Veer Narmad South Gujarat University
Surat

Master of Information Technology
[Five Year Integrated Course]

Syllabus
(Revised)

Effective from July 2008-2009

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semester I

Teaching and Evaluation Scheme

Paper Sr. No.	Paper Title	Teaching Schedule (Hours/Week) Lect	Prac	University Exam Theory / Practical Duration | Hrs.	Marks	Internal Exam Theory / Practical Duration | Hrs.	Marks	Total Theory / Practical
101	Maths - I	4	-	3	70	2	30	100
102	Fundamentals of Computers	4	-	3	70	2	30	100
103	The Science of Programming	4	-	3	70	2	30	100
104	Internet and Web Technology	4	-	3	70	2	30	100
105	Communication Skills	4	-	3	70	2	30	100
106	Practical		10	5	140	3	60	200
Total		30			490		210	700

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Semester I

Paper No : 101
Paper Title : Maths – I. L: 4 Hrs

1. **Relations:**
   Cartesian Product of sets; relations as sets of ordered pairs; types of relations; Properties of relations; Congruence relations; Equivalent classes; Composition of relations; Algebra of relations.

2. **Functions:**
   Functions as sets of ordered pairs; Types of functions; Equality of functions; Algebra of functions; Composition of two functions; Inverse functions; Characteristics functions; Functions in Business economics; Equilibrium prices.
   Binary operations; Properties of Binary operations.

3. **Theory of Matrices:**
   Matrices; Types of matrices; Equality of matrices; Operations on matrices; Properties of Operations Singular Matrices; Inverse of Matrix; Adjoint of Matrix; Rank of Matrices; Elementary Row/Column transformations; Row/Column equivalent canonical forms; Inverse using elementary transformations; Solution of a system of linear equations using elementary transformations.

4. **Basic Statistics:**
   Introductions: Definitions Merits and demerits: Frequency distributions and frequency charts;
   Measures of Central tendency: Arithmetic mean; geometric mean; Harmonic mean; Median; Mode; Quartiles, Deciles and Percentiles.
   Measures of Dispersion: Range, Quartile deviation; Mean deviation; Standard deviation; Skewness and Kurtosis.

5. **Probability Theory:**
   Introduction: Definition; Sample spaces: Events: Types of events; algebra of events; Conditional Probability; theorems on probability; Baye's theorem.

6. **Random variables and distributions:**
   Random variables (discrete and continuous); Mathematical expectations and Variance. Discrete Probability Distributions: Binomial Distribution; Density function; Mean and variance of the Distribution Properties and uses.
   Poisson Distribution: Density function; Mean and Variance of the distribution, properties and uses.

Main Readings :

1. C. L. Liu: Elements of Discrete Mathematics: McGraw Hill: 2nd Ed: 1985.
2. B.S. Vatssa: Discrete Mathematics: Wishwa Prakashan.: 3rd Ed.: 2000
3. Suddhendu Biswas: A Text Book of Matrix Algebra: New age International Publishers, New Delhi: 2nd Ed.: 1997

Supplementary Reading:

1. B.L. Agrawal: Basic Statistics: New – age International Publishers, New Delhi.: 1996
2. A.M. Gun: M.K. Gupta & B. Dasgupta: Fundamentals of Statistics (Vol. 1): World Press: 2002
3. Kapur and Gupta: Fundamentals of Mathematical Statistic: S. Chand & Sons.: 2003
4. K. B. Datta: Matrix and Linear algebra: Prentice Hall of India: 1991.
5. N. R. Jayaram: College Mathematics: Himalaya Publication House:2001

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Semester I

Paper No : 102
Paper Title : Fundamentals of Computers L: 4 Hrs

1. **Introduction**
   History of Development of Computers, Hardware, Software, Firmware, Types of Computers
2. **Basic Computer Architecture**
   CPU Block Diagram, Memory Organization, Addressing Techniques and Modes, Instruction execution
3. **Memory & Devices**
   RAM, ROM, PROM, EPROM, EEPROM, Extended Memory, Expanded Memory, Virtual Memory, Cache Memory
   I/O and Secondary storage devices: Floppy Disks, Hard Disk, Disk Architecture, Keyboard, Mouse, Scanner, Web Camera, Joysticks, VDU, Touch Screen, Printers, Plotter, USB Devices, CD/DVD-ROM, Hand held devices, Wireless devices (Wireless keyboard, mouse) , Modem
4. **Number System & Codes**
   Various Number Systems and Arithmetic, Conversion of Numbers, Character Codes (ASCII, EBCDIC, BCD, Excess-3, Gray etc.), Binary and Hexadecimal Arithmetic.
5. **Operating Systems**
   Basic functions of OS, Categories and examples of OS, DOS/Windows Commands, BIOS, POST and Booting Process
6. **Introduction to Office Tools**
   Word Processing, Presentation, Spread sheets

Main Readings:

1. V Rajaraman: Computer Fundamentals: PHI: 2000
2. P.K. Sinha: Computer Fundamentals: BPB: 4th Ed.: 2007
3. Wyatt: Using MS-DOS: PHI: 2nd Ed.: 2000
4. Couser: Mastering Microsoft Office: BPB: 1999
5. Bott: Using MS Office: PHI: 2000
6. Alan Neibauer: Office 2000 made Easy: TMH: 2000

Supplementary Readings :

1. Ron White: How Computers work: Techmedia: 2002
2. Peter Norton: Complete guide to DOS 6.22: PHI:1994
3. Peter Norton: DOS guide updated to 6.22: PHI: 1999
4. Hunt & Shelley: Computer and Commonsense: PHI: 4th Ed.: 2000
5. Peter Norton: Inside the PC: Techmedia: 8th Ed.: 1999
6. Noel Kalicharan: An Introduction to Computer Studies: Cambridge Low Price Ed.: 1996

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Semester I

Paper No : 103
Paper Title : The Science of Programming **L: 4 Hrs**

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1. Phases of Problem Solving Methodology

Problem Analysis

Gathering available data, Identifying relevant facts, Defining the problem, Generating alternative methods of solution, Selecting the optimum approach

Problem solving techniques

Simplification, Divide and conquer: break down a large, complex problem into smaller, solvable problems, Constraint examination

Algorithm

What is an algorithm, How to design an algorithm, Algorithm Efficiency Considerations

Flowcharting

Definition and purpose, Conventions to be used, Branching and looping

2. Introduction to Computer Programming

Computer Programming Language and Program, Programming as a Goal Oriented Activity, Programming languages and Levels, Compiler, Interpreter, Editor

3. Development of Programs

Constants, Variables, Operators, Expressions

Character Set, Constants, Variables - needs & definition, Using Only Required Variables, Operators, Expression, Evaluation & Assignment of Expression, Operator Precedence Rules

Instruction Set, Input & Output Statements

Developing Loops, Branches and Jumps from Invariants and Bounds

Developing the guard first, Making Progress Towards Termination, Fixed and Variable Loops, Decision Making Constructs, Program Control Flows

Built-in Functions, Arrays, User Defined Functions and Procedures, Modular Structured Programming

File Organisation - Sequential, Binary, Random

4. Program Verification and Optimization

Program Correctness, Program Bugs & Testing, Optimal Programming Approach, Program Efficiency Consideration

Main Readings :

1. Balaguruswamy: Programming in BASIC: TMH: 2000
2. Venkateswaran: Qbasic For MS DOS 5.0.: Jaico publication: 1999
3. David Gries: The Science of Programming: Narosa publications: 1989
4. Andrew S. Tanenbaum: Structured Computer Organization: PHI: 2000
5. Gottfried: Programming with BASIC: TMH: 2000

Supplementary Readings :

1. James: Foundations of Programming: BPB
2. La Budde: Structured Programming Concepts: Mc.Graw Hill
3. Kenetkar: Programming expertise in BASIC: BPB
4. Seymour C. Hirch: BASIC Programming self taught: PHI
5. Jain: BASIC Programming with Applications: TMH
6. Juliff: Program Design: PHI
7. J.Kelly: **The Essence of Logic**: Prentice Hall of India

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Semester I

Paper No : 104
Paper Title : Internet and Web Technology L: 4 Hrs

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1. **Introduction to Internet**
   History of internet, Working of Internet, Internet Applications, Advantages of Internet, WWW, Uniform Resource Locator, Web Pages, Web Server, Web Browsers, Communication Media, Domain Name Service

2. **Internet Connection Techniques**
   Internet Service Providers, Dial Up Connections, Digital Subscriber Line (DSL), Broadband, ISDN, Dedicated Connections, Wireless Connection, Wi-Fi, Wi-MAX

3. **Communicating on the internet**
   Email, Email Spam and Blocking, Usenet Newsgroups Work, Internet Chat and Instant Messaging, VOIP, Upload and Download, Connecting remote machines, Search engines and Search Techniques, Blogs, Video Conferencing, i-TV

4. **Introduction to HTML**
   HTML Structure, Document Head, Document Body, Title and Footer, HTML Editors (FrontPage, Visual Interdev, Dream Weaver)

5. **Text Formatting, Links, Tables and Image Tags**
   Paragraph breaks, Line breaks, Bold, Italics, Underline, Spacing,
   Heading style, Line breaks
   External links, Internal links, Image as Hyperlink, Image Maps
   Table Header, Data rows, and Caption , Width and Border, CELLPADDING, CELLSPACING, BGCOLOR, COLSPAN, ROWSPAN
   Images, height, width, src

6. **Forms, Frames and Embedding Object Tags**
   Text, Button, Radio, Checkbox, Password, Hidden, Button, Textarea, Label, Submit and Reset, Tab Navigation, Access Keys
   FRAMESET, FRAME, Targeting named frames, Communicating between Frames, Inline Frames
   OBJECT tag, Adding dynamic content with OBJECT

7. **Cascading Style Sheet (CSS)**
   Style Sheet Types, Linked, Embedded, Inline, Style Sheet Precedence, Style Sheet Syntax, Using Classes, Using Media Types, Font Control, Text Control, Color and Background, List Box Control, Miscellaneous Properties, Defining Aural Style Sheets, Controlling Position with CSS, Box Model, Margin and Padding Properties, Border Properties, Tables, Absolute versus Relative Properties, Pages Media

Main Readings :

1. Preston Gralla: How the Internet Works: Techmedia: 1999
2. Sybex: HTML Complete: BPB: 2000
3. Douglas E. Comer: The Internet: PHI: 2nd Ed.: 2000
4. Thomas: The complete Reference HTML: TMH: 2000
5. Christian Crumlish: The ABCs of the Internet: BPB: 1998

Supplementary Readings :

1. Glee Harrah Cady, Pat McGregor: Mastering the Internet: BPB: 1996
2. Thoma's Powell: HTML Programmer's Reference: Tata McGraw Hill: 2nd Ed.: 2001
3. Joe Kraynak: Internet 6 IN 1: PHI: 2000
4. Brian Underdahl: Internet with Web Pages/ Web Site Design Bible: IDG Books India: 2000
5. C Xavier: World Wide Web design with HTML: Tata McGraw Hill

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Paper No : 105
Paper Title : Communication Skills **L: 4 Hrs**

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1. **Listening Skills**
   Barriers to listening, Effective listening skills, Attending telephone calls, Note – taking
2. **Speaking and discussion Skills**
   Component of effective talk/presentation, Discussion Skills
3. **Reading Skills**
   Reading tactics and strategies, Reading outcomes , structure of meaning, technique
4. **Writing Skills**
   Guidelines for effective writing , Writing styles for application with personal resume, Technical report writing, Development of paragraph
5. **Practical Communication**
   Situation based conversations, Listening skills, Mock seminars, Group discussion, Ex-temper speeches, Debate, Role-plays, Description of people places and objects.

Main Readings :

1. Jayshree Mohanraj, S Mohanraj : English Online Communication Information Technology: Orient Longman
2. Chrisle W.: Handbook for practical communication skill: Jaico Publishing House: 2001
3. Sheil Smith & T.M. Methuen: Reading to learn
4. R P. Bhatnagar, R.T. Bell: Communications in English: Orient Longman
5. Tickoo, Sashikumar: Writing with purpose: Oxford: 2007

Supplementary Readings :

1. Krishna Mohan: Developing Communication Skills: Macmillan: 1990
2. Z. N. Patil: English for Practical Purposes: 2006
3. E. H. McGrath, S. J.: Basic Managerial Skills for all: 5th Ed.: PHI: 2000
4. Ranu Vanikar: Corridors to communication: Orient Longman: 2006

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Semester I

Paper No : 106
Paper Title : Practicals. **P: 10 Hrs**

Practicals based on Paper no. 102, 103, 104 & 105.

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Semester II

Teaching and Evaluation Scheme

Paper Sr. No.	Paper Title	Teaching Schedule (Hours/Week) Lect	Prac	University Exam Theory / Practical Duration | Hrs.	Marks	Internal Exam Theory / Practical Duration | Hrs.	Marks	Total Theory / Practical
201	Maths – II	4	-	3	70	2	30	100
202	Programming in C	4	-	3	70	2	30	100
203	Introduction to Database Management System	4	-	3	70	2	30	100
204	Electronics and Digital Communications	4	-	3	70	2	30	100
205	Business System – I	4	-	3	70	2	30	100
206	Practicals		10	5	140	3	60	200
Total		30			490		210	700

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Semester II

Paper No : 201
Paper Title : Maths – II. L: 4 Hrs

1. **Basic concept of Graph Theory:**
   Definition of (undirected) graphs: Basic Terminology; Types of undirected graphs; Weighted graphs; Multi graphs, Digraphs; Some applications of graph theory: NTLN's Graph isomorphism; Sub graphs; Walks, Paths and Circuits: Connected graphs and components; Operations on graphs; Fusion of vertices.

2. **Trees:**
   Definition of a tree; Some important properties; Cut vertices edges; Distance and center; Rooted and Binary trees; Spanning trees; Kruska's algorithm; Prim's algorithm; computer implementation; connectivity; Shortest path problems; (BFS and Dijkstra's Algorithm); separability.

3. **Euler and Hamiltonian Graphs:**
   Eulerian lines and Euler graphs; Euler's theorem on the existence of Eulerian paths and circuits; Hamiltonian paths and Hamiltonian graphs; The travelling salesman problem; TWO optimal algorithm; The colset insertion algorithm.

4. **Planar graphs:**
   Definition; Plane representation of a graph; Kuratowski's graphs; Euler's formula; Detection of planarity.

5. **Matrix representation of graphs:**
   Incidence matrix; path matrix; Adjacency matrix; Properties; Algorithm (WARSH ALL & MINIMA); Some types of digraphs; Digraphs and binary relation; relation matrix.

Main Readings:

1. N. Deo: Graph Theory with applications to engineering and computer science; Prentice – hall Inc. (1974).
2. K.R. Parthsarthy: Basic Graph theory; Tata McGraw Hill pub. Comp. Ltd; New Delhi (1994)
3. M. Raghavachari: Mathematics for Management-An Introduction: TMH: 2000

Supplementary Reading:

1. F. Harry: Graph Theory; Addison – Wesley Pub. Comp. (1972).
2. J.P. Trembly & R.P. Manohar: Discrete Mathematical structures with applications to Computer Science; McGraw Hill (1975).
3. B. Kolman; R.C Busby & S. Ross: Discrete Mathematical structures; Prentice Hall of India Pvt. New Delhi (2001).

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Semester II

Paper No : 202
Paper Title :Programming in C **L: 4 Hrs**

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1. **Introduction**
   Language, Language Structure, Various options of Compiler
2. **Constants & Variables**
   Character Set, Constants - needs & definition, Variables - needs & definition
3. **Expressions & Operations**
   Operators, Expression, Evaluation & Assignment of Expression, Elementary built-in functions.
4. **Input & Output Functions**
5. **Jumping, Branching & Looping Statements**
6. **String & Mathematical Built-in functions**
7. **User Defined Functions**
   Call by value & by reference, Passing Structures & Arrays, Recursion
8. **Program Structure**
   Storage Classes, Automatic Variables, External (Global) Variables., Static Variables.
9. **Array**
   Defining & Processing an Array., Passing Arrays to a Function, Multidimensional Arrays.
10. **Pointers**
    Pointers and Memory Storage, Operations on Pointers, Arrays of Pointers, Pointer to Array, Passing pointers to functions, I/O statements related to file
11. **Structure & Union**
12. **Data files**
    Opening and Closing a File., Creating a Data File., Processing a Data File., Unformatted Data File.

Main Readings:

1. Byron Gottfried: C Language Programming: TMH: 2nd Ed.: 2001
2. Balaguruswami: Programming in C: TMH: 1992
3. Yashwant Kanitkar: Let Us "C": BPB: 1999

Supplementary Readings:

1. Yashwant Kanitkar: Pointers in "C": BPB: 2001
2. Cooper H. & Mullish H.: The Sprit of "C": JAICO Pub.: 2001
3. Stephan Kochan: Programming in "C": CBS: 1991
4. Kelly & Bootle: Mastering Turbo "C": BPB: 1993
5. Stan Kelly: Mastering Turbo "C": BPB
6. Karnighan & Ritchie: "C" Programming Language: TMH

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Paper No : 203
Paper Title : Introduction to Database Management Systems L: 4 Hrs

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1 Introduction

Traditional File-Based Systems, File Organization, Organization of records in files, Storage Access, Limitations of the File-Based Approach, Data v/s Information

The Database, DBMS, Purpose of DBMS, Applications of DBMS, Advantages and Disadvantages of DBMS

2 Introductory concepts of DBMS

Database Languages, View of Data, Concept of Transactions, Introduction to types of Databases, Database users and DBA

3 Data Models

Introduction to data models, Entity-Relationship model, Basic concepts, Design process, Constraints, Design issues, E-R diagrams, weak entity sets

4 Working with DBMS

Architecture, Objects, Creating a new database, Opening screen, Menu, Toolbars, Opening a Database

Design and Creating tables, Design View and Using Wizard, Primary key and Field Properties, Relationships of two tables, Adding and Editing Records

5 Queries

What is query, Creating a query: Design view and using wizard
Modifying a query
Criteria, Simple Calculated Fields, Summary queries

6 Forms, Reports, Macro in Access

Forms Creating using Design View and using Wizard, Entering Data using forms, Report design using wizard, Report creation from tables and queries, Sections and Graphics Controls in Reports, Macro

Main Readings:

1. C J Date: An Introduction to Database System: Pearson Education: 7th Ed.
2. Henry F. Korth, Abraham Silberschatz, Sudarshan: Database System Concepts: TMH: 4th Ed.: 1997
3. Thomas Connolly, Carolyn Begg: Database Systems – A practical approach to Design, Implementation & Management
4. Courser: Mastering Microsoft Office: BPB: 1999

Supplementary Readings:

1. Jeffery Ullman: Principles of Database Systems: Galgotia Publication: 2001
2. V. K. Jain: Advanced Database Management System: Cyber Tech Publication: 2001
3. Navin Prakash: Introduction to Database Management: TMH: 2000
4. Bipin C. Desai: Introduction to Database System: Galgotia: 2001
5. Bott: Using MS Office: PHI: 2000

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Semester II

Paper No : 204
Paper Title : Electronics & Digital Communications L: 4 Hrs

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1. **Fundamentals of Electrical Engineering**
   Introduction of AC supply, Voltage, Current, Power, Frequency, Phase & DC supply, Passive components, conductors, insulators, Resistor, capacitor, Inductors & their properties, Simple R, L & C circuits., Ohm's Law, Series & parallel connection of resistors & capacitors., Heating effect due to current and need of fuses.
   Terms used in Electromagnetism: Flux, Flux density, Magnetic force, permeability, B-H curve, RC time constant, Electromagnetic Induction & transformer, Resonance
   Different types of signals: Sine, saw tooth, triangular, square wave etc.
2. **Semi conductors, Semiconductor Diode & Transistor (Introductory concepts)**
   Properties of Semiconductors, Commonly used Semiconductors, Intrinsic & Extrinsic semi conductors, P Type & N Type semiconductors, PN Junction & Biasing, Semiconductor Diode, symbol, ratings, forward & reverse bias characteristics,Half wave rectifier, full wave rectifier, bridge rectifier, and simple filter circuits, Zener Diode & its applications PNP & NPN Transistor, Configurations & biasing, Use of transistor in amplifier, switching , oscillators, voltage regulator.
3. **LED, Photo Diode, Photo Transistor, Thermistor, LDR, BCR, & Applications.**
4. **FET, MOSFET symbol & Construction, their Advantages**
5. **Digital communication**
   Analog signals, digital signals, Analog-to-Digital conversion, sampling, electrical reprentation of binary digits, bandwidth, transmission speed, concept of Modulation, need for modulation, Introduction to various modulations: AM, FM, PM, Delta modulation, multiplexing
6. **Introduction to PSK,ASK,FSK**
7. **Introduction to Data transmission.**
   Transmitter, receiver, transceiver, transmission losses

Main Reading:

1. V.K. Mehta: Principles of Electrical Engineering & Electronics: S. Chand: 11th Ed.: 2007
2. Anokh Singh: Fundamentals of Electronics: Khanna Publication: 2000
3. S Haykin: Digital communication: Wiley
4. S Haykin: Analog and Digital Communication: Wiley
5. Taub and Schiling: Digital Integrated Electronics: TMH: 2001

Supplementary Reading:

1. B.L.Theraja: Electrical Technology - (Vol I): S. Chand: 2003
2. Malvino: Digital Principles and Applications: TMH: 5th Ed.: 2002
3. Vincent Del Toro: Electrical Engineering Fundamentals: 2001

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Paper No : 205
Paper Title : Business Systems – I **L: 4 Hrs**

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1. **Elements of Business**
   What is Business? How Business Runs? General Terms of Business
2. **Business Accounting System**
   Basic Concepts of Accounting, Terms of Accounting, Types and rules of Accounting, Journal, Subsidiary Book, Ledger Book, Trial Balance, Profit and Loss, Balance sheet, Accounting Tool
3. **Purchase and Sales System**
   Terms used in Purchase and Sales, Process flow
4. **Manufacturing System**
   Process of Manufacturing, Terms used in Manufacturing like Raw material, Purchase, Production, Warehouse, Cost of product, etc.
5. **Inventory Management System**
   What is Inventory? Terms of Inventory, Reasons to maintain Inventory Ways to maintain inventory, Factors affecting inventory system
6. **Trading Systems**
   What is Trading? Ways of Trading, Process of Trading.

Note: Computerized systems having functionalities of above business systems may be demonstrated during the course of teaching.

Main Readings:

1. R. L. Gupta: Advance Accountancy: S. Chand: 2001
2. Horngren, Sundem: Introduction to Financial Accounting.: Prentice - Hall International
3. Arvind Jain: Inventory Management: RBSA Publishers
4. Adam and Ebert: Production and Operations Management: PHI
5. Donald Dobler: Purchasing and Supply Management: TMH

Supplementary Reading:

1. Murthy: Management Finance, 2nd Edn.: Vakils Fefers & Simons Ltd.: 1978
2. Van Home, James: Financial Management & Policy: Prentice Inc.
3. Heinemann: Elements of Accounting: Kellock: 1978
4. P. Narayan, Jay Subramaniam: Inventory Management: Indus International Publication
5. Khalid Sheikh: Manufacturing Resource Planning: TMH
6. K. Aswathappa, K. Shridhara Bhat: Production and Operations Management: HPH
7. Arnolel: Financial Accounting: Prentice - Hall International.
8. Levy, Sarnat: Principles of Financial Management: Prentice - Hall International.

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Semester II

Paper No : 206
Paper Title : Practicals. P:10 Hrs

Practicals based on subjects no. 202 & 203.