGINEERING(ELECTRONICS AND ELECTRICAL COMMUNICATION)

EIGHTH SEMESTER

	Theory				Practical			
Theory Paper Code	Paper Title	Hours/ Week L	Marks Uni. Exam	Int. Ass.	Hours/ Week	Marks Uni. Exam	Int. Ass.	Practical Paper Code
EECE-801	Optical Fiber Communication	3	100	50	3	25	50	EECE-851
EECE-802	Computer Network	3	100	50	3	25	50	EECE-852
EECE-803	Elective-II*	3	100	50	--	--	--	--
EECE-804	Computer Architecture	3	100	50	--	--	--	--
EECE-805	VLSI Design	3	100	50	--	--	--	--
	Major project	--	--	--	6	100	100	EECE-854
	Seminar-2	--	--	--	4	--	100	EECE-855
EECE-800	General Fitness	--	--	--		0	50	
Grand Total: 1250		15	500	250	16	150	350	

Elective-II*
1. Digital Image Processing
2. Satellite Communication
3. Nano-Technology

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SYLLABUS FOR
BACHELOR OF ENGINEERING (ELECTRONICS AND ELECTRICAL COMMUNICATION)
THIRD SEMESTER

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Paper Title:- Semiconductor Electronics (Theory)

Paper Code: EC 301   Max. Marks: 100   Time: 3 hours

Course duration: 45 lecturers of one hour duration each

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

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PART A

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 Transistor characteristics :   [10]
  Junction transistor, transistor current components, current gain, transistor as an
 amplifier, common emitter, common base, common collector configurations, Input &output characteristics   in
CE,CB & CC configurations, photo transistor & its   characteristics, unijunction transistor &its characteristics.

 Transistor at low frequencies: [08]
   Graphical analysis of CE configuration two port devices and hybrid model, h-parameters,
   comparison of amplifier configurations. of circuits

Transistor biasing and Thermal stabilization :   [08]
   Concept of biasing &biasing of BJT circuits, Operating point, bias stability, stabilization
   against variation in Ico, Vbe, and β, thermal run away, thermal stability.

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PART B

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Field Effect transistor :   [09]
   Junction field effect transistor , JFET characteristics, pinch off voltage and equivalent
   circuit , MOSFETS their modes of operation and characteristics, equivalent circuit , biasing of FETS.

Power amplifiers :   [10]
   Classification of amplifiers, Class A large signal amplifier, second and higher
   harmonicdistortion, transformer coupled amplifiers, Efficiency of amplifiers, Push
   pul lamplifiers (class A & class B).

BOOKS RECOMMENDED :

1. Integrated Electronics, Millman & Halkias (Mc-Graw Hill)

2. Microelectronics Circuits, AS Sedra & KC Smith (OXFORD)

3. Electronics Devices & Circuit Theory, RL Boylestead & L Nashelsky (PHI)

4. Electronic Circuit Analysis & Design, Donald A. Neamen (TMH)

Paper Title: - SEMICONDUCTORS ELECTRONICS (PRACTICAL)

Paper Code: EC-351   Max. Marks: 25

Note: At least eight experiments are to be done.

List of Experiments

1. To study the specification sheet & draw the characteristics of transistor in CB or CE configuration.
2. To study the specification sheet & draw the characteristics of FET in CD or CC configuration.
3. To draw the frequency response of a single stage BJT amplifier.
4. To measure the voltage and current gain of a BJT amplifier.
5. To measure the distortion in the output of a push pull amplifier.

To simulate the following using P-spice

1. Frequency Response of a single state FET amplifier.
2. Voltage and current gain of BJT amplifier.
3. Distortion of a push pull power amplifier.

Paper Title: - ELECTROMAGNETIC THEORY (THEORY)

Paper Code: EC 302   Max. Marks: 100   Time: 3 hours

Course duration: 45 lecturers of one hour duration each
Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

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PART A

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Maxwell's equation:
Maxwell's equations in their integral and differential forms, Maxwell's equations in free space and in harmonically varying fields. Physical Interpretation and Boundary Conditions   [8]

Plane waves in Dielectric and Conducting Media:
Conductors and Dielectrics, Wave equations in conducting and dielectric media its solution, Skin effect, relaxation time, impedance of the conducting medium. Reflection and transmission of the wave at a boundary. Poynting Vector: application to energy Radiation, Velocities of propagation: group velocity, phase velocity, wave polarization.   [16]

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PART B

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Guided Waves:
Waves between parallel planes, TEM waves, Field analysis of T.M. & T.E. wave, Characteristics of T.M. & T.E. Waves**.**   [9]

Wave Guides:
Rectangular and Circular waveguides:T.M. & T.E. Modes ,Wave impedance and characteristics impedances, Attenuation factor and Q of waveguides. [12]

BOOKS RECOMMENDED:

1. Electromagnetic Waves & Radiation System by E.C. Jordan & K. G. Balmain, Prentice Hall India, Edition Latest

2. Electromagnetic by Krauss, Mc Graw Hill, Edition 5TH .

3. Antennas and Wave Propagation by G S N Raju, Pearson publications, Edition 1ST

4. Antennas and Radio Wave Propagation by K D Prasad Satya Prakashan, Edition Latest

5. Antenna and Radio Wave Propagation ,Collin R.E., Mc-Graw Hill, Edition Latest

Paper Title: - FILTERS AND TRANSMISSION LINES (THEORY)

Paper Code: EC -303   Max. Marks: 100   Time: 3 hours

Course duration: 45 lecturers of one hour duration each
Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART A

Impedance Functions and Networks functions:
Concept of complex frequency, Transform Impedance and transform circuits, Network functions for the one port and twp port, Calculation of network functions, poles and Zeros for Network functions, Restrictions on Poles and Zeros Locations for Driving Point and Transfer functions, Time domain behavior from Pole and Zero plot, Stability of Active networks [09]

Filter Synthesis:
Classification of filters, Characteristics, impedance (input & characteristic) and propagation constant of pure reactive network, Ladder Network, T-section, pie section, Pass and stop bands, Constant –K low pass and high pass filters, m-derived T and pie section, Design of k and m-derived filters, Band pass filters, band elimination filters, Composite filters. [12]
PART B

Two port Parameters:
 Relationship of Two port variables, Short Circuit Admittance and Open circuit Impedance parameters, Transmission and hybrid parameters. [06]

Sinusoidal Steady State Analysis:
 Network Synthesis for two terminal network, Foster and Cauer forms. [03]

Transmission Lines:
Line parameters, Inductance and capacitance of a line of two parallel conductors, inductance of coaxial line, Line of Cascaded T-section, Transmission line-general solution, Physical significance of the equations,; the infinite line, wavelength, velocity of propagation, waveform distortion, distortionless line, telephone cable, Reflection on a line not terminated in Z_0 , Reflection constant, Line calculation, Input and transfer impedance, open and short circuited lines, Reflection factor and reflection loss, parameters of open wire line and coaxial line at high frequencies, constants for the line of zero dissipation, Voltage and currents on dissipationless line, standing wave nodes, standing wave ratio.Input impedance of dissipationless line,power loss in unmatched lines, single stub matching and smithchart.   [15]

BOOKS RECOMMENDED:

1. Circuits and Networks (Analysis and Synthesis) by A. Sudhakar & S.P. Shyammohan, Tata McGraw Hill 1994, Edition 2ND

2. Circuit Analysis by Allan D. Krauss, West Publishing Company, Edition Latest

3. Networks, Lines and Fields by John D. Ryder, PHI, Edition 2ND

4. Engineering Circuit Analysis by Milliam H.Hayt.Jack E.Kemmerly Third edition, Edition 6TH

5. A Course in Electrical Circuits Analysis by Soni-Gupta, Dhanpat Rai & Sons, Edition Latest.

6. Theory and Problems of Electric Circuits by Joseph A. Edminister, Second edition, Tata McGraw Hill, 1991, Edition 2ND.

7. Network Analysis by M.E. Van Valkenburg (PHI), Edtion $3+0^{RD}$.

8. Circuit Analysis by Allan D. Krauss (West Publishing Company), Edition Latest

Paper Title: - FILTERS AND TRANSMISSION LINES (PRACTICAL)

Paper Code: EC-353   Max. Marks: 25

Note: At least eight experiments are to be done

List of Experiments

1. To Design & implement a constant K low pass / high pass filter.
2. To Design & implement a band pass filter.
3. To Design & implement a m-derived low pass / high pass filter
4. To Design & implement a composite low pass/ high pass filter.
5. To Measure the characteristics and attenuation of a Transmission line.
6. To Measure the input impedance of a Transmission line.
7. To Measure phase displacement between the current and voltage at input of Transmission line.
8. To Study the Frequency characteristics and stationary waves of a Transmission line.
9. To Measure Signal Phase shift along the line.
10. Fault localization within the line.

Paper Title: - DIGITAL ELECTRONICS (THEORY)

Paper Code: EC 304   Max. Marks: 100   Time: 3 hours

Course duration: 45 lecturers of one hour duration each
Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

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PART A
Introduction
Concept of digitisation, Representation of Logic, Logic Variables, Boolean Algebra, Boolean Expressions and minimization of Boolean expression using K-Map(up to five variables), Review of Logic Gates, design & Implementation of Adder, Subtractor, Multiplexer, DeMultiplexer, Encoder, Decoder, ROM, Digital Comparators, Code Converters using gate, multiplexers / decoders   [10]

Flip-Flops
A 1- bit memory cell, clocked & unclocked flip flop, S-R Flip-Flop, JK Flip-Flop, Race around Condition , Master Slave Flip-Flop, D&T type Flip-Flop   [04]

Counters & Shift Registers
Ripple Counters, Design of Modulo-N ripple counter ,Presettable Counters, Up-Down counter, design of synchronous counters with and without lockout conditions, design of shift registers with shift-left, shift-right & parallel load facilities, Universal shift Registers   [10]

PART B
Data Converters
Sample & Hold switch, D/A converters: weighted resistor type, R-2R Ladder type; A/D Converters: Counter-Ramp type, Dual Slope Type, Successive approximation type, flash type; Specifications of ADC & DAC   [06]

Digital Logic families

Characteristics of digital circuits: fan in, fan-out, power dissipation, propagation delay, noise margin; Transistor-transistor Logic(TTL), manufacturer Data Sheets & Specifications, Types of TTL Gates (Schottky, standard, low power, high speed). Emitter Coupled Logic(ECL), Manufacturers Data sheets & Specifications, Comparison of Characteristics of TTL and ECL, Tristate Logic & its applications. [5]

Semiconductor Memories & Programmable Logic   [10]
ROM, PROM, EPROM, EEPROM; RAM: Static RAM, Typical Memory Cell, Memory Organisation, Dynamic RAM cell, Reading, & Writing Operation in RAM, PLA, PAL & FPGA

BOOKS RECOMMENDED:

1. Digital Electronics by **Taub Schilling**

2. Integrated Electronics by **Millman & Halkias**

3. Digital System Principles & Applications by **R J Tocci** (PHI)

4. Digital Logic Design By **Morris Mano**

Paper Title: - DIGITAL ELECTRONICS (PRACTICAL)

Paper Code: EC-354   Max. Marks : 25

Note: At least eight experiments are to be done.

List of Experiments

1. To Study the data sheets of TTL and ECL gates
2. Verify the truth tables of with various gates, RS, D, JK Flip Flops
3. To design and implement a Modulo-N Counter
4. To Design and implement a Universal shift register
5. To perform arithmetic & Logic operations on two 4-bit binary numbers using an ALU.
6. To Transfer the Data between Three Registers through Tristate Circuit
7. To Understand Decoder/Driver and their applications with display. To display a count from 00 to 99 with a delay of N seconds.
8. Design & fabrication of synchronous counter
9. Design & fabrication of Combinational circuits using Multiplexers
10. To convert 8 bit Digital data to Analog value using DAC
11. To convert Analog value into 8 bit Digital data using ADC

Paper Title: Engineering Mathematics – III

Paper Code: AS301   Maximum Marks: 100   Time: 3hours.

Course duration: 45 lecturers of one hour duration each
Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

Part - A
Sequences and Series: (08)
Sequences, Limits of sequences, Infinite series, series of positive terms, Integral test, Comparison test, Ratio test, Root test. Alternating series, Absolute and Conditional Convergence, Leibnitz test. Power series: radius of convergence of power series, Taylor's and Maclaurin's Series, Formulae for remainder term in Taylor and Maclaurin series, Error estimates. (Scope as in Chapter 8, Sections 8.1 – 8.10 of Reference 2).

Linear Algebra: (07)
Concept of linear independence and dependence, Rank of a matrix: Row – Echelon form, System of linear equations: Condition for consistency of system of linear equations, Solution by Gauss elimination method. Inverse of a matrix: Gauss – Jordan elimination method (Scope as in Chapter 6, Sections 6.3 – 6.5, 6.7 of Reference 1).
Eigen values, eigen vectors, Cayley – Hamilton theorem (statement only). Similarity of matrices, Basis of eigenvectors, diagonalization (Scope as in Chapter 7, Sections 7.1, 7.5 of Reference 1).

Part - B
Complex Functions: (08)
Definition of a Complex Function, Concept of continuity and differentiability of a complex function, Cauchy – Riemann equations, necessary and sufficient conditions for differentiability (Statement only). Study of complex functions: Exponential function, Trigonometric functions, Hyperbolic functions, real and imaginary part of trigonometric and hyperbolic functions, Logarithmic functions of a complex variable, complex exponents (Scope as in Chapter 12, Sections 12.3 – 12.4, 12.6 – 12.8 of Reference 1).

Laurent Series of function of complex variable, Singularities and Zeros, Residues at simple poles and Residue at a pole of any order, Residue Theorem (Statement only) and its simple applications (Scope as in Chapter 15, Sections 15.1 – 15.3 of Reference 1).

(07)

Conformal Mappings, Linear Fractional Transformations (Scope as in Chapter 12, Sections 12.5, 12.9 of Reference 1). (08)

BOOKS RECOMMENDED:

1. E. Kreyszig. Advanced Engineering Mathematics, Eighth Edition, John Wiley.

2. G. B. Thomas, R. L. Finney: Calculus, Ninth Edition, Pearson Education.

3. Michael D. Greenberg. Advanced Engineering Mathematics, Second Edition, Pearson Education.

4. R. V. Churchill, J. W. Brown. Complex Variables and Applications, Sixth Edition, McGraw-Hill, Singapore, 1996.

5. Vivek Sahai, Vikas Bist. Linear Algebra, Narosa Publishing House, New Delhi, 2002.

Paper Title:- OBJECT ORIENTED PROGRAMMING (THEORY)

Paper Code: EC 305   Max. Marks: 100   Time: 3 hours

Course duration: 45 lecturers of one hour duration each
Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART A

Principles Of Objected Oriented Programming
 Advantages of OOP, comparison of OOP with Procedural Paradigm   [3]

C++ Constructs
 Tokens, Expressions and control structures, various data types, and data structures, Variable declarations, Dynamic Initializations, Operators and Scope of Operators, Typecasting, Unformatted and formatted console I/O Operations **[3]**

Functions
Classes and Objects: Prototyping, Referencing the variables in functions, Inline, static and friend functions. Memory allocation for classes and objects. Arrays of objects, pointers to member functio   [5]

Constructors And Destructors
 Characteristics and its various types, Dynamic Constructors, Applications, Order of Invocation, C++ garbage collection, dynamic memory allocation.   [5]

Polymorphism

Using function and Operator overloading, overloading using friend Functions, type conversions from basic data types to user defined and vice versa. [5]

PART B

Inheritance [6]

Derived classes, types of inheritance, various types of classes, Invocation of Constructors and Destructors in Inheritance, aggregation, composition, classification hierarchies, metaclass/abstract classes.

Pointers

constant pointers, Use of this Pointer, Pointer to derived and base classes, virtual functions, Bindings, Pure virtual Functions and polymorphism [**5**]

I/O Operations And Files

Classes for files, Operations on a file, file pointers [4]

Generic Programming With Templates [6]

Definition of class template, Function Templates, Overloading Template Functions, Class templates and member functions templates with parameters, Standard C++ classes, persistent objects, streams and files, namespaces, exception handling, generic classes, standard template library: Library organization and containers, standard containers, algorithm and Function objects, iterators and allocators, strings, streams, manipulators, user defined manipulators and vectors

Introduction

Object Oriented System, Analysis and Design [3]

BOOKS RECOMMENDED:

1. Object Oriented Programming with C++ By Bala Guruswamy, TMH, Edition 3rd

2. C++ Primer Plus By Prata, Pearson Education, Edition 1st

3. The C++ Programming Language By Bjarne Stroutstrup, Edition 3rd

4. Object Oriented Programming with Ansi and Turbo C++,Kamthane, Pearson Education, Edition 1st

5. The Complete Reference to c++ By Schildt, TMH, Edition 4th

6. OOPs Using C++   By Sanjeev Sofat, Khanna Publishions, Edition Latest

Paper Title: - OBJECT ORIENTED PROGRAMMING (PRACTICAL)

Paper Code: EC 355   **Max. Marks: 25**

Note: At least eight experiments are to be done

List of Experiments

1. Implementation of Functions, Classes and Objects
2. Constructors and Destructors
3. Operator Overloading and Type Conversion
4. Inheritance and Virtual Functions
5. Files
6. Exception Handling and Generic Programming.
7. More experiments related to theory course.

BACHELOR OF ENGINEERING (ELECTRONICS AND ELECTRICAL COMMUNICATION)

FOURTH SEMESTER

Paper Title: - COMMUNICATION THEORY

Paper Code: EC 401   Max. Marks: 100   Time: 3 hours

Course duration: 45 lecturers of one hour duration each.

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART A

Signal & its Representations
Review of Fourier series & Fourier transform, Continuous Spectra, Delta Function, power & energy spectral densities, Sampling Theorem- approximations   [6]

Random Signal Theory
Sample space, random variables-discrete & Continuous, examples of probability Density Functions-Moments, joint & conditional PDF density functions of sums, Transformation, concept of correlation, auto & Cross-correlation functions, white Noise.   [8]

Transmission of Signals through Networks
Convolution Theorem, graphical interpretation of Low pass High Pass & Band Pass networks, Optimum Filters-Matched filters, input/output relations with random inputs, Envelope Detector-Rician & Rayleigh distribution. Equivalent Noise bandwidth.   [10]

PART B

Noise & Interference
Classification of Noise, Sources of noises, atmospheric shots, Thermal noise, noise in Semiconductors, Noise spectral density, Noise calculations, Noise Figures of devices & circuits, cascaded networks, Minimum noise, Figures of networks. Experimental determination of Noise Factor

[07]

Basic Information Theory
Concept Information, Entropies of Discrete Systems, Rate of transmission- Redundancy, Efficiency & Channel capacity, Source encoding including Huffman's Technique, continuous Channel- Entropy maximization, Transmission rate of Channels, capacity of Noisy channels. Discussion of Shannon's coding theorem, Comparison of Analog & Digital Communication Systems with reference to the Ideal Channel Capacity Theorem.

[14]

BOOKS RECOMMENDED:

1. Communication Systems by B P Lathi Pub:Willey Eastern Limited, Edition 3+0rd

2. Introduction to Modern Communication by P D Sharma, Edition Latest

3. Introduction to Information Theory by F M Reza, Edition Latest

4. Communication Systems by Haykin Pub:Willey Eastern Limited, Edition Latest

Paper Title:- ANALOG ELECTRONIC CIRCUITS (THEORY)

Paper Code: EC 402   Max. Marks: 100   Time: 3 hours

Course duration: 45 lecturers of one hour duration each
Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART A

Response of transistor Amplifier
Review Biasing, classification of amplifier , distortion in amplifiers , frequency & phase response of an amplifier, RC coupled amplifier , its low and high frequency responses, transistor model at high frequencies for CE and Emitter follower configuration, high frequency response of two cascaded CE transistor stages   [9]

Feedback and Stability   [8]
Introduction to feedback, Basic-Feedback Concepts, Ideal Feedback Topologies,
Voltage(Series-Shunt) Amplifiers, Current(Series-Shunt) Amplifiers,
Transconductance(Series-Series) Amplifiers, Transresistance(Shunt-Shunt) Amplifiers,

Operational Amplifier   [10]
Differential Amplifier, Block diagram representation of a typical Op-amp, Interpreting of a typical set of data sheets, ideal op-amp, equivalent circuit. of op-amp, ideal voltage transfer curve, open loop op-amp configuration, the practical op-amp, input offset voltage, input bias current, input offset current, total output offset voltage, thermal drift, noise, common mode configuration, CMRR,. Frequency Response, Frequency response of internally compensated Op-Amps, Frequency response of Non-compensated OP-Amps, Open loop voltage gain as a function of frequency, Closed loop frequency response, Slew rate

PART B

Op-amp Applications
DC and AC Amplifiers, summing, Voltage–to-current converter, current to voltage converter, the Integrator, the Differentiator, Comparator, Zero-crossing detector, Voltage to frequency and frequency to voltage converters, Clippers and Clampers, Sample and Hold Circuit, Instrumentation Amplifier.

                                                                                [10]

Active Filter ,Oscillators & Tuned Amplifiers
Active filters, Essentials of Oscillator, Types of Oscillator, Sinusoidal Oscillator, Schmitt Trigger Circuits, Introduction of Tuned Amplifiers, Single & Double Tuned Amplifiers   [10]

BOOKS RECOMMENDED:

1. Electronics Circuit Analysis and Design by Donald A. Neamen, Tata McGraw Hill

2. Op-Amps and Liner integrated Circuits by Ramakant A. Gayakward, 4th edition, Pearson Education Asia Low price Edition

3. Integrated electronics by Millman & Halkias

Paper Title:- ANALOG ELECTRONICS CIRCUITS (PRACTICAL)

Paper Code: EC 452   Max. Marks: 50

Note: At least eight experiments are to be done.

List of Experiments

1. To study the Pspice Simulation software
2. Design fabrication & testing of Differentiator Circuits using Op-Amp & simulate using P-spice
3. Design fabrication & testing of Integrator Circuits using Op-Amp & simulate using P-spice
4. Design fabrication & testing of adder/Subtractor Circuits using Op-Amp & simulate using P-spice
5. Design fabrication & testing of Clippers and Clampers Circuits using Op-Amp & simulate using P-spice
6. Design fabrication & testing of Universal Active filter & simulate using P-spice
7. To study the frequency response of OP-Amp & simulate using P-spice
8. To design Butter worth Low pass filter & simulate using P-spice
9. To design Butter worth High pass filter & simulate using P-spice
10. To design Butter worth Band pass filter & simulate using P-spice
11. To design Monostable & Free running Multivibrator using 555

Paper Title:- MICROPROCESSOR (THEORY)

Paper Code: EC 403   Max. Marks: 100   Time: 3 hours

Course duration: 45 lecturers of one hour duration each
Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART A

Microprocessor Architecture and Microcomputer Systems;
Microprocessor Architecture Memory, Input and Output Devices, The 8085 MPU, Example
of an 8085-Based Microcomputer, Memory Interfacing, The SDK-85 Memory System.   [4]

Interfacing I/O Devices:
Basic Interfacing Concepts, Interfacing Output Displays, Interfacing Input Devices,
Memory- Mapped I/O, Testing and Troubleshooting, I/O Interfacing Circuits.   [6]

Programming the 8085:
Introduction to 8085 Assembly Language Programming, The 8085 Programming Model, Instruction Classification, Instruction Format. Data Transfer (Copy) Operations, Arithmetic Operations, Logic Operations, Branch Operations, Writing Assembly Language Programs.   [8]

Programming Techniques with Additional Instructions :

Programming Techniques Looping, Counting and Indexing, Additional Data Transfer and
16-Bit Arithmetic Instructions, Arithmetic Operations Related to Memory, Logic
Operations.   [5]

PART B

Counters and Time Delays:
Counters and Time Delays, Hexadecimal Counter, Modulo Ten, Counter, Generating Pulse
Waveforms, Debugging Counter and Time-Delay Programs.   [4]

Stack and Subroutines: Stack, Subroutine, Conditional Call and Return Instructions.   [3]

Interrupts : The 8085 Interrupt, 8085 Vectored interrupts.   [3]

Interfacing Data Converters:
Digital- to- Analog (D/A) Converters, Analog- to-   Digital (A/D) Converters.   [4]

General –Purpose Programmable Peripheral Devices:
The 8255A Programmable Peripheral Interface, Illustration: Interfacing Keyboard and Seven-
Segment Display, Illustration : Bi- directional Data Transfer between Two Microcomputers,
The 8254 Programmable Interval Timer, The 8259 A Programmable Interrupt Controller,
Direct Memory Access (DMA) and the 8257 DMA Controller, serial communication,
Programmable communications interface 8251.   [8]

BOOKS RECOMMENDED:

1. Ramesh S.Gaonkar, "Microprocessor Architecture, Programming and Applications with the 8085", Penram
    International, Edition 3+0rd .

2. Badri Ram., "Advanced Microprocessors & Interfacing" , Tata MC Graw Hill, Edition 1st

3. Charles M.Gilmore, "Microprocessor Principles and Applications", TMH Edition 1997. Edition 2nd

4. Douglas V. Hall , "Microprocessors and Interfacing programming and Hardware, Edition 2nd

Paper Title:- MICROPROCESSOR (PRACTICAL)

Paper Code: EC 453   Max. Marks: 50

Note: At least eight experiments are to be done.

List of Experiments

1. Familiarization of 8085 kits.
2. Verification of arithmetic and logic operations using above kits.(At least 5 programs)
3. Development of interfacing circuits of various control applications based on 8085.
4. Application of assembly language using 8085 instructions set to develop various programs.
5. Applications of data movement instructions to develop relevant programs.
More experiments related to theory coarse.

Paper Title:- COMMUNICATION ENGINEERING (Theory)

Paper Code: EC 404   Max. Marks: 100   Time: 3 hours

Course duration: 45 lecturers of one hour duration each
Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART A

Amplitude Modulation & Demodulation and Systems
Concept of Modulation its merits & demerits, Principle and generation of AM, DSB/SC, SSB signal collector and base Modulated class C amplifier, Balanced modulator, AM transmitter, Radio noise in AM systems, Detection of AM, DSB/SC, and SSB signals, Super heterodyne and communication Radio Receivers, SSB receiver, Diversity reception.   [15]

Frequency Modulation
Principles and generation of FM and PM signals, Reactance Modulator met6hod, Armstrong Method, noise consideration in FM and PM system,   [7]

PART B

Frequency Demodulation and FM Systems
Detection of FM and PM signals, Foster Discriminator, ratio and PLL detectors, FM Transmitter (Block Diagram), FM receiver (Block Diagram), Pre-emphasis and de-emphasis circuit.
                          [8]

Pulse Modulation & Demodulation
Principles, generation and detection of PAM, PWM, PPM & PCM signals, noise in pulse modulation system, band width consideration, companding, delta modulation ,adaptive delta modulation systems. TDM & FDM

                          [15]

BOOKS RECOMMENDED:

1. Electronic Principles by Dennis Raddy & John Coolin,Pub:PHI, Edition Latest

2. Electronic Communication Systems by G. Kennedy ,Pub: Mc Graw Hill, Edition 4th

3. Principles of Communication Systems by Taub and Schilling, Edition 2nd

Paper Title:- COMMUNICATION ENGINEERING (PRACTICAL)

Paper Code: EC 454   Max. Marks: 50

Note: At least eight experiments are to be done.

List of experiments

1. To measure the modulation index of AM signals using the trapezoidal method
2. To study DSB/ SC AM signal and its demodulation using product Detector Circuit.
3. To study the voltages and waveforms of various stages of super-heterodyne receiver
4. To measure the sensitivity and selectivity of a super heterodyne radio receiver
5. To study the voltages and waveforms of various stages of FM Receiver
6. To study the pulse code modulation and de-modulation circuit
7. To study the Time division multiplexing and demultiplexing circuit
8. To study delta modulation and demodulation circuits.
9. To study sigma delta modulation and demodulation circuits.

Paper title: OPERATING SYSTEMS

Paper Code: EC405   Max. Marks: 100   Time: 3 hours

Course duration: 45 lecturers of one hour duration each
Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

<div align="center">PART A</div>

Basic Functions and Concepts of Operating Systems: [5]
Concept of an operating systems, batch system, Multi-programmed, Time sharing, Personal Computer System, Parallel system, Real time system, General system Architecture.

Features and Objectives of Operating Systems: [11]
Systemcomponents, operating system services, System calls, System Programs, System Structure, System design and implementation. Concept of process, process states, process state transition, process control block, operations of processes, concurrent processes, deadlocks, scheduling algorithms, scheduling criteria, Process Synchronization.

Memory Management: [6]
Logical and physical address space, storage allocation and management techniques, swapping, concepts of multi programming, paging, segmentation, virtual storage management strategies, Demand Paging, Page Replacement Algorithms, Thrashing.

<div align="center">PART B</div>

Information Management: [6]
File concept, Access method, Directory structure, Protection File system structure, Allocation methods, Free space management, Directory implementation, Disk structure, Disk Scheduling, Disk management, Swap space management.

Distributed-System Structures: [6]
Network operating system, Distributed operating systems, Remote services, Robustness, Design Issues.

Distributed file systems and Distributed Coordination: [6]
Naming and Transparency, Remote file Access, Stateful versus stateless service, File replication, Event ordering, Mutual Exclusion, Atomicity, Concurrency control, Deadlock Handling, Election Algorithms, Reaching Agreement.

Case Studies: [5]

Unix O.S. Architecture, Operating system services, user perspective, representation of files in Unix system processes and their structure, Input-output system, Memory management, Unix shell, history and evolution of Unix system.

BOOKS RECOMMENDED:

1. Operating Systems by Galvin & Silberschatz Addison Wesley Publishing Ltd. Edi 5th .

REFERENCE BOOKS

1. An Introduction to Operating System by Harvey M. Deitel , Narosa Publishing House, Latest Edition.

2. Operating Systems: Design and implementation by Andrew S. Tanenbaum, PHI, Edi 2nd .

3. Operating system, by Millan Milankovic, McGraw Hill, Edi 2nd.

Paper Title:- DATA STRUCTURES AND ALGORITHMS (THEORY)

Paper Code: EC 406   Max. Marks: 100   Time: 3 hours

Course duration: 45 lecturers of one hour duration each
Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

<div align="center">

PART A

</div>

Introduction: Introduction to data structures; Introduction to Algorithms Complexity;   [1]

Arrays, Stacks & Queues: Concepts; Basic operations & their algorithms: Transverse, Insert, Delete, Sorting of data in these data structures; Prefix, Infix, Postfix Notations;   [8]

Lists: Concepts of Link List and their representation; Two way lists; Circular link list; Basic operations & their algorithms: Transverse, Insert, Delete, Searching and Sorting of data in List; Storage Allocation & Garbage Collection; Linked stack and queues; Generalized List; sparse matrix representation using generalized list structure;
          [10]

<div align="center">

PART B

</div>

Trees:
Binary Trees and their representation using arrays and linked lists; Trees and their applications; Binary tree transversal; Inserting, deleting and searching in binary trees; Heap & Heap Sort; General Trees; Thread binary tree; Height balance Tree (AVL); B-Tree;   [08]

Graphs and their applications:
Graphs; Linked Representation of Graphs; Graph Traversal and spanning forests; Depth first search; Breadth first search;   [08]

Sorting & Searching:

Insertion sort; Selection sort; Merging; Merge sort; Radix sort; Sequential & Binary Search; Indexed Search; Hashing schemes; Binary search Tree; [10]

BOOKS RECOMMENDED:

1. Data Structure Using C and C++ by A. Tenenbaum, Y. Langsam, M. J. Augenstein (PHI),Edition 2nd

2. Theory and problems of Data Structures Seymour Lipschutz (McGraw Hill), Edition 1st

3. Data Structures & Program Design Robert L. Kruse (PHI) , Edition 3rd

Paper Title:- DATA STRUCTURES AND ALGORITHMS (PRACTICAL)

Paper Code: EC 456   Max. Marks: 25

Note: At least eight experiments are to be done.

List of experiments

1. *Implementation of array operations:* Traversal, Insertion & Deletion at and from a given location; Sparse Matrices: Multiplication, addition.
2. *Stacks***:** Implementation of Push, Pop; Conversion of Infix expression to Postfix, Evaluation of Postfix expressions.
3. *Queues:* Adding, deleting Elements; Circular Queue: Adding & deleting elements.
4. *Implementation of linked lists:* inserting, deleting, and inverting a linked list. Implementation of stacks & queues using linked lists; Polynomial addition, Polynomial multiplication.
5. *Trees:* Implementation of Binary & Binary Search Trees, Recursive and Non-recursive traversal of Trees.
6. *Graphs:* BFS & DFS.
7. Implementation of sorting and searching algorithms
8. *Hash tables implementation:* searching, inserting and deleting, searching & sorting techniques

FIFTH SEMESTER

Paper Title: - LINEAR CONTROL SYSTEM

Paper Code: EECE- 501   Max. Marks: 100   Time: 3 hours

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part**

PART - A

1. Introduction   [04]

Concepts Plant, Systems Servomechanism, regulating systems, disturbances,
Open loop control system, closed loop systems, linear and non-linear systems, time variant &Invariant, continuous and sampled data control systems, Block diagrams, some illustrative examples.

2. **Modelling**   [08]

 Formulation of equation of Linear electrical, mechanical, thermal Pneugmatic and
hydraulic system, electrical, Mechanical analogies. Uses of Laplace transform, Transfer function, concepts of state variable modelling. Block diagram representation signal flow graphs and   associated algebra, characteristics equation.

3**. Time Domain Analysis**   [04]

 Typical test - input signal, Transient response of the first and second order systems. Time domain specifications, Dominant closed loop poles of higher order systems. Steady state error and coefficients.

4.**Stability** :   [06]

 Concept of absolute and relative stability, Pole-zero location and stability. Routh-Hurwitz Criterion

.

PART – B

5. Root Locus Technique: [05]

The extreme points of the root loci for positive gain. Asympotes to the loci, breakway points, intersection with

imaginary axis, location of roots with given gain & sketch of the root locus plot

6 Frequency Domain Analysis: [10]

Closed loop frequency response, bodeplots, stability and loop transfer function. Frequency response specification relative stability, relation between time and frequency response for second order systems. A and N-circles, Log. Magnitude versus phases angle plot. Plot Nyquist criterion.

7. Compensation: [04]

Necessity of compensation series and parallel compensations, Compensating network, application of lag and lead compensation.

8. Control Components: [04]

 Error detectors- potentiometers and synchronous, servo motor A.C. and D.C. techno generators, Magnetic amplifiers.

BOOKS RECOMMENDED

1. Modern Control Engg. by K. Ogata, Prentice Hall, New Delhi

2. Control System Components by J.F. Gibsen, Mcgraw Hill, .

3. Automatic Control System by B.C. Kuo, Prentice Hall, 3rd Ed.

4.Control System Engineering by I.J. Nagrath & Gopal, Wiley Eastern Ltd., New

Paper Title: - MICRO ELECTRONICS (THEORY)

Paper Code: EC- 502   Max. Marks: 100   Time: 3 hours

Course duration: 45 lecturers of one hour duration each

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part**

PART - A

Introduction: [04]
General classification of Integrated circuits, advantages of IC's over Discrete Components, Computer Generations.

Thick Film and Thin Film Hybrid ICs: [09]

Features of Hybrid IC technology, Thick film technology, Thick film processing.Thick film substrates, Thick film design, guidelines and applications of thick film hybrids. Thin film technology, thin film processing, thin film design, guidelines, advantages and applications of thin film hybrids.

Monolithic IC Processes: [14]
Refining and growth of silicon crystals, Silicon-Wafer preparation, Diffusion of dopant Impurities, Defication system. Ion implantation Thermal oxidation. Photolithography. Fine Line Lithography, Relative Plasma etching, Chemical Vapour deposition (CVD) Silicon on insulators, Metallization
.
PART - B
Monolithic Components: [14]
Epitaxial devices and their characteristics, Bipolar IC process. P-N junction Isolation, Monolithic Bipolar transistor constructions. Dielectric isolation. Isopolar and other IC structures, Monolithic Diodes, Monolithic Junction FETS, MOSFET technology, short channel MOS structures, Typical NMOS IC technologies for VLSI chips. Complementary Symmetry MOSFET technologies, Monolithic resistors. Monolithic capacitors, IC crossover, Process Monitoring.

Basic Building Blocks for ICs: [04]
Bipolar Transistor current sources independent of supply voltage variations.

Books Recommended:

1. K.R. Botkar, "Integrated circuits", Khanna Publishers.

2. J. Millman, "Microelectronics", McGraw‑Hill.

3 S. M.Sze, *VLSI Technology"*, McGraw Hill International Edition.

4. D. Nagchoudhuri, "Principles of Microelectronics Technology", A. H. Wheele.

Paper Title: - MICRO ELECTRONICS LAB

Paper Code: EECE-552　　　　　**Max. Marks: 25**

Note: At least eight experiments are to be done.

LIST OF EXPERIMENTS:

1. To analyze the failures in IC chips.
2. To study reliability of integrated circuits.
3. To study the basic IC process.
4. To study Micro-Electro Mechanical systems (MEMS).
5. To study the assembly and packing of IC.
6. To study the various connectors.
7. To study the various steps in PCB Design.
8. Project on PCB Design.

Paper Title: - ANTENNAS AND WAVE PROPAGATION (THEORY)

Paper Code: EECE- 503   Max. Marks: 100   Time: 3 hours

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A &

four from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part**

PART - A

Radiation
Radiation from short current filament, radiation resistance, directivity and gain, radiation from a current loop, half wave dipole, antenna impedance, Experiment Folded dipole, monopole, BALLINS, one dimensional broadside and endfire arrays, multiplication of patterns, effect of earth on patterns.
Feed networks for array, yagi lida array, log-percodic arrays. Dolph-Techbysheff arrays.

Practical Antennas-
Top loading and tuning, effective heights, delta machine, rhombic antenna, ferrite rod, whip antenna, Receiving antennas, Antenna temperature, frequency independent antennas.

PART - B

Ground wave Propagation
 Friis Free space equation, Reflection from earth's surface, Surface and Space wave propagation for vertical and horizontal dipole, Field strength of Space wave, Range of space wave propagation, Effective earth's radius, Effect of earth imperfections and atmosphere on space wave propagation,
Modified refractive index, Duct propagation, Tropospheric propagation.

 Ionospheric Propagation
Structure of ionosphere, propagation of radio waves through ionosphere, Refractive index of ionosphere, Reflection and refraction of waves by ionosphere, Critical frequency, Maximum usable frequency, Optimum working frequency, Lowest usable high frequency, virtual height, Skip Distance, Effect of earth's magnetic field.

   BOOKS RECOMMENDED:

1.   Collin R.E, "Antennas and Radio Wave Propagation", McGraw Hill.

2.   K.D. Prasad, "Antenna and wave Propagation", Satya Prakashan.

3.   Jordan E.C, "Electromagnetics and Radiating Systems", PHI.

4.   Balanis C.A, "Antenna Theory", John Wiley & sons
.
5.   Krauss J.D, "Antenna Theory", McGraw Hill.

Paper Title: - ADVANCED MICROPROCESSOR

Paper Code: EECE- 504   Max. Marks: 100   Time: 3 hours

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part**

PART – A

8086 Architecture*:*   [06]

CPU Architecture, internal operation, addressing modes, instructions formats, instruction execution timing.

System Bus Structure*:*   [06]

Pin diagram, Minimum mode, Maximum mode system bus timing

Assembly Language Programming*:*   [06]

Assembler Instruction formats, data transfer, Arithmetic, Branch, Loop, machine control, Shift rotate and instructions. Directives and operators, String instruction, prefix.

Modular Programming: [06]
Linking & relocation, stacks, procedures, interrupt and routines.

PART – B

I/O Interfaces: [11]
8251 A programmable communication interface, 8255 A programmable peripheral interface, 8253 programmable interval timer, Interfacing a microprocessor to keyboard, Interfacing to alphanumeric displays, Keyboards/Display controller, DMA controller 8257,Serial data transmission methods & standards.

Memory Interfacing   [06]
Memory mapped I/O, Programmed I/O, Memory organization, memory Banks, Interfacing with RAM, ROM & EPROM

Introduction to 80286, 80386   [04]

BOOKS RECOMMENDED:

1. Yu Cheng Liu & G.A.Gibson, "Microcomputer Systems 8086/8088 Family",

2. Prentice-Hall, Inc.Douglas V. Hall, "Microprocessor and Interfacing", Tata McGraw Hills.

3. A.K Ray & Burchandi, "Advanced Microprocessor", Tata McGraw Hills.

Paper Title: - ADVANCED MICROPROCESSORS LAB

Paper Code: EECE-5 Max. Marks: 25

Note: At least eight experiments are to be done

LIST OF EXPERIMENTS:

1. To study the microprocessor Intel 8086 kit.
2. Write a Program to find the sum of two 32-bit Numbers.
3. Write a Program to find the multiplication of two 32-bit Numbers.
4. Write a Program to move a block of Data.
5. Write a Program to Find the no. of Even, Odd, Positive and Negative no. in the given array.
6. Write a Program to move a block of Data in the overlapping area.
7. Write a Program to arrange the given array into descending order using BUBBLE SORT Method.
8. Write a Program to convert BCD to equivalent Seven Segment Display (HEX) code (using look up table).
9. Write a Program to find the parity of a Multi-byte No.
10. Write a Program to solve a Given Logical Expression   A + B' (C $\oplus$ D)
11. Write a Program to find the sum of two 16-digit Packed BCD Numbers and Result should also be a valid Packed BCD Number.
12. Waveform generation using 825

Paper Title: - INSTRUMENTATION

Paper Code: EECE- 505 Max. Marks: 100 Time: 3 hours

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part**

PART – A

Electronic Instruments [11]

]Electronic voltmeter,vaccum type voltmeter ,electronic multimeter ,AC voltage measurements, DC and AC current measurements. Diode sensor based instruments, measurement of power at radio frequency,CRO; construction, synchronization, measurement of voltage, current, phase & frequency.

Instrument Transformer [06]

Current and potential transformers, constructional features, ratio and phase angle error, difference between C.T. and P.T.

Displays Devices and recorders [10]

Recorders; x-y recorders, strip- chart recorders, magnetic and potentiometric recorders. Digital displays; LED& LCD.
Intoduction to Data acquisition systems.

PART - B

Transducers [18]

Terminology and definitions, classification; resistance ,potentiometer,strain gauges; theory of strain gauges, types of strain gauges, Thermistors; construction, resistance temperature characteristics, voltage current and current time

characteristics , application of therimistor .Thermocouple; construction, measurement of thermocouple output ,compensating circuits, its advantages and disadvantages.LVDT ;advantages and disadvantages and uses. Capactive transducer for measurement of liquid level and frequency response, its advantages and disadvantages and uses. Peazoelectric transducer. Ultrasonic, optical, velocity, torque, pressure, temperature, flow, humidity, moisture &chemical sensors.

BOOKS RECOMMENDED:

1. A.K. Sawhney, "Electrical and Electronic Measurements and Instrumentation", Dhanpat Rai and Sons.

2. B. Stout, "Basic Electrical Measurements", Prentice-Hall. Inc.

3. WD. Cooper, "Electronic Instrumentation and Measurement Techniques", Prentice-Hall.

4. BE. Jones, "Instrumentation, Measurement and Feedback", McGraw-Hill.

Paper Title: - INSTRUMENTATION LAB

Paper Code: EECE -555   Max. Marks: 25

 Note: At least eight experiments are to be done

LIST OF EXPERIMENTS:

1. Determination of characteristics of temperature sensor like RTD, Negative temperature coefficient thermistor, type K thermocouple.
2. Determination of Characteristics of light sensor like photo- voltaic cell, photo transistor, photo conductive cell, PIN photodiode.
3. Determination of Characteristics of displacement and force sensor such as LVDT, linear variable capacitor, strain gauge.
4. Determination of characteristics of `air flow transducer.
5. Determination of characteristics of `air pressure transducer.
6. Determination of characteristics of humidity transducer.
7. Determination of characteristics of sound transducer such as dynamic microphone, moving coil loudspeaker, buzzer.
8. Determination of characteristics of display device like LED bar graph display, moving coil meter.
9. To study Data Acquistion System.
10. Determination of frequency and phase angle using CRO.

Paper Title: NUMERICAL ANALYSIS

Paper Code: EECE-506 Max. Marks: 100 Time: 3 hours

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part**

PART – A

Solution of Algebraic and Transcendental Equations: [08]

Conditions for the convergence of the iteration method, rateof convergence of the interactive method, comparison of false position, Newton-Raphson and secant methods,conversion of a divergent functional iteration scheme into a convergent one. Acceleration of convergence, Aitken's Delta square process, error bonds, Newton-Raphson method for non linear system of equations.

Numerical Methods in Linear Algebra: [10]

Computation of determinant, pivot, partial and complete pivoting technique, triangularization algorithm, triangular decomposition of n a matrix, properties of triangular matrices, least squares curve fitting, solution of homogenous linear systems, matrix inversion, Gaussian elimination, factorization, Jacobi's and Gauss-Siedel method, Solution of tridiagonal systems, Eigenvalues and eigenvectors of a matrix, Cayley Hamilton Theorem, eigenvalues of transpose, inverse, Hermitian, quasidiagonal and similar matrices, similarity transformation, diagonalization of a matrix, power method for least eigenvalue, eigenvectors as solutions of homogenous equations.

PART – B

Linear Programming [06]
General formulation of LP problem, simplex method.

Numerical Differentiation and Integration [09]

Numerical differentiation using finite differences, numerical integration, Newton-cotes formulae-Trapezoidal rule for integration, Simpson's 1/3 rule, Simpson's 3/8 rule.

Numerical Solutions of Differential Equations [10]
Numerical solutions of first order ordinary differentials equations using Taylor's series, Picard's, Euler's, Modified Euler's method, Runge-Kutta method of fourth order, Predictor-corrector method(Milne's method and Adam's method), choice of method, stability of numerical integration procedure.

BOOKS RECOMMENDED:

1. S.S Sastry, "Introductory Methods of Numerical Analysis", Prentice-Hall of India.
2. B. S. Grewal, "Numerical Methods in Engineering and Science", Khanna Publishers.
3. E.V. Krishnamurthy & S.K. Sen, "Numerical Algorithms", Affiliated East-West Press Pvt. Ltd.

Paper Title: - SOFTWARE LAB
Paper Code: EECE – 556 Max. Marks: 25

Practical based on Commsim, Multisim, C, C++

SYLLABUS FOR
BACHELOR OF ENGINEERING (ELECTRONICS AND ELECTRICAL COMMUNICATION)

SIXTH SEMESTER

Paper Title: - **ELECTRONICS SYSTEM DESIGN**

Paper Code: **EECE 601**   Max. Marks: 100   Time: 3 hours

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART-A
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1. Review of Digital electronics concept   [02]

2. MSI and LSI Circuits and Their Applications   [05]
Arithmetic Circuits, Comparators, Multiplexers, Code Converters, XOR And AND OR INVERTER (AOI) Gates, Wired Logic, Bus Oriented Structures, Tri-State Bus System, Propagation Delay.

3. Sequential Machines   [08]
The Concept Of Memory, The Binary Cell, The Cell And The Bouncing Switch, Set /Reset, D, Clocked T, Clocked JK Flip Flop, Design Of Clock F/F, Conversion, Clocking Aspects, Clock Skew, State Diagram Synchronous Analysis Process, Design Steps For Traditional Synchronous Sequential Circuits, State Reduction, Design Steps For Next State Decoders, Design Of Out Put Decoders, Counters, Shift Registers and Memory.

PART-B

4. Multi Input System Controller Design   [15]
System Controllers, Design Phases And System Documentation, Defining The System, Timing And Frequency Considerations, Functional, Position And Detailed Flow Diagram Development, MDS Diagram, Generation, Synchronizing Two System And Choosing Controller, Architecture, State Assignment, Next State Decoders And Its Maps, Output Decoders, Clock And Power Supply Requirements, MSI Decoders, Multiplexers In System Controllers, Indirect Addressed Multiplexers Configurations, Programmable System Controllers, ROM, PLA And PAL Based Design.

5. Asynchronous Finite State Machines   [15]
Scope, Asynchronous Analysis, Design Of Asynchronous Machines, Cycle And Races, Plotting And Reading The Excitation Map, Hazards, Essential Hazards Map Entered Variable, MEV Approaches To Asynchronous Design, Hazards In Circuit Developed By MEV Method

BOOKS RECOMMENDED:

1. An Engineering Approach to Digital Design - by Fletcher PHI 1990

2. Designing with TTL Circuits - by Texas Instruments.

3. Related IEEE/IEE publications

Paper Title: - MICROWAVES ENGINEERING

Paper Code: **EECE -602**   Max. Marks: 100   Time: 3 hours

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four*   from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART - A

Microwave Tubes: [13]
 Limitations of conventional tubes, construction, operation and properties of Klystron Amplifier, reflex Klystron, Magnetron, TWT, BWO, Crossed field amplifiers.

Microwave Solid State Devices: [10]
 Limitation of conventional solid state devices at MW, Transistors (Bipolar, FET) , Diodes(Tunnel, Varactor, PIN), Transferred Electron Devices (Gunn diode), Avalanche transit time effect (IMPATT, TRAPATT, SBD)

PART- B

Microwave Components: [12]
Analysis of MW components using s-parameters, Junctions (E plane, H plane, Hybrid), Directional coupler, Bends and Corners, MW posts, S.S. tuners, Attenuators, Phase shifter, Ferrite devices (Isolator, Circulator, Gyrator), Cavity resonator, Matched Termination.

Microwave Measurements: [10]
Power measurements using calorimeters and bolometers,Measurement of SWR, Frequency and wavelength Microwave bridges.

BOOKS RECOMMENDED:

1)   Microwave devices and circuits: Samuel Liao;PHI

2)   Microwave devices and radar engg: M.Kulkarni;Umesh Publications

3)   Foundation of Microwave Engg : R.E.Collin;McGraw Hill

4)   Microwave Engg: K.C Gupta , PEARSONS EDU

5)   Microwave Engg. Passive circuits: Peter A. Rizzi

Paper Title: -: MICROWAVE ENGINEERING LAB

Paper Code: EECE -652   Max. Marks: 40

Note: At least eight experiments are to be done.

List of Experiments:

1. Study of microwave components and instruments.

2. Measurement of crystal characteristics and proof of the square law characteristics of the diode.

3. Measurement of klystron characteristics.

4. Measurement of VSWR and standing wave ratio.

5. Measurement of Dielectric constants.

6. Measurement of Directivity and coupling coefficient of a directional coupler.

7. Measurement of Q of a cavity.

8. Calibration of the attenuation constant of an attenuator.

9. Determination of the radiation characteristics and gain of an antenna.

10. Determination of the phase-shift of a phase shifter.

11. Determination of the standing wave pattern on a transmission line and finding the length and position of the

short circuited stub.

Paper Title:- MICRO CONTROLLER &EMBEDDED SYSTEMS

Paper Code: EECE 603   Max. Marks: 100   Time: 3 hours

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART- A

Introduction: [03]
8051 Micro controller: Comparison of Microprocessor and Micro-controller,
Micro-controller and embedded processors, overview of 8085 families.

8051 Assembly Language Programming: [07]
Introduction to 8051 Assembly programming,Assembling and running an 8051 program. Data Types and
          directives.8051 flag bits and PSW register. Register banks and stack.

Jump loop and call instructions, I/O Port programming: [15]

Addressing modes andAccessing memory using various addressing modes. Arithmetic instructions and programs,Logic instructions and programs, Single bit instructions and programming, Timer/counter programming in the 8051

PART - B

Serial Communication: [03]

8051 connection to RS 232, 8051 serial communication programming.

Real World Interfacing: [05]

 LCD, ADC and sensors, Stepper motor, keyboard, DAC andexternal memory

Introduction to an embedded system and its design: [08]

Introduction to ES& its applications, designparameters of an ES and its significance (With respect to all parameter), present trends in ES,Embedded System design life cycle, product specifications and hardware, software partitioning, Code sign.

Introduction to latest micro controllers such as ARM processors and its applications.

[03]

BOOKS RECOMMENDED:

a.   Ali Mazidi, "The 8051 Microocntroller and embedded Systems"

b.   David e Simon, "Am embedded software primer", Pearson Education

c.   Frank vahid and Tony Givargus , "Embedded system design, Pearson Education"

d.   Keneth J.Ayla, "Microcontroller 8051" , Penram International Publishing (India)

e.   Rajiv Kapadia, "8051 Microcontroller & Embedded Systems"., Jaico Publising House.

Paper Title: - MICRO CONTROLLER &EMBEDDED SYSTEMS

Paper Code: EECE-653   Max. Marks: 40

 Note: At least eight experiments are to be done.

 List of Experiment

1. Study of 8051/8031 Micro controller kits.
2. Write a program to add two numbers lying at two memory locations and display the result.

3. Write a program for multiplication of two numbers lying at memory location and display the result.

   4. Write a program to check a number for being ODD or EVEN and show the result on display.

   5. Write a program to split a byte in two nibbles and show the two nibbles on display.

   6. Write a Program to arrange 10 numbers stored in memory location in Ascending and Descending order.

   7. Write a program to find a factorial of a given number.

   8. Study of Interrupt structure of 8051/8031 micro controllers.

   9. Write a program to show the use of INT0 and INT1.

10. Write a program of Flashing LED connected to port 1 of the Micro Controller

11. Write a program to generate a Ramp waveform using DAC with micro controller.

12. Write a program to interface the ADC.

13. Write a program to control a stepper motor in direction, speed and number of steps.

14. Write a program to control the speed of DC motor.

15. Interfacing of high power devices to Micro-controller port-lines, LED, relays and LCD display.

Paper Title: - VHDL PROGRAMING & TECHNOLOGY

Paper Code: EECE 604   Max. Marks: 100   Time: 3 hours

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART - A
Introduction: [10]
Introduction to Computer-aided design tools for digital systems. Hardware description languages, Introduction to VHDL, Data objects, Classes and data types Operators, Overloading, Logical operators. Types of delays, Entity and Architecture declaration. Introduction to behavioral, dataflow and structural models.

VHDL   Statements: [10]
Assignmen statements, sequential Statements and process, Conditional statements, Case statements, Array and loops, Resolution functions, Packages & Libraries, Concurrent statements.

Combinational Circuit Design: [08]
VHDL models and simulation of combinational circuits such as Multiplexers, Encoders, Decoders, Code converters, Comparators, Implementation of Boolean functions etc.

PART - B

Sequential Circuit Design: [05]
VHDL Models and simulation of sequential circuits, Shift registers, Counters etc.

Design of Microcomputer: [05]

Basic components of a computer, Specifications, Architecture of a simple Microcomputer system, Implementation of a simple microcomputer system using VHDL.

Design with CPLDs and FPGAs: [07]

Programmable logic devices: ROM, PLAs, GAL, PEEL,CPLDs and FPGA. Design and implementation using CPLDs and FPGAs

BOOKS RECOMMENDED:

1. IEEE Standard VHDL Language reference Manual (1993)

2. KC Chang, "Digital Design & Modeling with VHDL & Synthesis" ,IEEE Computer Society Press.

3. Bhasker, "A VHDL Primmer",Prentice Hall 1995

4. Charles. H. Roth, "Digital System Design using VHDL" ,PWS(1998)

5. Navabi Z, "VDHL-Analysis & Modeling of Digital Systems" ,McGraw Hill

6. Perry, "VHDL-IV Edition":; TMH(2002)

7. Ercegovac. Lang & Moreno ,"Introduction to Digital Systems" , John Wiley(1999)

8. Brown and Vranesic , "Fundamentals of Digital Logic with VHDL Design" ,TMH(2000)

9.   R.P Jain' " Modern Digital Electronics-III Edition" ,TMH(2003)

Paper Title : VHDL PROGRAMMING & TECHNOLOGY

Paper Code: EECE-654   Max. Marks; 40

 Note: At least eight experiments are to be done.

Combinational Design Exercises

1. Design of Gates
    a. Design of AND gate
    b. Design of OR gate
    c. Design of XOR gate

2. Design of XOR gate using other basic gates
3. Design of 2:1 Mux using other basic gates
4. Design of 2 to 4 Decoder
5. Design of Half-Adder, Full Adder, Half Substractor, Full Substractor
6. Design of 3:8 Decoder
7. Design of 8:3 Priority Encoder
8. Design of 4 Bit Binary to Grey code Converter
9. Design of 4 Bit Binary to BCD Converter using sequential statement
10. Design an 8 Bit parity generator (with for loop and Generic statements)
11. Design of 2,s Complementer for 8-bit Binary number using Generate statements

Paper Title:- POWER ELECTRONICS.

Paper Code: - EECE 605   Maxmarks :- 100   Time :- 3 Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART - A

Characteristics of Selected Devices:

(07)

Fast recovery diodes, Schottky diode, SCR, gate trigger and commutation circuits,heat sinks, protection
circuits,
series and parallel connection of SCRs, Diac, Triac, UJT, Power MOSFETs.

Controlled Rectifier:

(07)

Half wave and full wave with resistive & R-L-E and resistive-inductive loads. Free-wheeling diode, three
phase
rectifiers, Bridge rectifiers -half controlled and fully controlled.

Inverter, Chopper And Cyclo-converter :

(09)

single phase and three phase inverters , introduction to series and parell inverters. Mc-murray bedford inverters,principle of chopper operation, control strategies, types of chopper, Jones And Morgan Chopper, cycloconverter: single phase bridge cycloconverter and its advantages and disadvantages

PART - B

Motor Control:

(09)

D.C. and A.C. motor control, reversible drives, closed loop control, commutatorless d.c. motor control.

A.C. Voltage Controllers:

<div align="center">(10)</div>

Types of AC Voltage Controllers, Integral cycle control, single phase voltage controller, Sequence control of AC

voltage (Transformer tap changers)

BOOKS RECOMMENDED:

1. P.C. Sen, "Power Electronics",Tata McGraw Hill Publishing Co., Ltd

2. S.K. Dutta, "Power Electronics and Control" Prentice Hall of India Pvt. Ltd

3. P.S . Bimbra, " Power Electronics" , Khanna publishers

4. Mohammed h Rashid, " Power Electronics Circuits Devices and Applications" ,PHI , New Delhi

5. M D Singh and K .B.khanchandani, "Power Electronics", Tata McGraw Hill Publishing Co., Ltd

Paper Title:- POWER ELECTRONICS

Paper Code:- EECE 655   Max Marks: 40

Note: At least eight experiments are to be done.

List of Practical:

1. Measurement of the following basic diode characteristics of SCR :
    (a) Forward blocking current V/S Voltage.
    (b) Reverse blocking current V/S Voltage.
    (c) Reverse gate current V/S Voltage.

2. To determine the following Turn on characteristics of SCR :
    (a) Gate trigger current (Firing current).
    (b) Gate trigger voltage.
    (c) Latching current.
    (d) Holding current.

3. Study of SCR triggering circuits and to check the performance of one type of triggering circuits.

4. Study of SCR commutation circuits and to check the performance of one type of commutation circuits.

5. Harmonic analysis of a complex voltage Wave form by harmonic analysis.

6. Study of chopper circuits to check performance of one type of chopper circuits.

7. Study of inverter circuits and to check the performance of one type of inverter circuits.

8.   Speed control of DC motor by solid state devices.

9.   Speed control of induction motor using thyristors.

10.   Basic triac characteristics.

11.   Study of excitation system of a synchronous generator using thyristors and to find excitation response.

Paper Title: - HUMAN RESOURCES MANAGEMENT.

Paper code:- AS - 606   **Max Marks :- 50**

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART – A

Introduction: Introduction to Human Resource Management and its definition, functions of Human Resource Management & its relation to other managerial functions. Nature, Scope and Importance of Human Resource Management in Industry, Role & position of Personnel function in the organization.

Procurement and Placement: Need for Human Resource Planning; Process of Human Resource Planning; Methods of Recruitment; Psychological tests and interviewing; Meaning and Importance of Placement and Induction, Employment Exchanges (Compulsory Notification of vacancies) Act 1959, The Contract Labour (Regulation & Abolition) Act 1970. Training & Development: Difference between training and Development; Principles of Training; Employee Development; Promotion-Merit v/s seniority Performance Appraisal, Career Development & Planning.

Job analysis & Design: Job Analysis: Job Description & Job Specification.

Job Satisfaction: Job satisfaction and its importance; Motivation, Factors affecting motivation, introduction to Motivation Theory; Workers ' Participation, Quality of work life.

PART-B

The Compensation Function:

Basic concepts in wage administration, company's wagepolicy, Job Evaluation, Issues in wage administration,Bonus & Incentives, Payment of Wages Act-1936, Minimum Wages Act-1961

Integration:

Human Relations and Industrial Relations; Difference between HumanRelations and Industrial Relations, Factors required for good Human Relation Policy inIndustry; Employee Employer relationship Causes and Effects of Industrial disputes;Employees Grievances & their Redressal, Administration of Discipline, Communication in organization, Absenteeism, Labour Turnover, Changing face of the Indian work force and their environment, Importance of collective Bargaining; Role of trader unions in maintaining cordial Industrial Relations.

Maintenance: Fringe & retirement terminal benefits, administration of welfare amenities, Meaning and Importance of Employee Safety, Accidents-Causes & their Prevention, Safety Previsions under the Factories Act 1948; Welfare of Employees and its Importance, Social security, Family Pension Scheme, ESI act 1948, Workmen's Gratuity Act 1972, Future challenges for Human Resource Management.

BOOKS RECOMMENDED:

1. T.N.Chhabra-, "Human Resource Management" Dhanpat Rai & Co.Recommended Reference Books:

2. Lowin B. Flippo , "Principles of personnel Management", Mc Graw-Hill

3. R.C. Saxena , " Labour Problems and social welfare", K.Math & Co.

4. A Minappa and M. S. Saiyada , " Personnel Management",Tata Mc. Graw-Hill

5. C.B. Mamoria, " Personnel Management" ,Himalaya Publishing House, Bombay

6. T.N. Bhagotiwal, " Economics of Labour and Industrial Relations" ,Sahitya Bhawan Agra

SYLLABUS FOR
BACHELOR OF ENGINEERING (ELECTRONICS AND ELECTRICAL COMMUNICATION)

SEVENTH SEMESTER

Paper Title:-DIGITAL COMMUNICATION

Paper Code:- EECE- 701   Max Marks:- 100   Time :-3Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART-A

Digital Transmission:-
        (15)
Introduction, Advantages of Digital Transmission, Pulse Code Modulation; PCM Sampling, Sampling Rate, Aliasing, quantisation error, Uniform and Non uniform quantization, Dynamic Range, Coding efficiency, A law & µ law companding, Bandwidth of PCM, Block diagram of PCM system, Delta Modulation, Continuously variable Slope Delta Modulator (CVSDM) or Adaptive Delta Modulation, Differential Pulse Code Modulation, Intersymbol Interference, Eye Patterns, Signal power in binary digital signals.

Digital Carrier Line Encoding & Multiplexing Techniques:
        (10)
Line Coding & its properties. NRZ & RZ types, (No derivation), HDB and B8ZS signaling, Fundamentals of time division multiplexing, T1 Digital Carrier system, Synchronization and Signaling of T1, TDM, PCM hierarchy, North-American Digital Hierarchy; T1 to T4 PCM TDM system (DS1 to DS4 signals), Bit versus word interleaving, Statistical TDM.

PART-B

Digital Carrier Modulation & Demodulation Techniques:
        (20)
Introduction, Information capacity, Shannon Limit for Information capacity, Bit Rate, Baud & M-Ary Encoding, Amplitude Shift Keying (ASK), ASK Spectrum, ASK Modulator, Coherent ASK Detector, Noncoherent ASK Detector, Frequency Shift Keying (FSK), FSK Bit Rate and Baud, Bandwidth and Frequency Spectrum of FSK, FSK Transmitter, Non-coherent FSK Detector, Coherent FSK Detector, FSK Detection using PLL, Binary Phase Shift Keying, Binary PSK Spectrum, BPSK Transmitter, Coherent PSK Detection, Quadrature Phase Shift Keying (QPSK), QPSK Demodulator, Offset QPSK, π /4 QPSK, Comparison of conventional QPSK, Offset QPSK and π/4 QPSK, Quadrature Amplitude Modulation (QAM); 8 QAM & 16 QAM transmitters and receivers, Band Width efficiency, Differential PSK,Constant Envelope Modulation; Minimum Shift Keying (MSK) & Gaussian Minimum Shift Keying (GMSK)

RECOMMENDED BOOKS:

1. Simon Haykin, Communication Systems, Fourth Edition, Wiley Publication
.

2   Tomasi, Electronic Communication Systems, Fourth Edition, Pearson Publications.

3. Gary M. Miller, Modern Electronic Communication, Sixth Edition, Prentice-Hall.

4. F. G. Stremler and Addison-Wesley, Introduction to Communication Systems, Third Edition.

5. E.A. Lee and D.G. Messerschmitt, Digital Communication, Kluwer Academic
     Publishers.

6. H. Meyr, M. Moeneclaey and S.A. Fechtel, Digital Communication Receivers, Wiley
     Publication.

7.   J.Proakis, Digital Communications, Second Edition, Mc Graw Hill.

Paper Title:- DIGITAL COMMUNICATION LAB

Paper Code:- EECE-751   Max. Marks :- 75

Note: At least eight experiments are to be done

LIST OF EXPERIMENTS

1. Study of Time Division Multiplexing system.

2. Study of pulse code modulation and demodulation.

3. Study of delta modulation and demodulation and observe effect of slope overload.

4. Study pulse data coding techniques for various formats.

5. Data decoding techniques for various formats.

6. Study of amplitude shift keying modulator and demodulator.

7. Study of frequency shift keying modulator and demodulator.

8. Study of phase shift keying modulator and demodulator.

9. Error Detection & Correction using Hamming Code

Experiments can be performed also on Commsim or MATLAB.

Paper Title:- DIGITAL SIGNAL PROCESSING

Paper code:- EECE-702   Max. Marks:- 100   Time :- 3 Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART-A

Continuous Time Signals:- (3)
Review of Fourier series & Fourier transform, sampling of continuous time signals.

Discrete Time Signals:- (15)
 Linear time invariant systems, stability & causality , linear constant coefficient difference equation, convolution , Z-Transform & its properties, inverse z transform, Discrete Fourier transform and its properties, fast Fourier transform, decimation in time and decimation in frequency algorithms.

Digital Filters:- (03)
Frequency domain representation of discrete time systems, systems function, Ideal low pass filter.

PART-B

Design of IIR filters:- (07)
Impulse invariance technique, Bilinear transformation. Design of IIR filters using butter worth, chebyshev and elliptic filter digital frequency transformation.

Design of FIR filters- (08)
Window technique, frequency sampling technique, equirripple, approximate technique, comparison of FIR and IIR filters.

Realization of Digital systems:- (09)
Block diagrams and signal flow graphs for FIR and IIR systems. Direct form, cascade and parallel form for IIR.

BOOKS RECOMMENDED:

1. Johnny R. Johnson, Introduction to Digital Signal Processing.

2. A. V. Oppenheim and R.W. Schafer, Digital Signal Processing, PHI Latest Edition.

3. A. V. Oppenheim and R.W. Schafer, Digital Signal Processing.

4. Sanjit and Mitra, Digital Signal Processing, Tata McGraw Hill.

5. A.V. Oppenheim and R.W. Schafer, Discrete Time Signal Processing,Pearson Education Ltd.

Paper Title:-DIGITAL SIGNAL PROCESSING

Paper Code:- EECE- 752   Max Marks:- 75

Note: At least eight experiments are to be done

LIST OF EXPERIMENTS

1. Hands on experience on MATLAB
2. Hands on experience on DSP training kits.
3. Obtain Fourier transform of an analog signal.

4. Obtain discreet Fourier transform of a finite duration signal.

5. Design on IIR low pass filter using butter worth technique.

6. Design FIR low pass filter.

7. Display filtered signals in time domain.

8. Determine the spectral characteristics of speech.

Paper Title:- WIRELESS AND MOBILE COMMUNICATION

Paper Code:- EECE- 703   Max. Marks:- 100   Time :- 3 Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART-A

1. Introduction:-
(10)
Radio Propagation Characteristics, Models for Path loss, shadowing & Multipath fading-delay spread, Coherence bandwidth, Coherence Time, Doppler Spread.The Cellular concept, Frequency Reuse, basic theory of hexagonal cell layout, spectrum efficiency, FDM/TDM, Cellular System, channel allocation schemes, Handover Analysis cellular CDMA, Soft capacity, Erlang capacity comparison.

2. Modulation Techniques:-
(11)

Digital Modulation for Mobile radio, Analysis under fading channel, diversity techniques and Rake demodulator. Introduction to Spread Spectrum Communication Multiple Access Techniques used in Mobile Wireless Communications: FDMA/TDMA/CDMA.

PART-B

3. Wireless Networking:-
(12)
Satellite Communications: satellite parameter and configuration, capacity allocation, Cellular Transmission Principles, Cordless Systems and Wireless Local Loop Mobile IP and Wireless access protocol. Wireless LAN Technology: infrared LAN, spread spectrum LAN, narrowband microwave LAN, IEEE 802.11 Wireless LAN standards: protocol architecture and services.

4. Wireless Standards:-
(12)
Wireless standards-GSM, IS-95, UMTS-IMT-2000, Signaling, Call Control, Mobility Management and location Tracing

BOOKS RECOMMENDED:

1. Theodore S.Rappaport, Wireless Communications Principles and Practice, IEEE Press, Prentice Hall.
2. William C.Y.Lec, Mobile Cellular Telecommunications, Analog and Digital Systems, Mc-Graw Hill Inc.

3. Kamilo Feher, Wireless Digital Communications, Modernization & Spread Spectrum Applications, Prentice Hall of India, New Delhi.

4. Kaveh Pahlavan and Allen H. Levesque "Wireless Information Networks", Wiley Series, John Wiley and Sons Inc.

5. Stallings, Wireless Communication and Networks
.
6. Schiller, Mobile Communication, Prentice Hall.

7. Lee, Mobile Communication, Pearson Education.

8. Related IEEE/IEE publications

Paper Title:- NEURAL NETWORKS AND FUZZY LOGIC(ELECTIVE)

Paper Code: - EECE 704　　　　　Max. Marks:- 100　　　　　Time:- 3Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART-A

Neural Networks Characteristics:
　　　　(08)
History of development in neural networks, artificial neural net terminology, Model of a neuron, Topology, Types of learning, Supervised, Unsupervised learning.

Basic learning laws:-
　　　　(05)
Hebb's rule, Delta rule, Widrow and Hoff LMS learning rule, correlation learning rule, instar and outstar learning rules.

Unsupervised Learning:
　　　　(05)
Competitive learning, K-means clustering algorithm, kohonen's feature maps.

Radial Basis Function Neural Networks:
　　　　(05)
Recurrent networks, Real Time Recurrent, and learning algorithm.

PART-B

Introduction to Counter Propagation Networks:-
　　　　(06)
CMAC network, ART networks.

Applications of neural nets such as pattern recognition:
(06)
Optimization, control, speech and decision-making.

Fuzzy Logic: -
(10)
Basic concepts of Fuzzy Logic, Fuzzy VS Crisp Set, Linguistic variables, membership functions, operations of fuzzy sets, Fuzzy IF-THEN rules, variable inference techniques, defuzification techniques, basic fuzzy inference algorithm, applications of fuzzy logic, fuzzy system design, implementation of fuzzy system, useful tools supporting design.

BOOKS RECOMMENDED :

1. Riza C Berkin and Trubatch, *"Fuzzy systems Design Principles"*, Building a Fuzzy IF-THEN Rule Bases, IEEE Press ISBN 0-7803-1151-5.

2. Yegna Narayanan,"*Artificial Neural Networks"*.

3. Bart Kosko,"*Neural Networks and Fuzzy Logic"*.
4. Simon Haykin,"*Neutral Networks"*.

5. Yen and Langari, "Fuzzy Logic: Intelligence, Control and Information", Pearson Education India.

Paper Title:- ARTIFICIAL INTELLIGENCE

Paper Code:- EECE 704   Max. Marks:- 100   Time :- 3Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART-A
Introduction:-
(03)
The importance of AI, Early work in AI, AI and related fields, introducing intelligence   in the methods of attack, criteria for success.

Problem Solving:-
(08)
Control strategies, heuristic search, problem characteristics, forward versus backward reasoning, problem tree versus problem graphs, matching, heuristic functions, weak methods, problem reduction and constraint satisfaction.

Knowledge Representation:-
(08)

Definition and importance of knowledge, representing single facts in logic, resolution non-monotonic reasoning, Dealing within inconsistencies and uncertainties, Fuzzy logic, Bayesian probabilistic interference, dempster shafrer theory, Ad-Hoc methods, Heuristic reasoning methods, structural representation of knowledge graphs, frames and related structures.

PART-B

Natural Language Processing:-

Overview of Linguistics, Grammars and Languages, Basic Paying Techniques, Semantic Analysis and Representation Structures, Natural language generation, natural system.
(10)

Pattern Recognition:-
Recognition and classification process, learning classification patterns, recognizing and understanding speech.

(10)

Expert System:-

Rule based system architectures, model based system, constraint satisfaction dealing with uncertainties, knowledge acquisition and validation expert system building tools. Introduction to neural networks, learning algorithms and models.

(06)

BOOKS RECOMMENDED:

1. Dan W.Patterson,Introduction To Artificial Intelligence and Expert System,PHI.

2. Elaine Rich, Artificial Intelligence, Mc-Graw Hill.

Paper Title:- WEB TECHNOLOGIES

Paper Code:- EECE 704   Max. Marks:- 100   Time :- 3Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART- A
Internet And World Wide Web: -   (06)
Introduction, Internet Addressing, ISP, types of Internet Connections, Introduction to   WWW, WEB Browsers, WEB Servers, URLS, http, WEB applications, Tools for WEB   site creation.

HTML:-   (06)
Introduction to HTML, Lists, adding graphics to HTML page, creating tables, linking documents, frames, DHTML and Style sheets

Java Script:- (08)

Introduction, programming constructs: variables, operators and expressions, conditional checking, functions and dialog boxes, JavaScript DOM, creating forms, introduction to Cookies.

PART B

Java: - (15)

Introduction to java objects and classes, control statements, arrays, inheritance, polymorphism, Exception handling, Multithreading, Building the Java Applets, Boxes, Radio Button, Managing Multiple controls, Scrollbars, Choice controls, Scrolling lists, Windows, Menu and Dialog Boxes, Pop up Windows, Graphics in Java, Mouse events,
Drawing Objects, Fonts, Canvases, Images, Image maps, Graphics, Animation.

XML: - (10)
Why XML, XML syntax rules, XML elements, XML attributes, XML DTD displaying XML with CSS.

BOOKS RECOMMENDED

1. Java,How to Program, 6th edition, H.M. Deitel, P,J. Deitel

2. Java 2: The Complete Reference, Fifth Edition, TMH

3. Web Enabled Commercial Application Development, by Ivan Bayross, BPB.

4. Learning XML by Eric T.Ray, Second edition.

Paper Title:- RADAR ENGINEERING

Paper code: - EECE 704   Max. marks: 100   Time :- 3 Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART-A

Introduction to Radar Systems :-
                (20)
Radar equation, FM-CW radar, altimeter, MTI, pulse Doppler radar. Tracking radar-lobe switching, conical scan, mono-pulse, FM pulse compression radar. SAR, ECCM.

PART-B
Radar Antennas :-
        (07)

Paraboloid, lenses, cosecant squared antenna.

Navigation:-
(18)

Loop antenna, automatic direction finder, radio range, TACAN, ILS, GCA, Microwave landing System, LORAN & DECCA, Missile guidance and seeker systems.

BOOKS RECOMMENDED:

1. Sen & Bhattacharya, Radar systems & Radio Aids to Navigation, Khanna Publications.

2. M.I. Skolonik , Introduction to Radar Systems, Mc Graw hill.

3. Kulkarni,Radar Engg,Laxmi Publications..

Paper Title:- SEMINAR 1

Paper Code:- EECE-753

Seminar topics to be allotted by teacher concerned based on the latest topic in the subject concerned.

Paper Title:- MINOR PROJECT

Paper Code:- EECE -754   Max Marks:- 100

SYLLABUS FOR
BACHELOR OF ENGINEERING (ELECTRONICS AND ELECTRICAL COMMUNICATION)

EIGHTH SEMESTER

Paper Title:- OPTICAL FIBER COMMUNICATIONS

Paper code: EECE 801   Max. Marks :- 100   Time:- 3Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART-A

Introduction:
Need of Fiber Optic Communications, Evolution of Light wave Systems, Basic Concepts, Analog & Digital Signals, Channel Multiplexing, Modulation Formats, Optical Communication Systems, Light wave System Components, Optical Fibers as a Communication Channel, Optical Transmitters, Optical Receivers.

Optical Fibers:
Geometrical-Optics Description, Step-Index Fibers, Graded Index Fibers, Wave Propagation, Maxwell's Equations, Fiber Modes, Single-Mode-Fibers, Dispersion in Single-Mode Fibers, Group Velocity Dispersion, Material Dispersion, Wave guide Dispersion, Higher-order Dispersion, Polarization-Mode Dispersion, Dispersion-Induced Limitations, Basic Propagation Equation, Chirped Gaussian Pulses, Limitations on the Bit Rate, Fiber Bandwidth, Fiber Losses, Attenuation Coefficient, Material Absorption, Rayleigh scattering, wave guide Imperfections, Nonlinear Optical effects, Stimulated Light Scattering, Nonlinear Phase Modulation, Four Wave Mixing, Fiber Manufacturing, Design Issues, Fabrication Methods, Cables and Connectors

PART-B

Optical Transmitters:
Basic Concepts, Emission and Absorption Rates, p-n Junctions, Non radiative Recombination, Semi conductor Materials, Light Emitting Diodes, Power-current Characteristics, LED spectrum, Modulation Response, LED Structures, Semi Conductor Lasers, DFB Lasers, Coupled Cavity semiconductor Lasers, Tunable Semiconductor Lasers, Vertical Cavity Semiconductor Lasers, Laser
Characteristics, Small & Large Signal Modulation, Spectral Line width, Source Fiber Coupling.

Optical Receivers:
Basic concepts, p-n Photo Diodes, p-i-n Photo Diodes, Avalanche Photo Diode, MSM Photo detector, Receiver Design, Receiver Noise, Noise mechanism, Receiver sensitivity, Bit error rate, Minimum Receiver Power, Sensitivity Degradation, Receiver Performance.

Multi channel Systems:
WDM Light wave systems, Optical TDM Systems, Subscriber Multiplexing, Code Division Multiplexing.

BOOKS RECOMMENDED:

1. Govind P. Aggarwal, Fiber Optics Communication Systems John Wiley & Sons (Asia)Pte Ltd.

2. Senior J. Optical Fiber Communications, Principles & Practice, PHI.

3. Keiser G., Optical Fiber Communication Mc graw-hill.

Paper Title:- OPTICAL FIBER COMMUNICATIONS

Paper Code: EECE 851   Max. Marks :- 25

Note: At least eight experiments are to be done

1.   To determine the Numerical aperture of a given fiber and losses in optical fiber.
2.   To determine the V. Parameter the core radius and core cladding dielectric constant difference of a Step Index Single Mode fiber.
3.   To measure the cut off wave length of a single mode fiber.
4.   To study fiber optical analog link.
5.   To study fiber optical digital link.
6.   To study the effect of EMI/RFI on an optical fiber medium.
7.   To study the effect of pulse broadening on the bandwidth of a fiber optical link.
8.   To set up the multiplexer and observe the simultaneous transmission of several channels on fiber optical link.
9.   To study Manchester coding/decoding of fiber optical link.
10.   To study the linearized A-Law PCM coding on fiber optical link.
11.   To study laser communication system.
12.   To set up digital optical link using PC.
13.   To study various characteristics of fiber using PC.
14.   Use of connecterisation kit.
15.   To study the following instruments:
        (a)   Fiber optical power meter.
        (b)   Fiber optical power source.

Paper Title:- COMPUTER NETWORK

Paper Code: - EECE 802   Max. Marks :- 100   Time:- 3Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART-A

Brief Introduction:
Uses of computer Networks, Network Hardware, Network software, OSI and TCP/IP reference Models, Novell Netware, ARPA Networks, NSF NET, Internet Communication services, SMDS, X. 25 ISDN Network standardization.
-232c and RS-449 switching circuits, virtual circuits, Narrow band, ISDN.

Data Link Layer:
Design issues, Elementary data link protocols, sliding window protocols, protocol specifications, Data link layer in the internet and ATM.

Medium Access Sub Layer:
Channel allocation problems, ALOHA, Carrier Sense Multiple Access Protocol, CSMA/CD, CDMA

PART-B

Network Layer:
Design issues, Routing Algorithm, congestion control algorithm Internet working, the network layer in the Internet.

Transport Layer:
Services, protocols, Performance issues.

Application Layer:
Network security, DNS, SNMP, Electronic Mail, World Wide Web, Multimedia.

BOOKS RECOMMENDED:
Computer Networks by Andrew S. Tanebaum (3rd Edition), PHI.

Paper Title:- COMPUTER NETWORKING

Paper Code:- EECE 852   Max. Marks :- 25

Note: At least eight experiments are to be done

1. To study different connecting cables and their comparisons.
2. To study sharing and transfer of data in local area network.
3. To study the ping commands and its utilities.
4. To study the remote login in computer system.
5. To configure a single pc as a router.
6. To examine the differences VLAN and LAN.
7. To plan a network in a organization
8. To study IP configuration.
9. To study netstat, all commands**.**

ELECTIVES

Paper Title:- DIGITAL IMAGE PROCESSING

Paper Code:-EECE 803   Max Marks:- 100   Time:- 3Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART A

Introduction
Fundamental Steps in Image Processing, Elements of Digital Image Processing, Image Acquisition, Storage, Processing, Communication, Display.

Image Perception

Structure of the human eye, light, luminance, brightness, contrast, image model, sampling and quantization-uniform and non uniform, basic relationships between pixels, imaging geometry, camera model, stereo imaging.

Image Enhancement

Spatial domain methods, Frequency domain methods, Enhancement by point processing, histogram processing, image subtraction, image averaging, spatial filtering, smoothing filters, sharpening filters, Enhancement in the frequency domain, Color image processing.

PART B

Image Transforms

Fourier Transform, Discrete Fourier Transform, Properties of the Two-Dimensional Fourier Transform, Fast Fourier Transform, Inverse FFT, Walsh Transform, Discrete Cosine Transform, Haar Transform, Slant Transform.

Image Compression

Fundamentals, Coding Redundancy, Interpixel Redundancy, Psychovisual Redundancy, Fidelity Criteria, Image Compression Models, Source Encoder and Decoder, Channel Encoder and Decoder, Elements of Information Theory, Measuring Information, Information Channel, Fundamental Coding Theorems, Using Information Theory, Error-Free Compression, Variable-Length Coding, Bit-Plane Coding, Lossless Predictive Coding, Lossy Compression, Lossy Predictive Coding, Transform Coding, Image Compression Standards.

BOOKS RECOMMENDED

1. Digital Image Processing, by William K. Pratt, TMH

2. Fundamentals of Digital Image Processing, by Anil K. Jain, Pearson Education

3. Digital Image Processing, by R. C. Gonzalez and R. E. Woods, Pearson Education

4. Digital Image Processing and Analysis, by B. Chandra and D. Dutta Majumder.

Paper Title: - SATELLITE COMMUNICATION

Paper Code: - EECE 803　　　　　Max. Marks: - 100　　　　　　　　　　Time: - 3Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART-A

Introduction:
Origin of Satellite Communication, Current state of Satellite Communication, Advantages of Satellite Communication, Active & Passive satellite, Orbital aspects of Satellite Communication, System's Performance.

Communication Satellite Link Design:

Introduction, general link design equation, System noise temperature, C/N & G/T ratio, atmospheric & econospheric effects on link Design, complete link design, interference effects on complete link design earth station Parameters.

Satellite analog & digital communication:

Base band analog (voice) signal, FDMA Techniques, S/N ration, SCPC & CSSB systems, digital base band signals & modulation Techniques.

PART-B

Multiple Access Techniques:

TDMA frame structure, burst structure, frame efficiency, Super frame, frame acquisition & synchronization, TDMA vs. FDMA, burst time plan, Beam hopping, satellite switched, Erlang call congestion formula, demand assignment Ctrl, DA - FDMA system, DA - TDMA.

Satellite Applications:

Satellite TV, telephone services via satellite, Data Communication services and satellites for earth observation, weather forecast, military appliances, scientific studies.

BOOKS RECOMMENDED:

1. D.C Aggarwal, "Satellite Communication"

2. J.Martin-Prentice Hall, "Communication satellite Systems"

3. Timothy Pratt, Charles W. Bostian, "*Satellite communication*" John Wiley & sons   publication
   .
4. Spilker J J, "*Digital Communication by satellite*" , PH Publication

5. Martin J, "*Communication satellite systems*", PH publication.

6. Timothy Pratt, Charles W. Bostian, Jeremy Allnutt, "*Satellite Communications*" 2nd Wiley, John & Sons, 2002.

7. Gerard Maral, Michel Bousquet, "*Satellite Communications Systems: Systems, Techniques and Technology*" 4th ed., Wiley, John & Sons, (20

Paper Tilte:- NANO TECHNOLOGY

Paper Code: EECE 803   Max. Marks:- 100   Time:- 3Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART A

Introduction to Physics of the Solid State:

Structure, Size dependence of properties, Crystal structures, Face-Centered cubic nanoparticles,Tetrahedrally Bonded semiconductor structures, Lattice Vibrations, Energy Bands,Insulators,Semiconductors and conductors,Resiprocal Space, Energy Bonds and Gaps of Semiconductors, Effective masses, Fermi surfaces, Localized particles,Donors,Acceptors and Deep Traps,Mobility,Excitons.

Properties of Individual Nanoparticles:

Introduction to Semiconducting Nanoparticles, Introduction to Quantum Dots,wells,wires,Preparation of Quantum Nanostructures, Introduction to Carbon Nanotubes,Fabrication,Structure,Electrical properties,Vibrational properties, Mechanical properties.

Biological Materials:

Biological Building Blocks, Nucleic Acids, Biological Nanostructures.

PART B

Tools:
TEM, Infrared and Raman Spectroscopy, Photoemission and X-RAY spectroscopy, Electron microscopy, SPMs, AFMs, Electrostatic force Microscope, Magnetic force microscope

Nanoscale Devices:
Introduction, Nanoscale MOSFET-planer and non planer, Resonant-tunneling diodes,
Single electron transistor, Quantum-Dot, Nano-electrochemical systems, Molecular/Bimolecular electron devices,

Reference Books:
1. Nanotechnology: G.Timp, Bell Labs, Murray Hill, NJ(Ed.)

2. Inroduction to Nanotechnology-Charless P. Poole, Wiley International

3. Nano Systems: Molecular machinery, manufactureing and computation: Eric Drexler, John wiley and sons.

Paper Title: - COMPUTER ARCHITECTURE

Paper Code: EECE 804   **Max. Marks:- 100**   **Time:- 3 Hrs**

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**

PART-A

Basic Computer Organization and Design:
Set of Computer Instructions, Registers, timing and Control Signals, flow charts for instruction cycle, flow charts for interrupt cycle, Design of hard wired control unit, control unit, control memory, Design of micro-programmes control unit.

Central Processing Organization:
Processor bus organization Arithmetic Logic Unit (ALU)

Arithmetic Processor Deign:
Addition and subtraction of unsigned binary numbers, Addition and subtraction Algorithm for signed binary numbers, Multiplication Algorithm, Division algorithm for signal and unsigned binary numbers, Floating Point Arithmetic Operations.

PART-B

Memory Organization:
Memory technology, address mapping in RAM & ROM, memory Hierarchies, virtual memory, cache memory, Interleaved and Associative memories, memory management unit, hard disk drive, floppy disk drive and CD-ROM.

Parallel Processing
Types of parallel processors, performance considerations, puipe line processors, multiprocessors, Array processors.

BOOKS RECOMMENDED:

1. Computer Architecture Organisation by John P. Hayes.

2. Computer System Architecture by Morris Mano.

3. Modern Computer Architecture by Mohammad Refiquzzaman & Rajan Chandra.

Paper Title:- VLSI DESIGN

Paper Code:- EECE 805   Max Marks:- 100   Time: 3 Hrs

Note for paper setter: Total of *Eight* questions may be set covering the whole syllabus taking *four* from Part A & *four* from Part B. Candidates will be required to **attempt any *five* questions taking at least two from each Part.**
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PART - A

1. **Introduction to MOS Technology:**
   Enhancement & depletion mode transistors.

2. **MOS Transistors**:
   Parameters pass transistor, NMOS inverters, CMOS   Inverters, MOS Transistor circuit model, Latch up in CMOS circuits, Basic gates, Depletion & enhance mode pull ups.

3**.   MOS Circuit Design Processes**:
   MOS layers stick diagrams, design rules and layout.

4**.   Basic circuit concepts**:
   Sheet resistance concept applied to MOS transistors and Inverters Area Capacitance of layers,
    Inverter delays, Super buffers, propagation delays.

PART-B

5.   **Subsystem Design and Layout**:
   Switch logic, gate logic, inverter, two input NMOS,CMOS and BICMOS NAND and NOR gates,
    Design of Combinational Circuits, PLA Design of Sequential Circuits –two phase clock dynamic
    shift registers, register to register transfer, Finite State Machines.

6**.   Implementing Integrated System Design**:
   Patterning and fabrication, hand layout and digitization using a symbolic layout language, the
    Caltech immediate form for LSI layout description, the multi-project chip.

7.   **Overview of an LSI Computer System and Design of OM2 Data Path Chip:**
    System overview, overall structure of data path, ALU,ALU register, Buses, Shifter, Array etc.

BOOKS RECOMMENDED:

   1. S.M.SZE—VLSI Technology Mc-Graw Hill.

   2. Murarka & Peckerar-- Electronic Materials, Science & Technology.

   3. VLSI Design by Pucknell

Paper Title:- SEMINAR-2

Paper Code:- EECE 855

Seminar topics to be allotted by teacher concerned based on the latest topic in the subject concerned.

Paper Title:-MAJOR PROJECT

Paper code:- EECE 854   Max. Marks:- 100

Project topics to be allotted by guide concerned.