

EB/EC/EE/EI/CE/CS/IT/ME/SE 301 ENGINEERING MATHEMATICS II

Module 1

Matrices and Vector spaces: Rank of matrix, Echelon and normal form, Solutions of linear systems of algebraic equations, Eigen values and Eigen vectors, Cayley- Hamilton theorem (no proof). Vector Spaces- Subspaces,-Linear Independence of vectors-Linear span-Dimension and Basis. Linear transformations.

Module 2

Fourier series and Fourier integrals: Fourier series of Periodic functions-Euler formulae for Fourier coefficients- functions having period 2π , arbitrary period- even and odd functions-half range expansions, Fourier integral, Fourier cosine and sine transformations, linearity property, transform of derivatives, convolution theorem (no proof)

Module 3

Laplace transforms: Linearity property, transforms of elementary functions, Laplace transforms of derivatives and integrals, differentiation and integration of transforms, convolution theorem (no proof), use of Laplace transforms in the solution of initial value problems, unit step function, impulse function - transform of step functions, transforms of periodic functions.

Module 4

Vector calculus : Scalar and Vector point functions-Gradient and directional derivative of a scalar point functions.- Divergence and Curl of a vector point functions- their physical meanings.

Evaluation of line integral, surface integral and volume integrals, Gauss's divergence theorem,. Stoke's theorem (No Proof of these theorem), conservative force fields, scalar potential.

Text books:

1. R.K. Jain, S.R.K Iyengar: Advanced Engineering Mathematics, Narosa publishers.1991
2. C.R. Wilie & L.C. Barrett: Advanced Engineering Mathematics, MGH Co.

References

1. Larry C Andrews, Ronald C Philips: Mathematical Techniques for Engineers & Scientists, PHI
2. M.C. Potter, J.L. Goldberg: Advanced Engineering Mathematics, Oxford university press
3. B. S. Grewal: Higher Engineering Mathematics, Khanna publishers,1986

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS 302 LOGIC DESIGN

Module 1

Number Systems and codes: Binary ,Octal and Hexa decimal number Systems-Binary arithmetic ,binary code,Excess-3 code, Gray error detection and correction.

Boolean Algebra: Postulates and theorems, representation of switching functions –SOP and POS forms –Karnaugh map representation –Minimization using K-maps.

Module 2

Design of combinational circuits:-Tabular minimization:- Design of single output and multi-output functions-Design using AND,OR,NOT ,NAND NOR and EX-OR gates, Logic circuits from Boolean Expressions. Design using MSI and LSI devices-Digital Multiplexer /Selector Decoder. Demultiplexer –Design of 4 bit adder, Carry look ahead adder –BCD Converter,Logic implementation using ROM,PAL and PLA.

Module 3

Introduction to Sequential Ckts: combinational Versus sequential Circuits, Asynchronous Versus Synchronous circuits-Memory elements and their Excitation function-Tff, Dff, RSff, JK ffs and their excitation requirements –Design of Sequential Circuits- Shift Registers, Counters –Synchronous and Asynchronous counters, Up– Down counters, Modular Counter, Ring Counter, Johnson counter ,Analysis of Sequential circuits-State table and Diagrams.

Module 4

Logic Families: RTL ,DTL ,TTL,CMOS –Tristate logic –Specification and transfer characteristics of basic TTL interfaces,-Standard logic levels-Current and voltage parameters-fan in and fan out –Propagation delay, integrated circuit modules, noise consideration-Interfacing of CMOS to TTL and interfacing of TTL to CMOS.

Text Book:

1. Yarbrough, “Digital Logic Applications And Design” , Thomson Learning, India

References:

1. Taub & Schilling ,”Digital Integrated Electronics”, Mc Graw Hill
2. Samuel C Lee ,”Digital Circuits and logic Design”,Prentice Hall
3. A p Malvino , “ Digital Computer Electronics “, Tata Mc Graw Hill
4. Morris Miller ,”Design with TTL integrated Circuit”, Mc Graw hill
5. Peatman, ”Digital Hardware Design “,” , Mc Graw Hill
6. Ronald J Tocci ,”Digital Systems ,Principles and Applications”, Prentice Hall
7. Lloyd ,”Digital Fundamentals “, universal , N .Delhi
8. Mercins , “Switching Circuits “, Prentice Hall
9. MOS-LSI Circuits , Publication of Texas Instruments
10. Douglas v hall ,” Digital Circuits and Systems “, Mc Graw Hill
11. R P Jain , Principles of Digital Electronics
12. Mike Toolay, “Electronic Circuits – Fundamentals and Applications”, Elsevier, New Delhi

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 303 DISCRETE COMPUTATIONAL STRUCTURES

Module 1

Logics and Proofs ,propositions, conditional propositions and logical equivalences, quantifiers, proofs resolution, mathematical induction ,sets ,relations ,equivalence relations ,functions.

Module 2

Algorithms introduction, notations, recursive algorithms, complexity of algorithm, counting methods and pigeon hole principle, recurrence relations.

Module 3

Graph theory, paths and cycles, Hamiltonian cycles, representation of graphs, Eulerian paths, traveling sales man problem, trees, characterization, spanning trees, game trees.

Module 4

Algebraic systems semi groups, monoid, subgroups, homomorphism, isomorphism automorphism , rings, sub rings, posets, lattice, hasse diagrams

Text books:

1. Richard Johnsonbaugh - Discrete Mathematics Pearson Education fifth edition
2. Satinder Bal Gupta - Discrete mathematical structures Laxmi publications III edition

References:

1. Malik D. S., Sen S. K - Discrete Mathematical Structures , Thomson Learning
2. Garry Haggard, John Schlipf, Sue Whitesides, Discrete Mathematics for Computer Science, Thomson Learning
3. Bernard Kolman, Robert C Busby, Sharon Cutler Ross, Nadeem-ur-rehman Discrete mathematical structures, Pearson Education
4. J P Tremblay and Manohar Mc Graw Hill - Discrete mathematical structures with applications to computer science -
5. John Truss Addison Wesley- Discrete mathematical structures for Computer science

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS/IT 304 OBJECT ORIENTED PROGRAMING USING C++

Module 1

Object oriented technology, comparison with procedural programming (C and C++),key concepts of object programming, input and output in C++, declarations ,control structures, functions

Module 2

Classes and Objects, declaring objects, accessing member variables, defining member functions, inline functions, static member variables and functions, friend function, overloading, constructors and destructors, overloading constructors, copy constructors anonymous objects, dynamic initialization using constructors, dynamic operators and constructors, recursive constructors encapsulation

Module 3

Inheritance, types of inheritance, virtual base class, abstract class, advantages and disadvantages of inheritance, pointers and arrays, C++ and memory

Module 4

Binding, polymorphism and virtual functions, generic programming with templates, exception handling, string handling and file handling

Text Books:

1. Ashok N Kamthane , Pearson education - Object oriented programming with ANSI and TURBO C++ ,
2. Saurav Sahay - Object oriented programming with C++, Oxford

References:

1. Malik, Thomson Learning C++ Programming :From Problem Analysis To Program Design,
2. Forouzan, Thomson Learning - Computer Science :A Structured Approach Using C++,2nd Ed.,

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

CS305 PRINCIPLES OF PROGRAMING LANGUAGES

Module 1

Programming domains. Language Evaluation. Programming paradigms -Imperative programming, Functional programming, Object oriented programming, Logic programming. Formal methods of describing syntax and semantics - Backus Naur Form, Attribute grammars. Describing semantics - Denotational semantics.

Module 2

Data types, Names, Variables, Bindings, Scope and lifetime, Referencing Environments- Named Constants-Variable Initialization-Subprograms-Parameter Passing-Coroutines.

Module 3

Data abstraction and encapsulation. Polymorphism and inheritance. Features of object-oriented languages - Smalltalk, C++ and Java. Design and implementation issues. Exception handling.

Module 4

Functional programming languages - Lambda calculus - Introduction to pure LISP . Application of functional programming languages. Logic programming languages - a brief introduction to predicate calculus - Horn clauses - Logic programming. Introduction to Prolog. Applications of Logic programming.

Text Books:

1. Robert W. Sebesta, "Concepts of Programming Languages".
2. Ravi Sethi, "Programming Languages-concepts and constructs", Addison Wesley, Second Edition , 1996.

References:

1. Michael L. Scott, "Programming Language Pragmatics – Elsevier, New Delhi
2. Thomson Learning, Kenneth.C.Louden, "Programming Languages:Principles And Practices" ,2nd Ed.,.
3. Terence W. Pratt, "Programming Languages", Prentice Hall , Ninth edition 1996.
4. Michael J Gordon, "Programming Language Theory and its implementation", Prentice Hall ,1991
5. Bjarn Stroustrup, "Design and Evolution of C++", Addison Wesley, 1991
6. "Symbolic Logic and Logic programming", Learning Material Series, Indian Society for Tech. Education, 1996
7. James Gosling "Java Programming Language", Addison Wesley,

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

EB/EE/CS 306 ELECTRONIC DEVICES & CIRCUITS

Module I

DC power supplies - power transformers - rectification - half wave , full wave, bridge - expression for ripple factor, efficiency, comparison, diode ratings. filters - capacitor - inductor LC filters- use of bleeder resistor - voltage multipliers - dual power supplies - zener and avalanche diodes - simple and series voltage regulator. *Special semiconductor devices*: Principles and operation of photodiodes, PIN diodes, phototransistors, LED, UJT. MOSFET- basic principles & characteristics.

Module II

Small Signal amplifiers: Bipolar junction transistor – configurations, characteristics - current amplification factors - relations between alpha & beta – comparison. *BJT amplifiers*: Biasing techniques of BJT- stabilization of operating point - h-parameters - CE RC coupled amplifier - concept of load lines- frequency response of RC coupled amplifier - frequency analysis of RC coupled amplifier - lower cut-off frequency - upper cut-off frequency - 3 db bandwidth.

FET Amplifiers: Principle of operation, characteristics, Common source amplifier- design, frequency response-applications

Module III

Power amplifier - classification - class A, B, AB and C power amplifiers-tuned amplifier- push-pull and complementary symmetry power amplifier –Harmonic distortion – Heat sinks.

Feed-back amplifiers: concept of Negative and positive feedback – Barkhausen criteria -low frequency sinusoidal oscillators

High frequency oscillators – types- LC, Crystal oscillators –circuit diagram-description-applications

Module IV

Pulse Circuits:-Different types Pulse circuits - pulse characteristics - Pulse shaping using RC circuits - Differentiating and integrating circuits –applications. Clipping and clamping circuits using diodes - *Transistor as a switch*– simple sweep circuits-bootstrap sweep.

Multivibrators-astable, monostable and bistable circuits using BJTs-applications

Text book:

1. Boylestead & Neshelsky, *Electronic Devices & Circuit Theory*, Prentice Hall of India.2003
2. Millman & Halkias, *Electronic Devices & Circuits*, Tata McGraw Hill, New Delhi.1996
3. Taub &Schilling, *Pulse,digital and Switching circuits*,Tata Mc Graw Hill 2002

References:

1. Bapat Y N, *Electronic Devices & Circuits*, Tata McGraw Hill, New Delhi.1995
2. Allan Mottorshed, *Electronic Devices & Circuits*, Prentice Hall of India, New Delhi.2003
3. Schilling & Belove, *Electronic Circuits, Discrete & Integrated*, Tata McGraw Hill, New Delhi 1989
4. Theodore F.Bogart, *Electronic Devices & Circuits* Universal Book Stall, New Delhi 1992

Type of questions for University Examination

Question 1 - 8 short answer questions of 5 marks each. 2 questions from each module

Question 2-5 – There will be two choices from each module .Answer one question from each module of 15 marks

EE/CS 307 ELECTRONICS CIRCUITS LABORATORY

1. Study of - Multimeter, Signal generators, CRO etc. and measurement of electrical quantities (Voltage, Current, FREQUENCY & PHASE)

1.

2. Characteristics of Active devices

- Forward and reverse characteristics of a diode - measurement of forward resistance
- Common base characteristics of a transistor - measurement of current gain, input resistance and output resistance, maximum ratings of the transistor.
- Common emitter characteristics of a transistor - measurement of current gain, input resistance and output resistance, relation between and study of the effect of leakag current, maximum ratings of the transistor.
- Common source characteristics of a JFET - measurement of transconductance g_m and
 - drain to source resistance r_{ds} , use of FET as VVR.

3. Rectifying circuits

- HW rectifier
- FW rectifier
- FW Bridge rectifier
- Filter circuits - Capacitor filter, inductor filter and Pi section filter (Measurement of ripple factor, maximum ratings of the devices)

4. Regulators – Simple zener voltage regulator, study of transistor series voltage regulator

5. RC coupled amplifier-Frequency response characteristics

6. Low frequency oscillators-RC phase shift or Wien Bridge oscillator

7. Differentiating and Integrating circuits

1. Clipping and clamping circuits

2. Astable multivibrator

Note: 50% Marks is earmarked for continuous evaluation and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.

CS/IT 308 OBJECT ORIENTED PROGRAMMING LABORATORY

Exercises to make the students understand the following concepts

- Difference between struct and class
- Data abstraction
- Data encapsulation and information hiding
- Inheritance
 - Single inheritance
 - Multiple inheritance
 - Multilevel inheritance
 - Hierarchical inheritance
- Abstract class
- Operator overloading
- Function overloading
- Over-riding
- Pointers and arrays
- Files

Note: 50% Marks is earmarked for continuous evaluation and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.