



VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

S. Y. B.Sc. Computer Science

ENGLISH (Higher Level)

	Text-1 The Threshold -Macmillan
1	PART I SHORT STORIES
	1.1 The Gift of The Magi 1.2 A Duel 1.3 Nitya 1.4 The Fatalist 1.5 The Child
2	PART II ESSAYS
	2.1 MY Financial Career 2.2 Principles of Good Writing 2.3 The Elixir of Life
3	PART III Poetry
	3.1 The World is Too Much With Us 3.2 A Bird Came Down The Walk 3.3 Stopping by Woods On a Snowy Evening 3.4 Palanquin-Bearers
4	GRAMMAR 4.1 Voice, Narration 4.2 Sentence-Structure 4.3 Parts of speech-Nouns 4.4 Parts of Speech-Pronouns, Determiners, Articles etc. 4.5 Parts of speech-Verbs 4.6 Parts of speech-Adjectives, Adverb, Intensifiers 4.7 Parts of speech-Preposition, Conjunction, Interjection 4.8 Phrases 4.9 Clause 4.10 Type of Sentences 4.11 Pronunciation

Mathematical Methods (IDS)

Unit No.	Topic
1	Solution of Algebraic and transcended equations 1.1 Bisection method, 1.2 Method of False Position 1.3 Newton Raphson method 1.4 Iteration method.
2	Interpolation 2.1 Finite differences 2.2 Forward & Backward differences 2.3 Divided differences, Newton's formula for forward, backward and divided differences 2.4 Lagrange's formula.
3	Solutions of linear system of equations 3.1 Gauss-Elimination method 3.2 Gauss-Jordan method 3.3 Modified Gauss method 3.4 Gauss-Seidel method.
4	Mathematical Modeling : 4.1 Formulation of models 4.2 Malthusian and Logistic laws of population model 4.3 Model for spread of technological innovations 4.4 Models for diffusion of Glucose or Medicine in the blood stream.

Statistical Methods (IDS)

Unit No.	Topic
1	Statistics 1.1 Definition. 1.2 Limitations and Functions of Statistics.
2	Random Variable 2.1 Discrete Data 2.2 Moments 2.3 Moment generating function 2.4 Expected values { with theorem}
3	3.1 Probability (Definition) 3.2 Addition Theorem, 3.3 Bayes theorem 3.4 Short examples.
4	Distribution 4.1 Binomial 4.1 Poission {Mean, Variance, Moment generating Function & Example}
5	Application 5.1 t, F, chi square distributions 5.2 Sampling distribution(Definition).
6	6.1 Measures of central tendency and distribution{ Mean, Mode, Median, Harmonic Mean, Geometric Mean & Examples} 6.2 Measures of dispersion 6.2.1 Range 6.2.2 Quartiles 6.2.3 Quartile Deviation 6.2.4 Standard Deviation & Variance.
7	7.1 Correlation 7.2 Regression.

**Computer Science-Data Structure with C++
Paper III**

Unit No.	Topic
1	Introduction
	1.1. Introduction to Object Oriented Programming 1.2. C++ fundamentals
2	Classes and Objects
	2.1. Classes 2.2. Constructors and Destructors 2.3. Inline functions 2.3.1 Defining inline functions within a class 2.4. Friend functions and classes 2.5. Static class members 2.5.1 Static data members and member functions 2.6. Local and nested classes 2.7. Passing objects to functions and returning objects form functions 2.8. Object assignment
3	Arrays, Pointers, References and the Dynamic Allocation Operators
	3.1. Arrays of objects 3.2. References 3.3. Dynamic allocation operators 3.4. pointers to objects 3.5. this pointer
4	Function overloading, copy constructor and Default arguments
	4.1. Function overloading 4.2. Overloading constructor function 4.3. Copy constructor 4.4. Default function arguments
5	Operator overloading
	5.1. Creating a member Operator Function 5.2. Operator overloading using friend functions 5.3. Overloading new and delete 5.4. Overloading some special operators
6	Inheritance
	6.1. Base class Access control 6.2. Inheritance and protected members 6.3. Inheriting multiple base class 6.4. Constructor destructors and inheritance 6.5. Virtual base class
7	Virtual functions and polymorphism
8	Templates
	8.1. Generic functions 8.2. Applying generic functions 8.3. Generic classes
9	Exception handling
	9.1. Exception handling fundamentals 9.2. Handling derived class exceptions
10	I/O system
	10.1. Stream and stream classes

	10.2. formatted I/O 10.3. FILE I/O 10.3.1. Opening and closing files 10.3.2. Reading and writing text files 10.3.3. Unformatted and binary I/O
	Data Structure
11	Primitive Data Structure and Operations on them
12	Non primitive Data Structure
	12.1. Arrays 12.1.1. Single and Multiple array 12.1.2. Storage representation 12.1.3. Operations 12.2. Stack 12.2.1. Operations on stack 12.2.2. Application in recursion, polish notation etc. 12.3. Queues 12.3.1. Types of Queue 12.3.2. Operation on Queue and Application 12.4. Linked Lists 12.4.1. Types of linked list 12.4.2. Operations on linked list and applications 12.5. Tree 12.5.1. Concept and definition of tree & operations 12.5.2. Binary tree, 2-3 tree, Height and Weight balanced tree 12.5.3. Linked and threaded representation of tree and applications
13	Sorting and Searching
	13.1 Insertion sort, selection sort, Quick sort 13.2 Sequential Search 13.3 Binary Search

Computer Science SYSTEM DEVELOPMENT TOOLS

Paper IV

Unit No.	Topic
	Visual Basic .NET
1	Overview of Microsoft .NET Framework
	1.1. What is .NET Framework and its benefits 1.2. The Common Language Runtime(CLR), purpose of CLR 1.3. Managed/ Unmanaged code, Compilation and Execution 1.4. Memory Management, Garbage collection 1.5. The .NET framework class library 1.6. .NET Web Services 1.7. Introduction to MS visual studio .NET
2	VB.NET programming language
	2.1. Data Types, Type Conversion Functions, Operator and expressions 2.2. Variable declaration: Levels, Lifeline, Scope and Accessibility 2.3. Array, Collections, User Defined Data types 2.4. Decisions Structures 2.5. Loop Structures: While, Do..Loop, For..Next, For Each..Next, With..End With 2.6. Nested Control Statements, Exit & End statements 2.7. Procedures.
3	Console Applications
	3.1. Console Class 3.2. Handling Strings, Characters and Dates
4	Object Oriented Programming
	4.1. Classes: Methods, Properties, Fields, Events 4.2. Overloading 4.3. Constructors and Destructors. 4.4. Creating and Using objects, Managing groups of objects 4.5. Abstraction Encapsulation and Polymorphism 4.6. Events & Delegates 4.7. Interfaces & Inheritance 4.8. Namespaces
5	Designing Using Interface
	5.1. Working with Forms 5.2. Basic Windows Controls 5.3. Menus, Timer, Common Dialog Controls 5.4. SDI and MDI Applications
6	Data Access
	6.1. History Of Microsoft Data Access Technologies 6.2. Overview Of ADO .NET 6.3. The Server Explorer and Query Builder 6.4. ADO.NET object model 6.5. Programming with ADO.NET
	Advanced Visual Basic.NET and ASP.NET
1	Data Reporting Tool(Crystal Report)
	1.1 Designing report with and without Report Export 1.2 Record Selection Export 1.3 Sorting, Grouping and Totaling Data on Report

	1.4 Report Formulas and Report Parameters 1.5 Accessing and manipulating report from VB.Net
2	Exception Handling
	2.1Error in programming 2.2Exception Handling Overview 2.3Structures Exception handling 2.4Programmer-Defined Exception Class 2.5On Error Statement.... Go To Statement 2.6Debugging
3	Multithreading
	3.1 Introduction To Thread 3.2 Life Cycle of a Thread 3.3 Creating Multithreaded Applications 3.4 Thread Priorities and Thread Scheduling 3.5 Thread Synchronization
4	Introduction to Web Programming.
	4.1Introduction to HTML 4.2 Overview of ASP.NET 4.3 Building a Web Application 4.4 Building Forms with Web Controls 4.5Validation User Input 4.6 Session Tracking
5	ASP.NET Database programming
	5.1 Understanding Data Binding 5.2 Working with Data Grids

**Computer Science RELATIONAL DATABASE MANAGEMENT SYSTEM
Paper V**

Unit No.	Topic
1	Introduction to DBMS
	1.1. What is Database 1.2. Requirement of Database System 1.3. Data Models and Data independence 1.4. DDL and DML 1.5. Database Manager, Database Administrator
2	Entity Relationship Models
	2.1 Entities and Entity Sets 2.2 Relationship and Relationship Sets 2.3 Mapping Constraints 2.4 Primary Keys 2.5 Entity Relationship Diagram and Reducing it to Tables 2.6 Generalization and Specialization 2.7 Aggregation
3	Relational Model
	3.1 Structure of Relational Database 3.2 Relational Algebra
4	Relational Database Design
	4.1 Functional Dependencies 4.2 Referential Integrity 4.3 Need for Normalization 4.4 Normal Forms 4.5 Data Dictionary 4.6 Tables, Table spaces & Data files, Views.
5	Crash Recovery
	5.1 Failure Classification 5.2 Transactions 5.3 Incremental log with differed and immediate updates 5.4 Checkpoints 5.5 Buffer Managements 5.6 Shadow Paging
6	Security Control and Integrity
	6.1 Security and Integrity Violation 6.2 Authorization and Views 6.3 Encryption
7	SQL
	7.1 Overview of SQL 7.2 Various types of Data, Conversions and Terminology 7.3 Retrieval of information from tables: Making a query, SELECT Command, Column Recording, Use of Relational Operators, Use of Boolean Operators, Operations like IN, BETWEEN, LIKE NULL, NOT, etc., Aggregate Functions, COUNT, GROUP BY Clause, HAVING Clause. 7.4 Formatting Query Output: String and Expressions, Ordering Outputs by Fields, Multiple Columns, Aggregate Group, Column No., ORDER BY, With NULL.

	<p>7.5 Querying multiple tables: Joining Tables through Referential Integrity, Equi joins and other kinds of Joins, joins of More than Two Tables, Joining a table to itself.</p> <p>7.6 Subqueries DISTINCT with subqueries, Predicates with subqueries, Aggregate functions in subqueries, Correlated subqueries, Correlating table to itself, Correlated subqueries in HAVING, Correlated subqueries and Joins, EXISTS Operator, Using Exists with Correlated subqueries, Combining EXISTS and Joins, Special Operator ANY or SOME, ALL, UNION Classes</p> <p>7.7 Entering, Deleting and Changing Field Values DML Update Command, UPDATE with Multiple Columns, UPDATIng to NULL Values, INSERT Command, using subqueries with UPDATE Command</p> <p>7.8 CREATE TABLE Command Indexing, Altering a Table, Dropping a Table, Constraining a Table, Declaring Constraints, PRIMARY KEY Constraint, Foreign and Parent Keys, Multicolumn Foreign Keys, FOREIGN KEY Constraints, Foreign Key Restrictions.</p> <p>7.9 CREATE VIEW Command Updating Views, Group Views, Views and Joins, Views and Subqueries, Changing values through Views, GRANT Command using ALL and PUBLIC Arguments, GRANT OPTION.</p> <p>7.10 PL/SQL</p> <p>7.10.1 Using Variables, Constants and Data types.</p> <p>7.10.2 User-Defined RECORD and TABLE data types.</p> <p>7.10.3 Assigning Database Values to variables SELECTINTO....CURSORS</p> <p>7.10.4 Using Flow Control Statements The IF.....THEN Statemetn, The LOOP statemetn, WHILE loops, the GOTO statement.</p> <p>7.10.5 Error handling, Built in PL/SQL Exception, User-defined Exceptions, unhandled Exception.</p> <p>7.10.6 PL/SQL Programs. Anonymous PL/SQL Blocks, Procedures, Functions, packages, Triggers.</p>
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**Mathematics – Calculus & Differential Equations
Paper III**

Unit No.	Topic
1	1.1 Functions of two variables 1.2 Limits and continuity 1.3 Derivations 1.4 Partial derivatives 1.5 Euler's theorem 1.6 Taylor's theorem 1.7 Jacobian and its properties 1.8 Evaluation of Jacobian
2	2.1 Maxima-Minima for functions of two variables 2.2 Necessary and sufficient conditions for extreme value of functions of two variables 2.3 Double integration of bounded functions on bounded domain. 2.4 Triple integration of bounded functions on bounded domain. 2.5 Change of order of integration 2.6 Change of variables 2.7 Gamma Beta functions 2.8 Evaluation of integrals using Gamma- Beta functions.
3	3.1 Linear equations with constant coefficients 3.2 Particular integral 3.3 Complete integral 3.4 Homogenous linear equations 3.5 Auxiliary equations (Having unequal Equal and imaginary roots) 3.6 Method of finding particular integral 3.7 General solutions of finding linear equations with constant and variable coefficients.
4	System of linear algebraic equations. 4.1 Gauss elimination method 4.2 Jordan elimination method 4.3 Iterative methods 4.4 Gauss-siedel iteration method.

Mathematics – Discrete Mathematics

Paper IV

Unit No.	Topic
1	1.1 Relations 1.2 Binary relations 1.3 Its properties 1.4 Relation matrix and graph of a relation 1.5 Equivalence relation 1.6 Composition of binary relations 1.7 Converse of a relation 1.8 Partial ordering 1.9 Hasse diagram 1.10 well ordered set 1.11 Partially ordered sets 1.12 Lattices 1.13 Properties of Lattices 1.14 Lattices homomorphism 1.15 Some special type of lattices.
2	2.1 Boolean Algebra 2.2 Definitions 2.3 Boolean homomorphism 2.4 Join irreducible element 2.5 Boolean functions 2.6 Boolean expressions 2.7 Equivalence of Boolean expressions 2.8 Value of Boolean expressions 2.9 Boolean functions 2.10 Sum of product canonical form 2.11 Product of sum canonical form 2.12 Symmetric expressions 2.13 Characteristic of symmetric expressions 2.14 Minimization of Boolean function by Karnaugh method and Quine-Mollosky method.
3	3.1 Graph 3.2 Self loop 3.3 Parallel edges 3.4 Simple graph 3.5 Application of graphs viz.(Konigsberg Bridge problem Utilities problem Seating problem) 3.6 Degree of vertices and its properties 3.7 Sub graphs 3.8 Walks Paths 3.9 Circuits 3.10 Connected Graphs 3.11 Disconnected Graphs 3.12 Components of Graphs 3.13 Euler graphs 3.14 Condition of a graph to be Euler graph 3.15 Hamiltonian graphs.
4	4.1 Trees and its properties 4.2 Rooted tree 4.3 Planar graphs 4.4 Euler's formula for regions.