Rationale:
A technical diploma holder is engaged generally as first line supervisor. He forms a bridge between workers and management. He has to understand the language of the modern management and communicate with the workers in their language. This subject will help accomplish the task in stipulated time, develop attitude towards cost effectiveness, selection of most effective alternative methods. This course will also help the student to tackle different numerical methods and computational techniques for problem solving in research organization as a programmer.

Objective:
The course enables students to.
- Managerial skill based on mathematical footing
- The ability to find approximate solutions and/or answers to the problems where analytical methods become more complex.
- To choose correct numerical techniques for a given problem.

S.No. | Topics | Periods |
--- | --- | --- |
01 | GROUP –A (Numerical Methods & Computational Techniques) | (20) |
02 | GROUP-B (Statistical Techniques) | (20) |
03 | GROUP-C (Management Techniques) | (20) |

Total: (60) periods

CONTENTS:

GROUP-A (NUMERICAL METHODS & COMPUTATIONAL TECHNIQUES) (20)
01.01 Introduction to Numerical methods: Approximation and errors (Truncation & Round off). Floating, point presentation of numbers, arithmetic operations with normalized floating point.
01.03 Solution of Linear Simultaneous Equations: Gaussian Elimination method and Gauss-Jordan method.
01.05 Numerical Differentiation & Integration: Newton’s forward and backward differentiation formula. Trapezoidal Rule and Simpson’s 1/3 rule for numerical integration.
01.06 Numerical solution of 1st order ordinary differential equations: Taylor’s Series. Euler’s method. Modified Euler’s method Runge-Kutta methods.

GROUP-B (STATISTICAL TECHNIQUES) (20)
02.01 Introduction to statistics: Measure of central tendencies: measures of dispersions: standard deviation and variance for discrete and grouped data; assumed mean and step deviation methods.
02.03 Probability Distribution: Introduction to Arithmetic Mean and Standard Deviation of a probability distribution. Important probability distribution – Binomial distribution. Poisson’s distribution and normal distribution. Their means and variance.
02.04 Sampling Distribution: Sampling Distribution of Mean and Standard Deviation.
02.05 Quality Control: P-Chart and R-Chart.

GROUP-C (MANAGEMENT TECHNIQUES) (20)
03.01 Linear Models
03.01.01 Introduction to Operations Research (O.R) Steps of O.R.
03.01.02 Linear Programming Problems: Step in information of a LPP. Mathematical Modelling and Solution Procedure.
03.01.03 Solution by Simpex Method: Basic Feasible Solution (Degenerator and Non-degenerator) Procedure including Big-M Method. Example.
03.01.04 Transportation problem: Introduction and Solution Procedure- (i) Finding the initial basic feasible solution by N-W Corner Rule and Vogel’s Approximation Method. 
(ii) Finding the Optimal Solution by U-V Method.
03.01.05 Assignment Problem: Introduction and Solution Procedure–Fundamental theory underlying Hungarian Method.
03.01.06 Network Analysis. CPM & PERT: Introduction.
03.01.07 Basic concepts – Activities. Nodes. Edges. Networking of a project. Various times calculations. CPM to determine the optimal project schedule.
03.01.08 PERT- Definition, difference between CPM & PERT. Pessimistic times, optimistic times. Most likely times of various activities, probability of meeting the schedule time, standard deviation of the schedule time.

Books Recommended: Text Books

SCHEME OF EXAMINATION FOR FINAL EXAMINATION F.M :80
Rationale:
The subject forms an important part of Engineering curricula for developing the concepts required in the design of various structures. The subject deals with the basic concept of mechanics of body and the behaviour of material used in practice and in structures under varying load conditions. The first part of the subject deals with the applied mechanics science. Which describe the condition of body in rest or motion under the action of forces. In its preview come variety of general and specialized engineering disciplines concerned with analysis of structures and machines and the mechanism of their parts.

In the second part, the principles of strength of materials is introduced in which the student will learn to distinguish between different types of stress and strain and also the qualitative assessment of stress and strains in material element under the action of internal forces.

Objective:
Knowledge Workers will be able to:
- Analyze and understand the physical behaviour of members of engineering structures.
- Acquire knowledge of various elements of structures.
- Utilise the basic principles.
- Develop skill to tackle field problem.
- Solve the problems by the application of basic principles.
- Judge the suitability of materials in design process.

S.No. | Topics | PART-A | Periods
---|---|---|---
01 | Introduction | (02) |
02 | Vector Methods | (02) |
03 | Introduction to system of forces and equilibrium | (06) |
04 | Friction | (04) |
05 | Kinematics and kinetics of a particle | (03) |
06 | Kinematics and kinetics of rigid body | (04) |
07 | Impulse and Momentum | (02) |
08 | Work, Energy and Power | (04) |

Total: (27)

PART-B

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Topics</th>
<th>Periods</th>
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</table>
01 | Simple stress and strains | (05) |
02 | Elastic constants | (03) |
03 | Center of Gravity (Centroid) | (05) |
04 | Moment of Inertia | (05) |
05 | Shearing force and bending moments | (23) |

Total: (50)

CONTENTS:

PART-A

**TOPIC: 01 – INTRODUCTION:**
Idealisation of mechanics; Concept of rigid body; External forces (Body forces & surface forces) Law of Mechanics.

**TOPIC: 02 VECTOR METHODS:**
Equality and equivalence of vectors; Free and Bound vector; Moment of a force about a point and a line; Couple and moment of a couple; couple moment as free vector. Wrench.

**TOPIC: 03 – INTRODUCTION TO SYSTEM OF FORCES AND EQUILIBRIUM:**
Partially equivalent force system; simplest equivalent of a system of forces; force analysis, free body diagram, equation of equilibrium.

**TOPIC: 04 – FRICTION:**
Types of friction (Static, Dynamic, Sliding, Rolling, Fluid) Rope & Belt Friction etc.

**TOPIC: 05 – KINEMATICS AND KINETICS OF A PARTICLE:**
Rectilinear and curvilinear translations; normal and tangential component of acceleration; radial and transverse component of acceleration.

**TOPIC: 06 – KINEMATICS AND KINETICS OF RIGID BODY:**
Angular Velocity and angular acceleration; Effective forces on a rigid body. D’ Alembert’s principle.

**TOPIC: 07 – IMPULSE AND MOMENTUM:**
Linear impulse and linear momentum, angular impulse and angular momentum.

**TOPIC: 08 – WORK, ENERGY AND POWER:**
Work done by forces and couples, potential and kinetic energy, work-energy; conservation of energy; concept of power and efficiency.

PART-B

**TOPIC: 01 – SIMPLE STRESSES & STRAIN:**
01.01 Definition of various terms and their units (S.I. Units)
01.03 Stress & strain in varying sectional bar & composite bar. Stress & strain due to temperature variation in homogeneous and composite bars.
01.04 Shrinking on hoop’s stresses.

**TOPIC: 02 – ELASTIC STRESSES & STRAIN:**
02.01 Linear strain and lateral strain, Poisson’s ratio, volumetric strain.
02.02 Change in volume due to axial, biaxial & triaxial loading. Bulk modulus.
02.03 Shear stress and strain, modulus of rigidity.
02.04 Various relations between modulus of elasticity, modulus of rigidity & bulk modulus.
02.05 Simple shear. Complementary shear stress, stress on oblique section.

**TOPIC: 03 – CENTER OF GRAVITY (CENTROID):**
03.01 Definition of center of gravity & centroid.
03.02 Determination of C.G of various sections symmetrical and unsymmetrical sections.
03.03 Determination of C.G. of perforated sections. C.G. of semi circle, quadrant circle.

**TOPIC: 04 – MOMENT OF INERTIA:**
04.01 Definition of M.I.; radius of gyration, second moment of area.
04.02 Parallel axis theorem & perpendicular axis theorem.
04.03 Derivation of M.I. of regular area-rectangular, triangular circular about centroidal axis.
04.04 M.I. of built up section, symmetrical and unsymmetrical about centroidal axis, modulus of sections.

**TOPIC: 05 – SHEARING FORCE & BENDING MOMENT:**
05.01 Types of beams and types of supports, types of loading.
05.02 Concept and definitions of shear force and bending moment, sign convention.
05.03 Shear force and bending moment diagrams for cantilever, simply supported beam, over hanging beam for various types of loading & couples, point of contraflexure.
05.04 Relation between B.M, S.F. and rate of loading.

**Books Recommended:**

**Text Books**

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**SCHEME OF EXAMINATION FOR FINAL EXAMINATION**

F.M. : 80
Rationale:
Computers play a vital role in present day life, more so, in the professional life of technician engineers. In order to enable the students use the computers effectively in problem solving, this course offers the modern programming language C along with exposition to various engineering applications of computers.

Objective:
The objectives of this course are to make the students able to:
- Develop efficient algorithms for solving a problem.
- Use the various constructs of a programming language viz. conditional, iteration and recursion.
- Implement the algorithms in “C” language.
- Use simple data structures like arrays, stacks and linked list solving problems.
- Handling File in “C”.

S.No. | Topics | Periods
--- | --- | ---
01 | Introduction to Programming | (03)
02 | Algorithm for Problem Solving | (08)
03 | Introduction to ‘C’ Language | (06)
04 | Condition and Loops | (06)
05 | Arrays | (06)
06 | Functions | (05)
07 | Structures and Unions | (05)
08 | Pointers | (05)
09 | Self Referential Structures and Linked Lists | (03)
10 | File Processing | (03)

Total : (50)

CONTENTS:

**TOPIC: 01 – INTRODUCTION TO PROGRAMMING:**

**TOPIC: 02 – ALGORITHM FOR PROBLEM SOLVING:**
Exchanging values of two variables, summation of a set of numbers. Decimal Base to Binary Base conversion. Reversing digits of an integer, GCD (Greatest Common Division) of two numbers. Test whether a number is prime. Organize numbers in ascending order. Find square root of a number, factorial computation, Fibonacci sequence. Evaluate ‘sin x’ as sum of a series. Compute sine Series. Check whether a given number is Palindrome or not.

**TOPIC: 03 – INTRODUCTION TO ‘C’ LANGUAGE:**
03.01 Character set, Variable and Identifiers, Built-in Data Types, Variable Definition, Declaration, C Key Words-Rules & Guidelines for Naming Variables.
03.02 Arithmetic operators and Expressions, Constants and Literals, Precedence & Order of Evaluation.
03.03 Simple assignment statement. Basic input/output statement.
03.04 Simple ‘C’ programs.

**TOPIC: 04 – CONDITIONAL STATEMENTS AND LOOPS:**
04.01 Decision making within a program
04.02 Conditions, Relational Operators, Logical Perator.
04.03 If statement, it-else statement.
04.04 Loop statements
04.05 Break, Continue, Switch, Goto and Labels.

**TOPIC: 05 – ARRAYS:**
What is an Array?, Declaring an Array, Initializing an Array.
One dimensional arrays: Array manipulation: Searching, Insertion, Deletion of an element from an array; Finding the largest/smallest element in array; Two dimensional arrays, Addition/Multiplication of two matrices, Transpose of a square matrix; Null terminated strings as array of characters, Representation sparse matrices.

**TOPIC: 06 – FUNCTIONS:**
Top-down approach of problem solving. Modular programming and functions, Definition of Functions Recursion, Standard Library of C functions, Prototype of a function: Formal parameter list, Return Type, Function call, Block structure, Passing arguments to a Function: call by reference; call by value, Recursive Functions, arrays as function arguments.

**TOPIC: 07 – STRUCTURES AND UNIONS:**

**TOPIC: 08 – POINTERS:**
Concept of Pointers, Address operators, pointer type declaration, pointer assignment, pointer initialization pointer arithmetic, Indirection Operator, Pointers to Pointers, functions and pointers, Arrays and Pointers, pointer arrays.
**TOPIC: 09 – SELF REFERENTIAL STRUCTURES AND LINKED LISTS:**
Creation of a singly linked list, Traversing a linked list, Insertion into a link list, Deletion from a linked list.

**TOPIC: 10 – FILE PROCESSING:**
Concept of Files, File operation in various modes and closing of a file, Reading from file, Writing onto a file.

**Book Recommended:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Edition</th>
<th>Author(s)</th>
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**SCHEME OF EXAMINATION FOR FINAL EXAMINATION**

| F.M. | 80 |
Rationale:
The subject will help the students to learn facts, concepts, principle and procedure of digital electronics. These techniques can be used for designing sequential and combinational circuits which forms the basis of any electronic device. Also, This subject is designed to give clear idea about working principles of 8085 microprocessor.

Objective:
The objective of this subject is to enable the students to know basic concepts of digital electronics and familiarity with available chips. After undergoing this course the students will have the awareness of various arithmetic circuits, counter design, registers, A/D and D/A converters, semi-conductor memories, multiplexers and de-multiplexers etc.

S.No. | Topics | Periods
--- | --- | ---
01 | Review of Number System | (02)
02 | Logic Families and Circuits | (04)
03 | Logic Gates and Flip Flops | (04)
04 | Registers | (03)
05 | Counters | (03)
06 | Arithmetic Circuits | (04)
07 | A/D and D/A Converters | (04)
08 | Semiconductor Memories | (08)
09 | Decoders, display devices and associated circuits | (04)
10 | Multiplexers and De-multiplexers | (02)
11 | Microprocessors | (12)

Total : (50)

CONTENTS:

**TOPIC: 01 – REVIEW OF NUMBER SYSTEM:**

Decimal, binary, octal and hexadecimal number systems. Conversion from one system to another, Binary arithmetic, signed numbers. Codes-BCD, Excess-3, Gray, alphanumeric, Concept of parity and error detection & correction.

**TOPIC: 02 – LOGIC FAMILIES AND CIRCUITS:**

2.1 TTL, logic family
2.2 NAND gates
2.3 7400 and 5400 series of IC logic families: RTL, DCTL, DTL, TTL, MOS and CMOS; their characteristics and circuit configuration, tri-state logic

**TOPIC: 03 – LOGIC GATES AND FLIP FLOPS:**

3.1 Definitions, symbols and truth table of NOT, OR, AND, NAND, NOR, XOR, XNOR gates, De Morgan’s theorems; Realization of basic gates using universal gates; Realization of simple Boolean equations using universal gates, Karnaugh-map, Venn Diagram.

3.2 Logical diagram, truth table; timing diagram and operation of following latches and flip flops: NOR latch, RS, T, D, JK, Master/Slave JK flip flops, encoders, decoders.

**TOPIC: 04 – REGISTERS:**

4.1 Shift Registers
4.2 Serial in Serial out
4.3 Serial in Parallel out
4.4 Parallel in Parallel out
4.5 Parallel in Serial out
4.6 Left shift register, right shift register, universal shift register

**TOPIC: 05 – COUNTERS:**

5.1 Synchronous and Asynchronous counters
5.2 Modern counters, decade counter and its application
5.3 Ring counter and its application

**TOPIC: 06 – ARITHMETIC CIRCUITS:**

6.1 Half adder and full adder circuit, design and implementation
6.2 Half and full subtracter circuit, design and implementation
6.3 4 bit adder/subtractor

**TOPIC: 07 – A/D AND D/A CONVERTERS:**

7.1 Resistor divider D/A converter
7.2 Analog to digital conversion
7.3 Successive Approx., Method of A/D Convertors.
7.4 Dual slope integrator A/D converter
7.5 Counter type A/D converter
7.6 A/D converter specifications
TOPIC: 08 – SEMICONDUCTOR MEMORIES:
8.1 Memory Unit
8.2 Concept of memories using registers
8.3 Read only Memory (ROM)
8.4 Random Access Memory (RAM)
8.5 Static and Dynamic Memory
8.6 Programmable Array Logic (PAL)
8.7 Programmable Logic Array (PLA)
8.8 Cache Memory

TOPIC: 09 – DECODERS, DISPLAY DEVICES AND ASSOCIATED CIRCUITS:
a) LED, LCD, seven segment display, basic operation of various commonly used types
b) Four bit decoder circuits for 7 segment display and decoder/driver ICs

TOPIC: 10 – MULTIPLEXERS AND DE-MULTIPLEXERS:
Basic functions and Block diagram of MUX and DEMUX.

TOPIC: 11 – MICROPROCESSORS:
11.1 Evaluation of microprocessors, microcomputer organization, 8-bit, microprocessor-Intel 8085 architecture buses, flags and register organization, timing signals, instruction sets, addressing modes. Programming in machine and assembly languages.
11.2 Interfacing memory and I/O devices-address space partitioning, different data transfer schemes, Interfacing devices-programmable peripheral interface, interrupt controller and interval timer.
11.3 16-bit microprocessors-Intel 8086 and Motorola 68000 architecture, register organization, timing signals, instruction sets, addressing modes.

Books Recommended:
Text Books
4. Digital Electronics, Prentice Hall of India Ltd., New Delhi - Rajaraman

Reference Books:
6. Digital Computer Fundamentals, T.M.H. - Malvino
7. Digital Computer, Dhanpat Roy & Sons. - B. Ram
8. Introduction to Microprocessors, Dhanpat Roy & Sons. - Dr. B. Ram

SCHEME OF EXAMINATION FOR FINAL EXAMINATION
F.M. : 80
Rationale:
This course will enable the students to grasp the working of basic components of computer system. Further the course will help them to learn as to how the basic components interact with each other to form a working system.

Objective:
Objective of the course is to familiarize students about hardware and software design including logic design, and basic structure and behaviour of the various functional modules of the computers and how they interact to provide the processing needs of the user. This subject mainly focuses on the hardware and system software. It aims to describe the following aspects:

- Building blocks of the computer
- Computer Design
- Assembly Language Programming

S.No. | Topics | Periods
--- | --- | ---
01 | Introduction and Background | (04)
02 | Register Transfer Language and Micro-operations | (05)
03 | Architecture of a Simple Processor | (06)
04 | CPU Organization | (06)
05 | Assembly Language Programming | (07)
06 | Microprogrammed Control Unit | (07)
07 | Arithmetic Algorithms | (04)
08 | I/O Organization | (05)
09 | Memory Organization | (06)
Total: | | (50)

CONTENTS:

**TOPIC: 01 – INTRODUCTION AND BACKGROUND:**

- 01.01 Evolution of Computers
- 01.02 Stored Program concept and Von Neumann Architecture
- 01.03 Information Representation and Codes
- 01.04 Building blocks of Computers: (Combination blocks: gates, multiplexers, decoders, encoders etc., Sequential Building Blocks: Flip flops, registers, counters, random access memory etc.)

**TOPIC: 02 – REGISTER TRANSFER LANGUAGE AND MICRO-OPERATIONS:**

- 02.01 Concept of bus, Data movement among registers.
- 02.02 A language to represent conditional data transfer
- 02.03 Data movement from/to memory
- 02.04 Arithmetic and logical operations along with register transfer
- 02.05 Timing in register transfer

**TOPIC: 03 – ARCHITECTURE OF SIMPLE PROCESSOR:**

- 03.01 A simple computer organization and Instruction set.
- 03.02 Instruction execution in terms of microinstructions
- 03.03 Concept of Interrupt and simple I/O organisation
- 03.04 Implementation of the processor using building blocks

**TOPIC: 04 – CPU ORGANISATION:**

- 04.01 Address modes Instruction formats.
- 04.02 Instruction formats
- 04.03 CPU organisation with large registers
- 04.04 Stacks and handling of interrupts and subroutines
- 04.05 Instruction pipelining : stages, hazards and methods to remove hazards

**TOPIC: 05 – ASSEMBLY LANGUAGE PROGRAMMING:**

- 05.01 Machine and Assembly language.
- 05.02 Pseudo-Operations
- 05.03 Subroutines in assembly language
- 05.04 Interrupt and I/O Programming
- 05.05 Examples

**TOPIC: 06 – MICROPROGRAMMED CONTROL UNIT:**

- 06.01 Basic organization of microprogrammed controller.
- 06.02 Horizontal and vertical formats
- 06.03 Address sequencer

**TOPIC: 07 – ARITHMETIC ALGORITHMS:**

- 07.01 Addition and Subtraction for sign magnitude and 2’s complement numbers.
- 07.02 Integer multiplication using shift and add
- 07.03 Booth’s algorithm
- 07.04 Integer Division
- 07.05 Floating point representations and arithmetic algorithms
TOPIC: 08 – I/O ORGANISATION: [ 05 ]
08.01 Strobe based and handshake based communication.
08.02 Vector and priority interrupts
08.03 DMA based data transfer

TOPIC: 09 – MEMORY ORGANISATION: [ 06 ]
09.01 Basic cell of static & dynamic RAM.
09.02 Building large memories using chips
09.03 Associative memory
09.04 Cache memory organisation
09.05 Virtual memory organisation

Books Recommended:

Text Books

Reference Books:

SCHEME OF EXAMINATION FOR FINAL EXAMINATION  F.M. : 80
DATA STRUCTURE USING C

Subject Code
08206

<table>
<thead>
<tr>
<th>No. of Periods Per Week</th>
<th>Theory</th>
<th>No of Period in one session : 150</th>
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Rationale:
Data Structure is a subject which deals with data and their structures. In system programming, application programming, the method and techniques of data structures are widely used. This study of data structure helps the students in developing a logic & structured programs.

Objective:
After completion of this course student will be able to :

- Understand and use the process of abstraction using a programming language such as 'C'.
- Analyze step by step and develop algorithm to solve real world problems.
- Implementing various data structures viz. Stacks, Queues, Linked Lists, Trees and Graphs.
- Understanding various searching & sorting techniques.

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<tr>
<th>S.No.</th>
<th>Topics</th>
<th>Periods</th>
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<tbody>
<tr>
<td>01</td>
<td>Basic concepts of data representation</td>
<td>(03)</td>
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<tr>
<td>02</td>
<td>Introduction to Algorithm Design and Data Structure</td>
<td>(05)</td>
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<td>03</td>
<td>Arrays</td>
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<td>04</td>
<td>Stacks and Queues</td>
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<td>05</td>
<td>Linked lists</td>
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<td>Trees</td>
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<td>07</td>
<td>Searching, sorting and complexity</td>
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CONTENTS:

**TOPIC: 01 – BASIC CONCEPTS OF DATA REPRESENTATION:**
Abstracting data types: Fundamental and derived data types. Representation, primitive data structures.

**TOPIC: 02 – INTRODUCTION TO ALGORITHM DESIGN AND DATA STRUCTURES:**
Design and analysis of algorithm: Algorithm definition, comparison of algorithms, Top-down and bottom up approaches to Algorithm design, Analysis of Algorithm; Frequency count, Complexity measures in terms of time and space. Structured approach to programming.

**TOPIC: 03 – ARRAYS:**

**TOPIC: 04 – STACKS AND QUEUES:**
Representation of stacks and queues using arrays and linked-lists. Circular queues, Priority Queue and D-Queue. Applications of stacks: Conversion from infix to postfix and prefix expressions, Evaluation of postfix expression using stacks.

**TOPIC: 05 – LINKED LISTS:**

**TOPIC: 06 – TREES:**

**TOPIC: 07 – SEARCHING, SORTING AND COMPLEXITY:**
Searching: Sequential and binary searches, Indexed search, Hashing Schemes.
Sorting: Insertion, selection, bubble, Quick, merge, radix, Shell, Heap sort.

**TOPIC: 08 – GRAPHS:**
Graphs representation: Adjacency matrix, Adjancy lists, Adjacency Multicasts.

Implementation of Strategies:
To implement the methods of data structure, C is found to be appropriate language. The student/teacher has to study/teach data structures and their methods using C.
### Books Recommended:

<table>
<thead>
<tr>
<th></th>
<th>Title</th>
<th>Edition, Publisher</th>
<th>Authors</th>
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<tr>
<td>4</td>
<td>Data Structures, Algorithms and Object Oriented Programming, First</td>
<td>- G. L. Heileman</td>
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</table>

### SCHEME OF EXAMINATION FOR FINAL EXAMINATION

| F.M. | 80 |

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11
Rationale:
For the design of an Information System, it is important to understand the requirements, carry out system study and analyze information. After undergoing this Course, the student will be able to study, analyze and design a system for the user.

Objective:
The Course focuses on the following aspects of Information System Development:
- Study, Analysis and Design of a System
- Documenting and evaluating the System
- Data Modelling
- Developing Information Management System for an Organisation
- Implementing and Testing

S.No. Topics Periods
01 Introduction (03)
02 System Analyst (01)
03 System Development Cycle (03)
04 System Planning (05)
05 Modular and Structured Design (03)
06 System Design and Modelling (10)
07 Input and Output (06)
08 System Implementation and Maintenance (03)
09 Computer System Audit and Security (02)
10 OO Analysis/ Design (08)
11 Introduction to Management Information System (06)
Total: (50)

CONTENTS:

TOPIC: 01 – INTRODUCTION:

TOPIC: 02 – SYSTEMS ANALYST:
Role and Need of Systems Analyst. Qualifications and responsibilities. System Analysis as a Profession.

TOPIC: 03 – SYSTEM DEVELOPMENT CYCLE:

TOPIC: 04 – SYSTEM PLANNING:

TOPIC: 05 – MODULAR AND STRUCTURED DESIGN:
Module specifications, Top-down and bottom-up design. Module coupling and cohesion. Structure Charts.

TOPIC: 06 – SYSTEM DESIGN AND MODELLING:
Process Modelling, Logical and physical design, Conceptual Data Modelling: Entity-Relationship Analysis, Entity-Relationship Modelling, ERDs and DFDs, Concepts of Normalization. Process Description: Structured English, Decision Tree, Decision Tables. Documentation: Data Dictionary, Recording Data Descriptions.

TOPIC: 07 – INPUT AND OUTPUT:

TOPIC: 08 – SYSTEM IMPLEMENTATION AND MAINTENANCE:

TOPIC: 09 – COMPUTER SYSTEM AUDIT AND SECURITY:

TOPIC: 10 – OO ANALYSIS/ DESIGN:
TOPIC: 11– INTRODUCTION TO MANAGEMENT INFORMATION SYSTEM (MIS):


Books Recommended:

Text Books

Reference Books:

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 80
DATABASE MANAGEMENT SYSTEM

<table>
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Rationale:
This subject will allow students to develop understanding of the basic concepts of data in general and Relational Database System in particular. The students will learn Database concept, Data Structure, Data Models, various approaches to Database design, strengths of relational model, Normalization.

Objective:
At the end of the course the student will be able to:
- Develop Database System to handle the real world problem.
- Understand Database design and normalization techniques.
- Use Standard Query Language and its various versions.
- Understand Importance

S.No. | Topics                                                                 | Periods |
-------|------------------------------------------------------------------------|--------|
01     | Introduction to Database Systems(DBMS)                                 | (03)   |
02     | Database Architecture and Modelling                                    | (03)   |
03     | Entity Relationship Model                                              | (02)   |
04     | Relational Model                                                      | (03)   |
05     | Relational Algebra and Relational Calculus                            | (05)   |
06     | Introduction to SQL                                                   | (12)   |
07     | Database Normalization                                                | (05)   |
08     | Backup and Recovery                                                   | (05)   |
09     | Database Security and Integrity                                       | (03)   |
10     | Design and Development of Database Applications on Commercial RDBMS Platforms | (09)   |
Total  |                                                                      | (50)   |

CONTENTS:

**TOPIC: 01 – INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS (DBMS):**
Why Database, Characteristics of Data in Database, DBMS, What is database Advantage of DBMS

**TOPIC: 02 – DATABASE ARCHITECTURE AND MODELLING:**
Conceptual, physical and logical database models, Role of DBA, Database Design

**TOPIC: 03 – ENTITY RELATIONSHIP MODEL:**
Components of ER Model, ER Modelling Symbols, Super Class and Sub Class types. Attribute Inheritance. Specialization, Generalization, Categorization.

**TOPIC: 04 – RELATIONAL DBMS:**
Introduction to Relational DBMS. RDBMS Terminology.

**TOPIC: 05 – RELATIONAL ALGEBRA AND RELATIONAL CALCULUS:**
Relational Algebraic operations, Tuple Relational Calculus, Domain Relational Calculus

**TOPIC: 06 – INTRODUCTION TO SQL:**

**TOPIC: 07 – DATABASE NORMALISATION:**
Keys, Relationships, First Normal Form, Functional dependencies, Second Normal Form, Third Normal Form, Boyce-Codd Normal Form, Fourth Normal Form, Fifth Normal Form, Case Study

**TOPIC: 08 – BACK UP AND RECOVERY:**

**TOPIC: 09 – DATABASE SECURITY AND INTEGRITY:**

**TOPIC: 10 – DESIGN AND DEVELOPMENT OF DATABASE APPLICATIONS ON COMMERCIAL RDBMS PLATFORMS:**
Student is expected to achieve a level of competence in at least one of the standard commercial RDBMS products under desktop or multi-user environment to be able to develop a small to medium application; the student must also acquire skills for independently designing on-line database applications. The skills required for design and developments are; Database design. Applications design. SQL. Embedded SQL. Trouble-shooting. Performance tuning and documentation.

In application design, focus should be on on-line applications in database environments; the students should get sufficient insight into issues in menu design, screen design, data validations in data entry screens, report designs and an overview of GUI design. These skills must be demonstrated through the course project including the project report and viva-voce.

Concepts of DBMS will be implemented by using the popular relational DBMS package such as ORACLE/ MS-SQL.
Books Recommended:

**Text Books**

**Reference Books**
2. An Introduction to Database Systems, Galgotia Publication - B. Desai

**SCHEME OF EXAMINATION FOR FINAL EXAMINATION**

<table>
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<tr>
<th>Subject</th>
<th>Credits</th>
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<tr>
<td>F.M.</td>
<td>80</td>
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Rationale & Objective:
This course will enable the students to familiarize with the features and use of application packages such as Word Processing Package (MS-Word), Spreadsheet Package (MS-Excel), Presentation Packages (MS-Power Point), Data Base Management Package (Visual Fox Pro) and Anti-virus Packages.

CONTENTS:

TOPIC: 01 – WORD PROCESSING PACKAGE (MS-WORD):
01.01 Features of Word Processing Package MS-Word, Menu Options-File, Edit, View, Insert, Format, Tools-spelling and grammar, language, mail-merge, options; table. (12)
01.02 Creating, editing and saving a document, Opening a document, password protection for file. (12)
01.03 Setting page margins, tab setting, ruler and indenting.
01.04 Formatting a document- using different fonts; changing font size and colour; changing the appearance through bold/italic/underline; highlighting text; change case; use of sub script and superscript.
01.05 Alignment of text in a document and justification, use of bullets and numbering.
01.06 Paragraph formatting, inserting page breaks and column breaks.
01.07 Use of headers, footers, footnote and end note. Use of Comments, inserting date, time, and special symbols, importing graphical images and use of drawing tools.
01.08 Creating table, formatting cells, using different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting a row/column in a table.
01.09 Print preview, zoom, page setup, print options.
01.10 Use of tools such as spell checker, help, mail-merge, and use of macros.

TOPIC: 02 – SPREADSHEET PACKAGE (MS-EXCEL):
02.01 Features of Spreadsheet package such as MS Excel, Menu Options- File; edit; view; insert; format; tools-spelling, auto correct, protection, options; data. (12)
02.02 Concepts of cell and cell-addressing.
02.03 Creating, operating and saving worksheet.
02.04 Entering text, numeric information and formula
02.05 Formatting numbers and text, protection cells, printing worksheet.
02.06 Using data management functions-mathematical, statistical and financial functions.
02.07 Creating different types of charts, graphs and balance worksheet and displaying 3-D Charts, printing and resizing charts.
02.08 Importing files and graphics.

TOPIC: 03 – PRESENTATION PACKAGE (MS-POWER POINT):
03.01 Features of Presentation Package MS-Power Point, Menu options-File; edit; view; insert; format; tools-spelling, language, auto clipart, slide show (10)
03.02 Status bar, tool bar, customized tool bar, slide view, outline view, slide sorter view, notes page view, slide show view
03.03 Creating and saving slides, opening and editing slides, changing layout of a slide, deleting of slide, changing layouts of a slide, deleting of slide, Changing the order of slides, animation.
03.04 Working with objects: selecting, grouping, ungrouping and regrouping of objects, Moving, aligning, cutting, copying, pasting, and duplicating objects.
03.05 Putting text on slides: selecting and editing text, finding and replacing text.
03.06 Creating graphs and importing files.
03.07 Creating tables.
03.08 Use of data sheet view and design view.
03.09 Writing queries and viewing results/
03.10 Filtering data.
03.11 Creating reports.

TOPIC: 04 – DATA BASE MANAGEMENT PACKAGE (VISUAL FOXPRO):
04.01 Introduction to Visual FoxPro: The menu system, File Types, The Toolbars, Visual Design and Wizards, The Command Window and the View Window, Other features of Visual Fox Pro Interface. (14)
04.02 Tables in Visual FoxPro: Creating a New Table, Table Wizard, Using Table Designer, Using Tables, Opening a table, Working on a table, Modifying a table.
04.03 Managing Data: Switching from Browse to Edit display, Entering and Editing Data, Appending data, Moving through a Table, Go To Record command, Find and Replace, Deleting a Record, Altering the Display of the Browse Window.
04.04 Using Queries: Creating a Query, Query Wizard, Query Designer, Running the Query, Using the Query, the Cross Tab Wizard, Modifying the Query, the Query Designer.
04.05 Using Forms: AutoForms, the Form Wizard, Choosing Fields, Choosing Fields, Choosing a Style, Choosing Sort Order, Generating the Form, Using Forms, Running a Form, Using the Form’s Control Panel.

Working from the Command Window: Using the Command Window, Creating a new table, Modifying the structure of the table, Displaying and Editing the data, Deleting and Replacing the records, Using commands: RUN, SET DEFAULT, DISPLAY, LIST, ?, Using logical expressions, logical functions, Relational Operators, Logical Operators, IIF() function, Sorting a table, Creating Indexes, Setting the index order, Re indexing, Filtering data, Use of Macro (&) command, Data Functions, Use of multiple tables.

Working with Relational Databases in Visual FoxPro: Concepts of relational databases, Entering and Viewing data using the Form Wizard, Query Wizard to work with Relational databases, Using one-to-many Report Wizard, Using the view Window, Using Queries and SQL Queries versus Views, The Query designer, Working with multiple tables, Directing output, Viewing SQL code, Maximizing the Table View, Running the Query. One-to-many and Many-to-one Queries, Filtered Joins, a grouped Query, The SQL SELECT command, Other SQL commands, Using Visual FoxPro databases.

Visual FoxPro Utilities: Importing and Exporting data using Import Wizard, Editing text, Edit menu, Format menu, Spelling tool, Objective Linking and Embedding, Programming and developing applications using Visual FoxPro. An overview of programming, Creating files, Running the program, input/output, Variables, Simple output using '?' Command, Getting input from the User, @......Say...Get command, Picture clauses, Control flow, Looping Selection, EXIT and LOOP, Procedures and Parameters, scope of Variables and Passing the Project Manager, Techniques of writing efficient FoxPro programming codes.

TOPIC: 05 – ANTI VIRUS PACKAGES:

05.01 Introduction to Virus.
05.02 Understanding features of and use of Norton Utilities.
05.03 Virus Protection, Deletion & Removal Utilities
05.04 Using Anti Virus Packages such as NAV, inoculate and Macaffe
05.05 Anti Virus Packages to prevent, detect & delete Viruses.

Books Recommended:

- MS office 2000 for Everyone, Vikash Publications, New Delhi - Sanjay Saxena
- MS office 2000, Addison Wesley(Singapore) Pvt. Ltd., New Delhi - Sagman
- MS office 2000 8-in-1, Prentice Hall of India, New Delhi - Habraken
- MS office, BPB Publications, New Delhi - Ron Mansfield
- A Quick Course in Power Point and A Quick Course for Windows, Galgotia Publications Pvt. Ltd., Daryaganj New Delhi. - Cox
- FoxPro 2.6 code Book, BPB Publication, 1994 - Griver
- Mastering FoxPro 2.5, BPB Publication, 1994 - Siegel
- FoxPro 2.6 for Dummies, Pustak Mahal - Dan Gookin
- Understanding Norton Utilities - Peter Dysen

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 80
## Operating System

### Rationale:
The course provides the students with an understanding of human computer interface existing in computer system and the basic concepts of operating system and its working. Further, good working knowledge to work in Windows and Unix environments is provided by this course.

### Objective:
The objectives of this course are to make the students able to
- To teach the requirement of Operating System in Computers.
- To teach Windows Operating System and to make familiar with special features of Windows Operating System.
- To teach multi-user Operating System Unix Operating System and Unix File Structure.

### CONTENTS:

#### TOPIC: 01 – INTRODUCTION:

#### TOPIC: 02 – PROCESSES:

#### TOPIC: 03 – INTERPROCESS COMMUNICATION AND SYNCHRONIZATION:
The need for inter process synchronization, mutual exclusion, semaphores, Hardware support for mutual exclusion, Queuing implementation of semaphores, Classical Problems in concurrent programming, Critical region and conditional critical region, monitors, messages, deadlocks.

#### TOPIC: 04 – MEMORY MANAGEMENT:
- **04.01 Contiguous Allocation**: Single Process Monitor, Partitioned memory allocation static, Partitioned memory allocation-Dynamic, segmentation
- **04.02 Noncontiguous Allocation**: Paging, Virtual Memory(allocation policies and replacement policies)

#### TOPIC: 05 –FILE MANAGEMENT:
Command Language user’s view of the file system disk organization, disk controller and driver, operating system’s view of file management, disk caches and Unix Buffer Cache, A generalization of file services.
TOPIC: 06 – SECURITY AND PROTECTION:
Security threats and goals, penetration, attempts, security policies and mechanisms, authentication, protection and access control, formal models of protection, cryptography, worms and viruses.

TOPIC: 07 – MULTI PROCESSOR SYSTEMS:
Motivation and classification, multi processor interconnection, types of multi processor operating system, multi processor OS functions and requirements, introduction of parallel computing, multi processor synchronization.

TOPIC: 08 – DISTRIBUTED OPERATING SYSTEM: ALGORITHM
Rational for distributed systems, computer networks algorithms for distributed processing, coping with failures.

TOPIC: 09 – PERFORMANCE MEASUREMENT, MONITORING AND EVALUATION:
Introduction, important trends affecting performance issues, why performance monitoring and evaluation are needed, performance measures, evaluation techniques, bottlenecks and saturation, feedback loops.

TOPIC: 10 – CASE STUDY:

10.01 WINDOWS OPERATING SYSTEM
A brief history of Windows, Graphical User Interface(GUI), Start windows, starting and quitting a program, opening a document, use of help feature, starting a program by using RUN command, shutting down computer, maximize, minimize and close windows, organizing files and folder using explorer move or copy of file of folder, delete a file or folder, create a new folder, copy a file to floppy disk.
Difference in windows 95, 98 and 2000.
Working with documents: changing, moving, deleting and saving information.
Printing: setting up a printer, printing a document
Brief introduction to windows accessories like notepad, calculator.

10.02 UNIX OPERATING SYSTEM
Introduction to Unix Operating System. Unix features & Benefits :-
Introduction to Unix:- Systems characteristics and requirements with Unix.
Getting Started:- System manager, Password, Log in, Log out, running the system.
File in the Unix System:- File structure in Unix, Working with file structures, removable file volumes.
Unix Command Shells:- Issuing commands, Input handling by the shells, The shell programming language, Running the Unix shells, Pipes, Version of Unix Systems.
The System Kernel:- Nature of the Kernel, Process Co-ordinations and Management, Input and Output Operations.
Facilities and Utilities:- Communications, File Management, Other General Utilities.
Editing With vi and ed editors:- Text editors, using the vi text editor, Local Commands, Range Commands, Global Commands in vi, Using ex command from vi, Cutomizing vi, The ed line editor.
Text Preparation and Processing:- Tools and facilities, The ‘hroff’ text Formatter, Using hroff to advantage, Other text formatting programs, Spelling and Typographic errors, Styles and dictions.
Languages and Compilers:- Fortran 77, The C-Language, Compiling assembling and loading, Berkley Pascal, BASIC, Assembler language Programming

Books Recommended:
5. Microsoft Windows Manual - Sanjay Saxena
7. WWW.msn.com and linked sites -

SCHEME OF EXAMINATION FOR FINAL EXAMINATION
F.M. : 80
ENGINEERING MECHANICS Lab.

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Rationale & Objectives:
The Engineering Mechanics Laboratory is a subject which will help technician to understand the application of theory that he has studied in practice by performing experiments and verifying results.
Besides the above the objective of the curriculum with effective skill will be developed in them to observe experimental data, and to analyses the results.
These topics of this curriculum will certainly build their confidence in performing the utilization of principle of mechanics in Civil Engineering works.

CONTENTS:
Eight experiments to be performed in the laboratory:

1. Determination of elongation of wire under external load.
2. Tensile Test on mild steel specimen.
3. Tensile Test on high tensile specimen.
4. Compression Test on metal.
5. Compression Test on bricks.
7. Determination of reaction at the support of beam.
8. Determination of bending moment of a simply supported beam.
9. Determination of reaction at the support of roof truss.
10. Determination of deflection of beams.
12. Determination of bending moment of a over hanging beam.
13. Verification of Polygon Law of forces.
14. Verification of Triangle Law of forces.
15. To find moment of inertia of fly wheel.
16. Compression Test on metal.
17. Tensile Test on M.S.specimen.
18. Determination of co-efficient of friction on inclined plane.

Books Recommended:

Text Books


SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 40
CONTENTS:

List of Practicals:
1. Programming exercise on executing a C program.
2. Programming exercise on editing C program.
3. Programming exercise on defining variables and assigning values to variable.
4. Programming exercise on arithmetic and relational operations.
5. Programming exercise on arithmetic expressions and their evaluation.
6. Programming on infix, postfix, transformation using stack.
7. Programs on insertion, deletion on link list.

Books Recommended:

SCHEME OF EXAMINATION FOR FINAL EXAMINATION
F.M. : 40
COMPUTER ORGANISATION & ARCHITECTURE

Subject Code
08213

Practical

<table>
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<td>80</td>
<td>20</td>
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List of Practicals:

01. Write a program in C-language to implement the digital gates. The program should give the truth table of the gate, which is selected by the user from the menu displayed by the program.

02. Write a program in C-language to implement division algorithm.

03. Write a program in C-language to generate the r's and (r-1)'s complement for a number given in any number system r.

04. Give the presentation on 74xx series IC for gates.

05. Give the presentation on combinational circuits such as multiplexer, decoder, encoder etc.

06. Give the presentation on sequential circuits such as registers, counters etc.

07. Give the presentation on the flip-flops i.e. RS-flip-flop, D-flip-flop, JK-flip-flop, T-flip-flop, Master-Slave JK-flip-flop etc.

08. Give the presentation on Von Neumann Architecture of a computer system.

09. Give the presentation on money management i.e. virtual memory, cache memory, paging etc.

10. Write an assembly language program to find the largest integer from maximum of 15 numbers stored at NUM, defined as consecutive words. The end of the sequence of number is denoted by -9999.

11. Write an assembly language program to covert the binary number into hexadecimal number.

12. Write an assembly language program to convert binary number to decimal number.

13. Write an assembly language program to add two 8-bits numbers in the memory location called NUM1 and NUM2. The result is stored in the memory location called RESULT. If there was a carry from the addition it will be stored as 0000001 in location called CARRY.

14. Write an assembly language program to exchange the data between two variables.

15. Write an assembly language program, which count the frequency of each decimal digit 0 to 9 of the segment of digits available at DIGIT. The sequence is terminated by character #. Put the frequency of 0 to 9 at FREE in ten consecutive words.

16. Write an assembly language program to convert the lower alphabet character after full stop to capital letter if it is a small letter in the string available at MSG.

17. Write an assembly language program to multiply the two unsigned binary numbers.

18. Write an assembly language program to find the smallest integer from maximum of 15 numbers stored at NUM, defined as consecutive words. The end of the sequence of number is denoted by -9999.

19. Write an assembly language program to count the number of spaces character and words in the string available at MSG.

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 40
LIST OF PRACTICALS:

S.No. Experiment
1 Hands on experience on any RDBMS to implement the role of Database Administrator like creating the users, alter user, grant and revoke of rights of user.
2 Create a Database of employees and departments with the following details.
   Table name: fields name
   Emp: empno(primary key), ename,
       Edetails, ebasic, salary-
       Details, c-deptno(foreign key)
   Dept: deptno(primary key), dept-name, dept. Details.

Create suitable tables to perform the following relational operations

- select
- product
- join
- restriction
- union
- intersection
- difference

Perform the following data manipulation operation on table created in Problem 2

(a) insertion of records
(b) deletion of records
(c) Updating records

For the table created in problem 2 perform the following SQL constructs

- a. SELECT……FROM….WHERE……GROUP BY ….. HAVING ….. ORDER BY…..
- Create views, temporary tables and perform nested queries on the table created in problem2.

Develop a small application using Visual basic as front end and Oracle SQL as backened using ODBC connectively

- Creation and modification of databases through ER diagram, normalisation
- Creation, updation, insertion and deletion of tables

Writing queries on tables, PL-SQL programming and event driven programming

Creating forms and using them

Creating reports

Teachers can take DBMS Lab topics such as the following:- Personal/Bank/Library/ Hostel Accounting / Insurance /Budget /Preparing Highest Cricket Score/Class Marks Management/Admission Merit List/Income Tax Calculation/Books Publisher database/Preparation of Salary of a Govt. organization employee etc.

Books Recommended:

1. Introduction to Database Systems, Addison Wesley(Singapore) Pvt. Ltd., New Delhi - C.J. Date
3. Relational Database Management Systems, Theory & Practice - Val Occardi
5. Database System - Silver Schutz
6. Relational Database Management System by - ATF, H. Wiley
8. Database Management - C.J. Date, Addison Wesley
9. SQL in 21 days - B.P.B.
10. ORACLE, SQL & PL/SQ – Handbook - Philsinski-Person
11. SQL Bible - Alof Kriegel, Boris M. Trukhnov

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 40
INTRODUCTION TO SOFTWARE PACKAGES

<table>
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LIST OF PRACTICALS:
1. Using mail merge of MS-Word prepare send new year greetings to all Principal, staffs and students of your institution.
2. Demonstrate the different tools of the MS-Word.
3. Using MS-Excel prepare monthly salary payment of your institution. For calculating use mathematical, statistical and financial functions of MS-Excel.
4. Using MS-Excel Prepare Pie and bar chart to show current branchwise and batchwise status of students, passouts, fails for last five years.
5. Using MS-Powerpoint Prepare a power point presentation of last year annual activities of your polytechnic.
6. Using MS-Powerpoint Prepare a power point presentation on current scientific research based on direction of your teacher.
7. Using Foxpro prepare a ranking list of last final year passout students of your institution.
8. Using Foxpro prepare list of topper of all branches and also prepare topers of each subjects of all branches of your institution of last final year passout of your institution. Also prepare average marks in each subject of your institution.
9. Prepare a Project Report on definition, types, and history of viruses and antivirus virus packages to fight with viruses.
10. Demonstrate functions of Norton Utilities and how will you protect your computer from viruses. Also demonstrate how will prevent, detect and delete viruses from your system and floppy diskette.

Books Recommended:
1. MS Office 2000 for Everyone, Vikash Publications, New Delhi - Sanjay Saxena
2. MS Office 2000, Addison Wesley(Singapore) Pvt. Ltd., New Delhi - Sagman
3. MS Office 2000 8-in-1, Prentice Hall of India, New Delhi - Habraken
4. MS Office, BPB Publications, New Delhi - Ron Mansfield
10. Mastering FoxPro 2.5, BPB Publication, 1994 - Siegel
11. FoxPro 2.6 for Dummies, Pustak Mahal - Dan Gookin
12. Understanding Norton Utilities - Peter Dysen

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 80
LIST OF SESSIONALS:

1. Study of 4 bit up counter
2. Study of 4 bit down counter
3. Study of 4 bit synchronous counter
4. Study of decade counter
5. Study of serial in serial out register
6. Study of serial in parallel out register
7. Study of parallel in serial out register
8. Study of parallel in parallel out register
9. Study of D/A converter
10. Study of A/D converters
12. Study of display devices and their drivers. LED and LCD drivers, IC's 7447, 7448
13. Study of half and full adders
14. Study of Intel 8085 microprocessor
15. Assembly language Programming with Intel 8085, 8086

Books Recommended:

Text Books:
4. Digital Electronics, Prentice Hall of India Ltd., New Delhi - Rajaraman

Reference Books:
DATA STRUCTURE USING C

Subject Code
08217

Sessional
No. of Periods Per Week
Full Marks
L T P/S Annual Exam. : 50
0 0 02 Internal Exam. : 20

Contents:

Problems based on topics taught in Theory classes as per instruction and guidance of the teacher concerned.

01 Write a program to create singly linked list, and perform insertion, deletion and updation of items of the list.
02 Write a program, for creating of priority queues.
03 Write a program to create Stack using linked list and arrays, and perform push and pop operation on it.
04 Write a program to convert infix expression into postfix expression.
05 Write a program to evaluate polynomial addition and substraction.
06 Write a recursive procedure to implement Towers of Hanoi problem for ‘n’ number of disk.
07 Write a program for following sorting algorithms:-
   (a) Selection Sort
   (b) Insertion Sort
   (c) Merge Sort
08 Write programs for following searching algorithms:-
   (a) Binary & Linear Search
   (b) Breadth First Search
   (c) Depth First Search
09 Write a program to find Inorder, Preorder and Postorder traversal of tree.
10 Write a Program to find minimum spanning tree.

Total :

Books Recommended:

Text Books

Reference Books:

26
LIST OF SESSIONALS:

S.No. | Topics | Periods
--- | --- | ---
01 | Construct an ER diagram for a bank database that shows the basic relationship among customers, checking account, saving account, loans and bank branches where various accounts and loans are taken out. You also want to keep track of transactions on accounts and loans and maintain the current balance in each account and balance on loan. Remember that each entity in ER diagram represent a simple file of data of which you want to keep track. Construct DFD showing the functional view of the system. | 02
02 | Construct an ER diagram for a car insurance database that includes data about customers (car owners), cars, accidents, drivers involved in accident, and injured driver and/or passenger. Note that any customer can insure many cars, each car may have different drivers at different times, and accidents typically involve one or more cars. Convert this into DFD. | 02
03 | There is a business that owns a softball complex. It organizes league and tournament play over several seasons per year. The people associated with this business are represented as players or employees. An employee may also be a player. Most of these people play for teams that compose the leagues of this organization. These teams are not allowed to register into multiple leagues. Each season consists of several leagues and teams, with each team playing several games each season. Once a team and league have entered the organization, they are invited to participate in each season thereafter. Construct ER and DFD for same. | 02
04 | A clinic is in the business of providing dental services to the patient. A number of doctors are on rolls of the clinic. Patients can take the appointments on the phone or personally for a particular doctor and particular services. Clinic sends reminders to patient and appointment schedule to the doctor one day in advance. At due date and time the patient performs the visit for the appointment to get the services performed on him. At the time of performing services doctor asks the clinic for patient’s last record (if any) and what ever services he has performed and informs the clinic so that the records can be updated. | 02
05 | Draw DFD for order processing system. | 02
06 | Draw DFD for making auto loans. | 02
07 | An international airlines initiated a policy for a traveler. The information is as follows:- Passengers who fly more than 10,000 miles per calendar year and pay cash and have been flying for last 5 years, the get concession of free round trip ticket. Otherwise traveler is not entitled for round trip ticket. (a) Draw suitable decision trees for the above. (b) Draw decision table for the above. | 02
08 | Consider a marketing based system. Analyze strategic, managerial and operational trends. Assign various tasks to entities like product, customer, city and departments. Draw also DFD for the above. | 02
09 | Take hospital management system. Explain PCR (Parent Child Relationship) in Hierarchical/relational DBMS. Create a data dictionary for the same. | 02
10 | What are the different threats to system security (in view of information system) like virus, data processing errors, employee errors, telephone fraud, hacking, software piracy, violations, natural disaster, bugs and worms? | 02

Total:

Books Recommended:

2. System Analysis - Fitzgerald
3. Project Management, Tata Mcgraw Hill, New Delhi. - Chaudhary
5. Projects-Presentation, Appraisal, Budgeting and Implementation, Tata Mcgraw Hill, New Delhi. - Prasanna Chandra
LIST OF SESSIONALS:

1. Demonstrate giving brief history of Operating System, types of Operating Systems in use these days, how it is necessary for a computer functioning.
2. Prepare a report on different views of the Operating System, the journey of a command execution, Design and implementation of Operating System.
5. Demonstrate the Security and Protection features of an Operating System.
6. Demonstrate the functions of Multi Processor Systems.
7. Demonstrate and produce report on computer network algorithms for distributed processing.
8. Prepare a brief history of Windows Operating System.
9. Demonstrate features, tools and accessories of Windows 98.

Books Recommended:

5. Microsoft Windows Manual -
7. WWW.msn.com and linked sites -
8. Unix Programming - Bach