

Maharishi Mahesh Yogi Vedic Vishwavidyalaya

DIRECTORATE OF DISTANCE EDUCATION

Syllabus

Advance Diploma in Computer Application (ADCA)

w. e. f. July 2012

ADCA SEMESTER – I

S. No.	Paper Code	Paper No.	Paper Name	Marks
1.	1DSADCA1	I	Fundamentals of Maharishi Vedic Science (Maharishi Vedic Science – I)	100
2.	1DSADCA2	II	Fundamentals of Computer and Information Technology	100
3.	1DSADCA3	III	PC Packages	100
4.	1DSADCA4	IV	OOPS and Programming with C++	100
5.	1DSADCA5	V	Computerized Accounting and DTP	100
6.	1DSADCA6	VI	Practical – 1DADCA3 , 1DADCA4 and 1DADCA5	100

ADCA SEMESTER – II

S. No.	Paper Code	Paper No.	Paper Name	Marks
1.	2DSADCA1	I	Advanced Concept of Maharishi Vedic Science (Maharishi Vedic Science – II)	100
2.	2DSADCA2	II	Internet and E - Commerce	100
3.	2DSADCA3	III	Introduction to ASP.NET & C#	100
4.	2DSADCA4	IV	RDBMS using Oracle	100
5.	2DSADCA5	V	Elementary Mathematics	100
6.	2DSADCA6	VI	Practical – 2DADCA2, 2DADCA3 and 2DADCA4	100
7.	2DSADCA7	VII	Project	100

FUNDAMENTALS OF MAHARISHI VEDIC SCIENCE

(MAHARISHI VEDIC SCIENCE – I)

DIPLOMA/ADVANCED DIPLOMA/UG COURSES

UNIT - 1

Meaning & importance of Guru Pujan.

Meaning of meditation, Mann, Intelligence, Chita, Ego, Thought .

UNIT - II

Name of forty areas of Vedic Science and their expression in Human Physiology and characteristics of consciousness.

Consciousness, types of consciousness, characteristics of higher stages of consciousness.

UNIT - III

Maharishi's Yoga, Transcendental Meditation- a general Introduction, Types of Speech, TM Sidhi Programme, Principle of Yoga Asanas and their Concept.

UNIT - IV

Introduction: Maharishi Vedic Management.

Fundamental elements of Vedic Management –Totality

Management of Science and Art .

UNIT - V

Vedic Management and Leadership.

The Idea Leadership is based upon the Totality of Employee's Style

Suggested Readings:

- Chetna –His Holiness Maharishi Mahesh Yogi Jee
- Maharishi Sandesh - 1 and 2 , II-His Holiness Maharishi Mahesh Yogijee
- Scientific Yoga Ashanas –Dr. SatPal.
- Dhyani Shailly by Brahmchari Dr. Girish Ji

FUNDAMENTALS OF COMPUTER AND INFORMATION TECHNOLOGY

UNIT-1

Introduction to computer and information technology : History of development of computers, computer system concept , characteristics, capabilities and limitation , types of computer – analog, digital, hybrid, general, special purpose, micro, mainframe, super, generation of computer, personal computer (PCs) –IBM PCs, characteristics, PC/PCXT/PCAT-configurations, Pentium and Newer PCs specification and main characteristics, types of PCs-Desktop, Laptop, Notebook, Palmtop, Workstation etc , their characteristics.

Computer Organizations and Working: Basic component of a computer system –control unit, ALU, INPUT /Output function and characteristics, memory –RAM, ROM, EPROM, PROM and other types of memory.

UNIT-II

Input Devices: Keyboard, Mouse, Trackball, Joysticks, Digitizing tablet, Scanner, Digital Camera, MICR, OCR, OMR, BAR-CODE Reader, Voice Recognition, Light Pen, and Touch Screen.

Output Devices: Monitor –characteristics and types of monitor –digital, analog size, resolution, refresh rate, Interlaced /Non Interlaced, Dot Pitch, Video Standard –VGA,SVGA,XGA etc, Printer –Daisy wheel, Dot Matrix, Inkjet, Laser, line printer , plotter, sound card and speakers.

UNIT-III

Storage Devices: Storage Fundamental –Primary VS Secondary, Data Storage and Retrieval method –Sequential, Direct and Index Sequential, Various Storage Devices –Magnetic Tape ,Magnetic disks, Cartridge Tape, data drives, hard disk drives, floppy (Winchester disks), Disks, Optical Disks, CD,VCD,CD-R,CD-RW, ZIP Drive.

Computer Software: Need, types of software –system software, application software, system software-operating system, utility program, programming Language, assemblers, compiler and interpreter.

UNIT-IV

Operating System: Function, types –Batch, Single, Multiprogramming, Multiprocessing. Programming languages- Machine, Assembly, High Level and 4GL. Merit and Demerits of Programming Languages.

Disk Operating System (Dos) Introduction History & version of Dos basic –physics structure of disk drive name , Fat ,File & directory structure and naming rules , booting process , Dos system files. Dos command: Internal –DIR , MD , CD,RD,COPY,DEL, REN , VOL,DATE,TIME,CLS,PATH, TYPE etc. External – CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, TREE,MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB , HELP, SYS ,etc Executable V/s Non executable file in Dos.

Number System: Data representation in computer, number system of computer –Binary, Octal, Hexa-Representation & their conversion, coding system –ASCII, BCD, EBCDIC etc.

UNIT-V

Data Communication and Networks: communication channels –twister, coaxial, fiber, optic. Types of Networks –LAN, WAN, MAN etc, Topologies of LAN –Ring, BUS, STAR, MESH and TREE topologies , components of LAN-media , NIC,NOS, Bridges, HUB, Routers Repeater and Gateway .

Computer virus: Virus working principles, types of viruses, virus detection and prevention, viruses on networks. Use of communication and IT in daily life.

An Introduction: Modern Science and Vedic Science, Unified field based Computer Science.

Text & Reference Books:-

1. Learning Window 98 step by step by Rajeev Mathur , BPB Publication.
2. Learning Word 97 for Window by Rajeev Mathur , BPB Publication,
3. Learning Excel 97 for Window by Rajeev Mathur , BPB Publication.
4. A First Course in Computer by Sanjay Saxena , Vikas Publishing House New Delhi.
5. Microsoft Office 2000 by A. Mansoor by Pragya Publications.
6. Office 97 Interactive Course by Greg Perry, Tec media.
7. Microsoft Office 2000 by A. Mansoor by Pragya Publications.

PC PACKAGES

UNIT-I

Word-processing : MS-Word : Introduction to word processing, introduction to MS –Word: features, creating ,saving and opening document in word , interface , Toolbars , Ruler, Menus, Keyboard Shortcut, Editing a document – moving, scrolling in a document, opening multi document window, editing text selecting , inserting, delete , moving text, previewing document, printing document – Print a document from the standard toolbars, print a document from the menu , shrinking a document to fit a page, reduce the number of pages by one, formatting document: paragraph format, Aligning text and Paragraph, Border and shading, header and footer, multiple columns.

UNIT-II

Word-processing: Advanced Feature of MS Word: Find and replace, checking the grammar and spelling, formatting via find and replace, using the thesaurus, using Auto correct, Auto complete and Auto Text, Word count, Hyphenating, Mail merge, mailing labels Wizard and Templates, handling graphic, tables insert and modification, converting of tables, converting a word document into various formats like – Text, Rich Text Format, Word Perfect, HTML etc.

UNIT-III

Worksheet : MS-Excel : Worksheet basics, Creating worksheet, entering data into worksheet, heading information, data, text dates, alphanumeric, values, saving & quitting worksheet, opening and moving around in an existing worksheet, toolbars and menus , keyboard shortcut , working with single and multiple worksheet , coping, renaming, moving between work books, working with formulas & cell referencing – Auto sum, Coping formulas, absolute & relative addressing, working with range – creating editing and selecting range, formatting of worksheet – Auto format, changing –alignment, character styles, column width, date format , border & colors, currency sign.

UNIT-IV

Worksheet : MS-Excel: Previewing & Printing Worksheet- Page setting , print titles ,Adjusting margins, page break , headers and footer, graphs and chart – using wizard, various chart types, formatting grid lines & legends , previewing & printing charts , database – creation , sorting, query & filtering a database , function – database , date and times, maths & Trigonometry, statistical, Text and logical function, creating and using macros, multiple worksheet – concept, creating and using.

UNIT-V

MS PowerPoint: Introduction and area of use, working with MS PowerPoint, creating a new presentation working with presentation, using wizards, slides& different views, deleting coping slides, working with notes, handout, columns and list, adding graphics, sound and movies to a slide, working with power point objects designing and presentation of a slide show, printing and presentation, notes, Handouts with print options.

Outlook Express: Setup E-mail account with outlook, sending and receiving mail through outlook, concepts of CC,BCC, forwarding mail, draft message, formatting E-mail message, Concept of MIME protocol, attaching files and items into messages, inserting hyperlink using outlook editor and using send and receive group mails, opening received message, opening message with attachment, replying to mail forward message flagging for further action, setting email options, managing contacts with outlook, setting up multiple email accounts on single machine.

Reference Books:

- Window XP Complete Reference , BPB Publication
- MS Office XP Complete BPB Publication
- IT Tools and Applications Pragma Publications

OOPS & PROGRAMMING WITH C++

UNIT-I

PRINCIPLES OF OBJECT-ORIENTED PROGRAMMING: Object-Oriented Programming Paradigm, Basic Concepts of Object-Oriented Programming, Benefits of OOPs, Object-Oriented Languages, Applications of OOP, C++ Statements, Class, Structure of C++, Program, Creating the Source File, Compiling and Linking.

UNIT-II

TOKENS, EXPRESSIONS AND CONTROL STRUCTURES: Introduction Tokens, Keywords, Identifiers, Basic Data types, User Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Dereferencing Operators, Manipulators, Type Cast Operator, Expressions and Implicit Conversions, Operator Precedence, Control Structures.

UNIT-III

CLASSES AND OBJECTS: Specifying a class, Defining Member Function, making an Outside Function Inline, Nesting of Member function, private member function, Arrays within a class, Memory Allocation for Objects, Static Data Member, Static Member Functions, Arrays of Objects, Object as Function Arguments.

CONSTRUCTORS AND DESTRUCTORS: Introduction, Constructors, parameterized Constructors, Multiple Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructors, Dynamic Constructors and Destructor.

FUNCTIONS IN C++: The Main Function, Function Prototyping, call by Reference, Return by reference, Inline Functions, Default Argument, Const. Arguments, Function Overloading, Friend and Virtual Function.

UNIT-IV

OPERATOR OVERLOADING AND TYPE CONVERSIONS: Introduction, Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators Using Friends, Manipulation of strings using operators, Rules for Overloading Operators, Type conversions.

UNIT-V

INHERITANCE: EXTENDING CLASSES: Introduction, Defining Derived Classes, Single Inheritance Making a Private Member Inheritable, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance.

POINTERS. VIRTUAL FUNCTIONS AND POLYYPMORPHISM: Compile time Polymorphism, run time polymorphism, Pointers to Objects, This Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

TEXT & REFERENCE BOOKS:

Object Oriented Programming with C++ by E. Balaguruswami. TMH Publications ISBN 0-07-462038-x

Object Oriented Programming in C++ by Nabajyoti Barakati SAMS PHI Pvt. Ltd.

Insights into OOPS & C++. Rajeshwar Shukla, Pragya Publications .

COMPUTERISED ACCOUNTING AND DESK TOP PUBLISHING

UNIT-I

Basic Concept of Accounting Financial Statements, Financial, Statements, Analysis, Cost Centre, Basic concept of Inventory, Tally Configuration & INI setup, Data Directory & Folder, Configuration, Single & Multiple User Tally Screen Components, Mouse / keyboard Convention & Key, Combination switching between screen areas, Quitting Tally. Maintaining Company data Create/Alter/Select/load/Close a Company, Chart of Account, Company Features, Configuration.

Create, Alter & display Groups, Ledgers, All accounting voucher types and transactions ,create and Alter new Voucher types, Item and Account Invoice Transaction, Excise Invoice, Export Invoice, Transaction using Bill-wise detail create, Alter & Display Cost Center and Cost Categories, Cost centre & cost Category allocation in voucher entry, Creating Cost centre Class, Invoice entry in a Class situation, Create , Alter & Delete Foreign Currencies, Voucher entry using foreign currency Bank reconciliation, Interest calculation using simple & advance parameter, Interest calculation on outstanding balance & on invoices, Use of voucher class, adjustment of interest, Creation of voucher class Invoices entry in a class situation.

UNIT-II

Create, Alter & delete Budgets for groups, Ledger & cost center, Defining Credit Limit & Credit period, Display Budgets & variances, Create Alter & Delete a scenario. Enabling Job Costing in Tally, Master creation & configuration for job costing , creation of voucher types & Voucher class for stock Transaction , Creation of Transfer journal for transfer of stock between godowns, Consumption journal Transaction, Payment voucher , Go down summary Report , job Works Analysis , Material consumption summary . Report Like balance sheet , profit & loss account Ratio analysis, Trial Balance Account books Like cash /bank books, All Ledger Group summary & voucher , Sales , purchase & journal registers , cost centre & category summary , cost centre breakup, ledger & group breaker, outstanding receivables & payables, interest receivable & payable, statistics, cash & fund flow, day books, list of Accounts, Reversing journals, optional voucher, post –dates vouchers.

UNIT-III

Create, Alter & Display Stock Group and Stock Item, Stock item behaviour using costing and market valuation method, other behaviour like treating all sales as new manufacture, treating all purchase as consumed, treating all rejection inward as scrap, ignoring negative balances, treating difference due to physical counting, Create Alter & display stock categories, Create, Alter, Display simple & compound units of measures, stock item using alternate units , Defining standard cost & selling prices , Defining Rate of duty, Defining MRP, Create ,Alter & Display Godown, Allocation of item to the Godowns, All Inventory voucher types and transaction, Inventory detail in accounting voucher. Defining re-order Level, Transaction using tracking

number, Use of batch –wise detail in accounting voucher, Additional cost detail in voucher, creating Bill of material, cost estimation, creating prices list & defining Prices levels, invoices using Prices List, Zero valued entries, Transaction in case of Different actual & billed quantities .Report Like Stocks summary, Inventory books Like Stock item, Group summary, Stock transfer, physical stocks register, Movement analysis, stock group & item analysis, stock category analysis, Ageing analysis, sales order & Purchase order books , Statement of inventory related to Godowns, categories, stocks query, Reorder status, Purchase & sales order summary, Purchases & sales bill pending, exception report stocks & Ledger, overdue receivables & payables, memorandum voucher, optional voucher, post –dated voucher, reversing journals.

Cheque Printing, Common Printing options, Different printing formats, Multi-Account printing, Dynamic Report specific options. Creating Group company, Use of Tally vault, Using security control & defining different security Levels, Use of Tally Audit, Backs –Up & Restore, splitting company data, Export & Import of data, ODBC compliance, use of E-Mail, Internet publishing, Upload, Web browser & online help, Rewrite data.

Unit - IV

Introduction: Definition, Importance and characteristics of DTP. Use of DTP in publishing & Newspaper Printing. Various DTP Software. Bit stream & vector graphics. Printers –Dot Matrix, Inkjet and Laser. Introduction to offset printing technology. Typography – history , element , selection of fonts, point use of blank spaces and dashes, white spaces, various breaks, Good designing and Easy readability. Different Measurement used in DTP printing.

Introduction to Adobe PageMaker. Why Page Maker popular in publication. Toolbox, Styles, Menus, Templates . Page Orientation & Page Setup. Importing & Text block. Spell Check & find & Replace. Working with text and graphics. Columns & gutters. Different Page Layouts. Master page, page Numbering. Auto flow . Story Editor & Layout view. Attribute setting, Alignments, grids, and Guides etc. Tab setting.

Unit - V

Import & Export of files. Styles & Palettes. Using colors. Fonts: Post script font, true types fonts, bit stream & vector fonts. Column Balancing, Breaks. I Reverse Text. Reverse Command. Printing Options. Placing Text Graphic. Picture Editing . Bullets, Masking. Window & Orphan Lines. Text Wrapping. Drop Caps. Control Palette.

Clips & Image Files. OLE & Embedding . Plugging. Tables Editors . Filters, Layer, PDF files. Header & Footers. Key board Control. Linking . Mathematics equation. Printing Options. Frame options.

Maharishi Vedic Science - II

MMYVODE

INTERNET & E-COMMERCE

UNIT-I

Internet- evolution, Protocols, Interface Concepts, Internet Vs Intranet, Growth of Internet, ISP. Connectivity- Dial Up, Leased Line, VSAT etc., URLs, Domain names, Portals. Application E-MAIL- Concepts, POP and WEB Based E-mail, merits, address, Basics of Sending & Receiving E-mail Protocols, Mailing List, Free E-mail.

INTERNET protocols- Data Transmission Protocols, Client/Server Architecture & its characteristics, FTP & its usages, Telnet Concept, Remote Logging, Protocols, Terminal Emulation, Message Board, Internet chatting- Voice chat, text chat.

UNIT-II

World Wide Web (WWW) – History, working, Web Browser, its function, Concept of search engines, Searching of web, HTTP, URLs, Web Servers, Web Protocols, Web Publishing- Concepts, Domain name, Registration, Space of host Server for web site, HTML, Design tools, HTML Editors, Image Editors, issues in web site creations & Maintenance, FTP software for upload web site

UNIT-III

HTML- Concepts of Hypertext, Versions of HTML, Elements of HTML, syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Color controls, Different HTML tags, Table layout and presentation, Use of font size & Attributes, List types and its tags, Use of Frames and Forms in web pages. Introduction to WYSIWYG Design tools for HTML, Overview of MS FrontPage, Macromedia Dream weaver, and other popular HTML editors, Designing web sites using MS FrontPage .

UNIT-IV

JavaScript Overview, syntax & conventions, Variables, Expressions, Branching & Looping statements, Functions, Arrays, Objects, Events & Document Object Model- onClick, onMouse Over, onSubmit, onFocus, onChange, onBlur, onLoad, onUnload, Alerts, Prompts & Confirms.

UNIT-V

E- commerce : An introduction, Concepts, Advantages and disadvantages, Technology in E-Commerce, Internet & E-business, Applications, Feasibility & various constraints, E-transition challenges for Indian corporate. Electronic Payment System: Introduction, Type of Electronic Payment Systems, Digital Token-Based Electronic Payment Systems, Smart Card and Electronic Payment Systems, Credit Card Based Electronic Payment Systems, Risk and Electronic Payment Systems.

TEXT & Reference Books:

Internet and Web Design Made Easier By A. Mansoor. Pargya Publications.. Matura

O Level Module – M 1.2- Internet & Web page designing by V.K. Jain- BPB Publications,

E-Commerce An Indian Perspective (Second Edition)-By P.T. Joseph, S.J. Presentice-Hall of India

Internet for Everyone- Alexis Leon and Mathews Leon, Vikas Publishing House Pvt. Ltd. New Delhi

INTRODUCTION TO ASP.NET & C#

UNIT –I

Overview of ASP.NET framework, Understanding ASP.NET Controls, Applications Web servers, installation of WS. Web forms, web form controls -server controls, client controls, web forms & HTML, Adding controls to a web form ,Buttons, Text Box, Labels, Checkbox, Radio Buttons, List Box, etc. Running a web Application, creating a multiform web project.

UNIT-II

Form Validation: Client side validation, server Side validation, Validation Controls: Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control. State management- View state, Session state, Application state.

UNIT –III

Architecture of ADO.NET, Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class, Command Class, Data Adapter Class, Dataset Class. Display data on data bound Controls and Data Grid. Database Accessing on web applications: Data Binding concept with web, creating data grid, Binding standard web server controls. Display data on web form using Data bound controls.

UNIT-IV

Writing datasets to XML, Reading datasets with XML. Web services: Introduction, Remote method call using XML, SOAP, web service description language, building & consuming a web service, Web Application deployment.

UNIT –V

Overview of C#, C# and .NET, similarities & differences from JAVA, Structure of C# program. Language features: Type system, boxing and unboxing, flow controls, Classes, interfaces, Serialization, Delegates, Reflection.

REFERENCE BOOKS:

- *VB.NET BLACK BOOK BY STEVEN HOLZNER DREAMIECH*
- *ASP.NET UNLEASHED*
- *C# PROGRAMMING WROX PUBLICATION*
- *C# PROGRAMMING BLACK BOOK BY MAN TELLES*

RELATIONAL DATA BASE MANAGEMENT SYSTEM USING ORACLE

(RDBMS USING ORACLE)

UNIT-I:- INTRODUCTION: -Advantages of DBMS approach, various views of data, data independence, Schema & sub-schema, Primary concepts of data models, Database languages, Transaction management, Database administrator & uses, data dictionary, Overall system architecture.

ER MODEL: - Basic concept, Design issues, Mapping constraints, Keys, ER diagram, weak & strong entity sets, specialization & generalization, aggregation, inheritance, design of ER schema, Reduction of ER schema to tables.

UNIT –II: - DOMAIN RELATIONS & KEYS: - Domains, Relations, Kinds of relation, relational databases, various types of keys, candidate, primary, alternate & foreign Keys.

RELATION ALGEBRA & SQL :- The structure, relation algebra with extended operations, Modification of database, idea of relational calculus, Basic structure of SQL, set operation, Aggregate function, Null values, Nested sub queries, Derived relations, views modification of database, Join relations, DDL & SQL .

UNIT– III:- FUNCTIONAL DEPENDENCIES & NORMALIZATION: Base definitions, Trivial & non-Trivial dependencies, Closure set of dependencies & of attributes, Irreducible set of dependencies, introduction to normalization, Non- loss decomposition, FD diagram of I, II & III NF, Dependencies prevention, BCNF, Multi-valued dependencies prevention's, BCNF, Multi-valued dependencies & ANF, Join dependencies & 4 NF. **DATABASE INTEGRITY :-**General idea, Integrity rules, Domain rules, Attribute rules, Relation rules, Database rule, assertions, triggers, Integrity & SQL.

UNIT- IV: - DISTRIBUTED DATABASES: - Basic idea, distributed data storage, Data replication, Data Fragmentation, horizontal, vertical & mixed fragmentation. **EMERGING TRENDS IN DBMS :-** Object – Oriented database- Basic idea & the model Object structures Object, Class, inheritance, multiple object identity, Data warehousing terminology, definitions, characteristics, Data mining & its overview, Database on www, multimedia database difference with conventional DBMS, issues, similarity based retrieval continuous media data, multimedia data formats, video servers.

UNIT- V: - NETWORK & HIERARCHICAL MODEL: Basic idea, Data structure diagram, DBTG model, implementation, Tree structure diagram, Implementation techniques, comparison of three models.

TRANSACTION CONCURRENCY & RECOVERY:- Basic concept, ACID properties, Transaction state, Implementation of atomicity & durability concurrent executions, Basic idea of serializability, Basic idea of concurrency control, Basic idea of deadlock, Failure classification, storage structure - types, stable storage implementation, data access, Recovery& Atomicity – Log based recovery, deferred database modifications, immediate database modifications, checkpoints.

Text Books:-

1. Henry F.Korth & A. Silbershatz: Data System Concepts. Mc-GrawHill.
2. Arun K. Majumdar & P.Bhattacharya: Data Base Management System. TMH

References Books:-

1. Bipin C. Desai: An Introduction to Database System, Galgotia Pub. Co.Ltd.
2. Jeffrey O. Ullman: Principles of Database Systems, Galgotia Pub. Co.Ltd.
3. James Martin: Principles of Database Management . PHI
4. James Martin, Computer Database organization. PHI

ELEMENTARY MATHEMATICS

UNIT-I

Sets and Their Representations. Empty Set, Finite & Infinite Sets, Equal Sets. Subsets. Subsets of the Set of Real Numbers Especially Intervals (with notations). Power Set. Universal Set. Venn Diagrams. Union and Intersection of Sets. Difference of Sets. Complement of a Set. Ordered Pairs, Cartesian Product of Sets. Number of Elements in the Cartesian Product of two Finite Sets. Cartesian Product of the Reals with itself (upto $\mathbb{R} \times \mathbb{R} \times \mathbb{R}$). Definition of Relation, Pictorial Diagrams, Domain. Co- domain and Range of a Relation.

UNIT-II

Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain & range of a function. Real valued function of the real variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their graphs. Sum, difference, product and quotients of functions. Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions, composite functions, inverse of a function. Binary operations.

UNIT-III

Complex numbers, Brief description of algebraic properties of complex numbers. Argand plane and polar representation of complex numbers. Statement of Fundamental Theorem of Algebra, solution of quadratic equations in the complex number system. Fundamental principle of counting. Factorial n . $(n!)$, Permutations and combinations,.

UNIT-IV

Sequence and Series. Arithmetic Progression (A.P.). Arithmetic Mean (A.M.) Geometric Progression (G.P.), general term of a G.P sum of n terms of a G.P., geometric mean (G.M.), relation between A.M. and G.M. Sum to n terms of the special series Σn , Σn^2 and Σn^3 .

UNIT-V

Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axes, point-slope form, slope-intercept form, two point form, intercepts form and normal form. General equation of a line. Distance of a point from a line. Standard equation of a circle, Coordinate axes and coordinate planes in three dimensions. Coordinates of a point.

TEXT & REFERENCE BOOKS:

- www.e-booksdirectory.com/mathematics
- www.origoeducation.com/go-maths.
- *BASICS OF MATHEMATICS BY R D SHARMA.*