PANJAB UNIVERSITY, CHANDIGARH

Scheme of Examination and Syllabi for B.E. M.B.A. 3\textsuperscript{rd}, 4\textsuperscript{th}, 5\textsuperscript{th} and 6\textsuperscript{th} semester in INFORMATION TECHNOLOGY
(w.e.f. 2010 – 2011)
PROPOSED SCHEME OF EXAMINATION AND SYLLABUS FOR B.E. M.B.A. (Information Technology) 3rd - 6th semesters (w.e.f. 2010-11)

1. The new scheme of Examination and syllabi of B.E. M.B.A. (Information Technology) for third to sixth semester for academic session 2010-11 is as follows:

**SCHEME OF EXAMINATION FOR B.E. M.B.A. (I.T.)**

**Second Year - Third Semester**

<table>
<thead>
<tr>
<th>Subj code</th>
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<tr>
<td>IT302</td>
<td>Data Comm &amp; Networks</td>
<td>3 1 0 4</td>
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<td>IT352</td>
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### SCHEME OF EXAMINATION FOR B.E. M.B.A. (I.T.)

#### Second Year - Fourth Semester

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<td>Management of Information Technology</td>
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<tr>
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<td>Analog &amp; Digital Comm.</td>
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<td>IT403</td>
<td>Microprocessor</td>
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<td>Microprocessor (Prac)</td>
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#### SCHEME OF EXAMINATION FOR B.E.M.B.A. (I.T.)

#### Third Year - Fifth Semester

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<td>Web Technologies</td>
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<td>Human Resource Management</td>
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## SCHEME OF EXAMINATION FOR B.E. M.B.A. (I.T.)

### Third Year - Sixth Semester

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SYLLABUS FOR B.E. M.B.A. (I.T.)
THIRD SEMESTER

Paper Title: Engineering Mathematics-III
Paper Code: AS301 Max. Marks 100 Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Part-A**

**Sequences and Series:** (08)

**Linear Algebra:** (07)
Concept of linear independence and dependence, Rank of a matrix: Row – Echelon form, System of linear equations: Condition for consistency of system of linear equations, Solution by Gauss elimination method. Inverse of a matrix: Gauss – Jordan elimination method (Scope as in Chapter 6, Sections 6.3 – 6.5, 6.7 of Reference 1).
Eigen values, eigen vectors, Cayley – Hamilton theorem (statement only). Similarity of matrices, Basis of eigenvectors, diagonalization (Scope as in Chapter 7, Sections 7.1, 7.5 of Reference 1). (07)

**Part-B**

**Complex Functions:** (08)
Definition of a Complex Function, Concept of continuity and differentiability of a complex function, Cauchy – Riemann equations, necessary and sufficient conditions for differentiability (Statement only). Study of complex functions: Exponential function, Trigonometric functions, Hyperbolic functions, real and imaginary part of trigonometric and hyperbolic functions, Logarithmic functions of a complex variable, complex exponents (Scope as in Chapter 12, Sections 12.3 – 12.4, 12.6 – 12.8 of Reference 1).
Laurent Series of function of complex variable, Singularities and Zeros, Residues at simple poles and Residue at a pole of any order, Residue Theorem (Statement only) and its simple applications (Scope as in Chapter 15, Sections 15.1 – 15.3 of Reference 1). (07)
Conformal Mappings, Linear Fractional Transformations (Scope as in Chapter 12, Sections 12.5, 12.9 of Reference 1). (08)

References:

**Paper Title: Data Communication & Networks**

**Paper Code:** IT302  [Max. Marks 100] [Time: 3 Hours]

**Course Duration:** 45 Lectures of one hour each.

**Note:** Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Part-A**

**Introduction:** (08)
Data Transmission concepts; transmission impairments; switching; Modulation; multiplexing; Network Hardware: LAN, MAN, WAN, Wireless networks, Internet works; Network Software: Layer, Protocols, interfaces and services; Reference Model: OSI/TCP/IP and their comparison.

**Physical Layer:** (08)

**Data Link Layer:** (09)
Framing; Error control; Error correction & Detection; sliding window protocols (one bit, Go back n, selective repeat); Examples of DLL Protocols-HDLC, SLIP; Medium Access Sub layer: Channel Allocation, MAC protocols -ALOHA, CSMA protocols, Collision free protocols, Limited Contention Protocols, Wireless LAN protocols, IEEE 802.3, 802.4, 802.5 standards and their comparison. Bridges: Transparent, source routing, remote.

**Part-B**

**Network Layer:** (09)
Design issues, routing algorithms (shortest path, flooding, flow based, distance vector, hierarchical, broadcast, multicast, for mobile hosts). Congestion control algorithms (Leaky bucket, Token bucket, Choke, Packet, Load shedding).
Transport Layer: 
(06)
Addressing, establishing and releasing connection, flow control & buffering, multiplexing, crash recovery, Internet Transport protocol (TCP and UDP).

Application Layer: 
(05)
Network Security; Domain Name System; Simple Network Management Protocol; Electronic Mail.

Books Recommended:
3. Internet working with TCP/IP by Douglas E. Coomer,(PHI), Edi 3rd.

Paper Title: Data Communication & Networks (Practical)

Paper Code: IT352 Max. Marks: 75 Time: 3 Hours

Practicals based on theory.
1. To familiarize with the various basic tools (crimping, krone etc.) used in establishing a LAN.
2. To familiarize with switch (manageable & unmanageable), hub, connecters, cables (cabling standards) used in networks.
3. To familiarize with routers & bridges.
4. To use some basic commands like ping, trace-root, ipconfig for trouble shooting network related problems.
5. To use various utilities for logging in to remote computer and to transfer files from / to remote computer.
6. To develop a program to compute the Hamming Distance between any two code words.
7. To develop a program to compute checksum for an ‘m’ bit frame using a generator polynomial.
8. To develop a program for implementing / simulating the sliding window protocol.
9. To develop a program for implementing / simulating a routing algorithm.
10. To study various IEEE standards (802.3, 802.4, 802.5, 802.11)
11. To develop a program for implementing/simulation the ALOHA protocol
Paper Title: Object Oriented Programming

Paper Code: IT304 Max. Marks 100 Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Part-A

Principles of Object Oriented Programming (03)
Advantages of OOP, comparison of OOP with Procedural Paradigm

C++ Constructs (03)
Tokens, Expressions and control structures, various data types, and data structures, Variable declarations, Dynamic Initializations, Operators and Scope of Operators, Typecasting, Unformatted and formatted console I/O Operations

Functions (05)
Classes and Objects: Prototyping, Referencing the variables in functions, Inline, static and friend functions. Memory allocation for classes and objects. Arrays of objects, pointers to member functions.

Constructors and Destructors (05)
Characteristics and its various types, Dynamic Constructors, Applications, Order of Invocation, C++ garbage collection, dynamic memory allocation.

Polymorphism (05)
Using function and Operator overloading, overloading using friend Functions, type conversions from basic data types to user defined and vice versa.

Part-B

Inheritance (06)
Derived classes, types of inheritance, various types of classes, Invocation of Constructors and Destructors in Inheritance, aggregation, composition, classification hierarchies, metaclass/abstract classes.

Pointers (05)
Constant pointers, Use of this Pointer, Pointer to derived and base classes, virtual functions, Bindings, Pure virtual Functions and polymorphism

I/O Operations and Files (04)
Classes for files, Operations on a file, file pointers

Generic Programming With Templates (06)
Definition of class template, Function Templates, Overloading Template Functions, Class templates and member functions templates with parameters, Standard C++ classes, persistent objects, streams and files, namespaces, exception handling, generic classes, standard template library: Library organization and containers, standard containers,
algorithm and Function objects, iterators and allocators, strings, streams, manipulators, user defined manipulators and vectors

**Introduction:**
Object Oriented System, Analysis and Design. (03)

**Books Recommended**
1. Object Oriented Programming with C++ by Bala Guruswamy, TMH, Edi 8th.

**Reference Books**

**Paper Title: Object Oriented Programming (Practical)**

Paper Code: **IT 354**  
Max. Marks: 75  
Time: 3 Hours

**List of Experiments:**
1. Implementation of Functions, Classes and Objects
2. Constructors and Destructors
3. Operator Overloading and Type Conversion
4. Inheritance and Virtual Functions
5. Files
6. Exception Handling and Generic Programming

**Paper Title: Digital Electronics**

Paper Code: **IT 305**  
Max. Marks 100  
Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

**Note:** Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Part-A**

**Introduction** (10)

**Number Systems and Codes** (07)
Decimal, Binary, Hexadecimal, Octal’s complement, 2’s complement, addition and subtraction, weighted binary codes, Error detecting codes, Error correcting codes, Alphanumeric codes.

Counters & Shift Registers (07)
Ripple Counters, Design of Modulo-N ripple counter, Up-Down counter, design of synchronous counters with and without lockout conditions, design of shift registers with shift-left, shift-right & parallel load facilities, Universal shift Registers.

Part-B

Data Converters (06)
Sample & Hold switch, D/A converters: weighted type, R-2R Ladder type; A/D Converters: Counter-Ramp type, Dual Slope Type, Successive approximation type, flash type; Specifications of ADC & DAC

Digital Logic families (09)
Characteristics of digital circuits: fan in, fan-out, power dissipation, propagation delay, noise margin; Transistor-transistor Logic(TTL), TTL NAND Gate with active pull up, its input and output Characteristics, Types of TTL Gates (Schottky, standard, low power, high speed). Emitter Coupled Logic(ECL), ECL gate, its transfer characteristics, Level translation in ECL & TTL, MOS Gates, MOS Inverter, CMOS Inverter, Rise & Fall time of MOS & CMOS gates, Interfacing TTL & CMOS Circuits, Comparison of Characteristics of TTL, ECL, MOS & CMOS logic circuits, Tristate Logic & its applications.

Semiconductor Memories & Programmable Logic (06)
ROM, PROM, EPROM, EEPROM; RAM: Static RAM, Typical Memory Cell, Memory Organisation, Dynamic RAM cell, Reading, & Writing Operation in RAM, PLA, PAL & FPGA.

Books Recommended:

4. Integrated Electronics by Millman & Halkias, (Tata McGraw-Hill), Edi 1st
5. Digital System Principles & Applications by R J Tocci (PHI), Edi 10th.

Paper Title: Digital Electronics (Practical)

Paper Code: IT 355 Max Marks: 75 Time: 3 Hours

Note: Do any eight experiments.
1. To study data sheets and truth tables of AND, OR, NOR, NAND, NOT and XOR gates.
2. To verify the truth tables of RS, D, JK and T Flip Flops.
3. To fabricate and test the truth table of half/full adder.
4. To design and implement a Modulo-N Counter.
5. To Design and implement a Universal shift register.
8. To convert 8 bit Digital data to Analog value using DAC.
9. To convert Analog value into 8 bit Digital data using ADC.
10. To design and fabricate the given sequential circuits using Flip-flops as memory elements.

Paper Title: Organization Behavior (Theory)

Paper Code: IBM 301

Max. Marks 100

Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Part A

Introduction to Organization Behavior [10]

Definition and meaning of OB, impact of other sciences (Anthropology, Sociology, Psychology) on OB, perception, self esteem, attitude & personality, meaning of culture, impact of technology on OB.

Motivation, Learning & Leadership [13]

Meaning of Motivation, Content theories of motivation (Maslows Hierarchy of needs, Herzberg’s two factor theory), Process theories (Vroom’s Expectancy theory, Porter-Lawler Model), Motivation applied (Job design, job rotation, goal setting, MBO), various methods of motivating employees, Behavioral & Cognitive theories of learning, Leadership theories (Trait theory, Fiedler’s Contingency theory, Path–Goal leadership theory), Leadership styles (Blake & Mouton managerial grid, Hersey & Blanchard’s life cycle approach).

Part B

Group behavior: [10]

Group Dynamics, conflict, power & politics, Group behavior, types of groups, group decision making, conflict in organizations and reason, interpersonal conflict, inter group conflict, meaning of power, classification of power, politics in organizations.

Organization environment & Communication [12]

Authority & responsibility, delegation and division of work, quality of work life, communication process, modes of communication in organization and barriers to communication, formal & informal communication.

Recommended Books:
SYLLABUS FOR B.E. MBA (IT)
FOURTH SEMESTER

Paper Title: Data Structures and Algorithms (Theory)

Paper Code: IT 401 Max. Marks 100 Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Part-A

Introduction: (01)
Introduction to data structures; Introduction to Algorithms Complexity;

Arrays, Stacks & Queues: (08)
Concepts; Basic operations & their algorithms: Transverse, Insert, Delete, Sorting of data in these data structures; Prefix, Infix, Postfix Notations;

Lists: (10)
Concepts of Link List and their representation; Two way lists; Circular link list; Basic operations & their algorithms: Transverse, Insert, Delete, Searching and Sorting of data in List; Storage Allocation & Garbage Collection; Linked stack and queues; Generalized List; sparse matrix representation using generalized list structure;

Part-B

Trees: (08)
Binary Trees and their representation using arrays and linked lists; Trees and their applications; Binary tree transversal; Inserting, deleting and searching in binary trees; Heap & Heap Sort; General Trees; Thread binary tree; Height balance Tree (AVL); B-Tree.

Graphs and their applications: (08)
Graphs; Linked Representation of Graphs; Graph Traversal and spanning forests; Depth first search; Breadth first search.

Sorting & Searching: (10)
Insertion sort; Selection sort; Merging; Merge sort; Radix sort; Sequential & Binary Search; Indexed Search; Hashing schemes; Binary search Tree.

Books Recommended:
Paper Title: Data Structures and Algorithms (Practical)

Paper Code: IT 451  Max. Marks: 75  Time: 3Hrs

List of Programs:
1. **Implementation of Array Operation**: Traversal, Insertion & Deletion at and from a given location; Sparse Matrices; Multiplication, addition.
2. **Stacks**: Implementation of Push, Pop; Conversion of Infix expression to Postfix, Evaluation of Postfix Expressions.
3. **Queues**: Adding, Deleting Elements; Circular Queue: Adding and Deleting elements.
4. **Implementation of Linked Lists**: Inserting, deleting, inverting a linked list. Implementation of stacks and queues using linked lists; Polynomial addition, Polynomial multiplication.
6. **Graphs**: BFS & DFS
7. Implementation of sorting and searching algorithms.
8. **Hash Tables Implementation**: Searching, inserting and deleting, searching & sorting techniques.

Paper Title: Analog and Digital Communication

Paper Code: IT 402  Max. Marks 100  Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

**Note**: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Part-A**

**Amplitude Modulation & Demodulation and Systems** (08)

**Frequency Modulation & Demodulation and Systems** (07)
Principles and generation of FM and PM signals, FM Transmitter and FM receiver with various stages

**Pulse Modulation & Demodulation** (08)
Principles, generation and detection of PAM, PWM, PPM & PCM signals, noise in pulse modulation system, companding, delta modulation, adaptive delta modulation systems.
Part-B

Digital modulation techniques
PSK, FSK, MSK, QAM. Error calculations for PSK, FSK, MSK, QAM, Shannon’s limit, Signal to Noise Ratio

Multiplexing and Multiple Access
Allocation of communication Resources, FDM/FDMA, TDM/TDMA, CDMA, SDMA, Multiple Access Communications and Architecture, Access Algorithms.

Spread Spectrum Techniques

Books Recommended:
7. Electronic Communications by Dennis Roddy and John Coolen, PHI, Edi 4th.

Paper Title: Analog and Digital Communication (Practical)

Paper Code: IT 452 Max. Marks: 75 Time: 3 Hours

1. To measure the modulation Index of AM signals using Trapezoidal Method.
2. To study the voltages and waveforms of various stages of an AM Superheterodyne Receiver.
3. To measure the sensitivity and selectivity of an Superheterodyne Radio Receiver.
4. To measure the fidelity of an AM Superhetrodyne radio Receiver.
5. To study DSB/SC AM signal and its demodulation using Product Detector Circuit
   (i) with dedicated wire
   (ii) with antenna
6. To study the Frequency modulation and Demodulation circuits.
7. To study the Pulse Code Modulation (PCM) and de-modulation circuits.
8. To study the Time Division Multiplexing (TDM) and De-multiplexing circuits.
9. To study delta and Sigma Delta modulation, demodulation circuits.
Paper Title: Microprocessor (Theory)

Paper Code: IT 403 Max Marks:100 Time : 3Hrs

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Part-A

Microprocessor Architecture and Microcomputer Systems: (05)
Microprocessor Architecture, The 8085 MPU: Block Diagram, Pin Diagram, Adress/Data Buses, Concept of demultiplexing of Buses, Control and status signals, Registers, Ports, Flags, Instruction Decoding and Execution, memory Interfacing.

Interfacing I/O Devices (06)
Basic Interfacing Concepts, Interfacing Output Displays, Interfacing Input Devices, Memory- Mapped I/O

Programming the 8085: (06)

Programming Techniques with Additional Instructions: (07)

Part-B

Counters and Time Delays: (06)
Counters and Time Delays, Hexadecimal Counter, Modulo Ten, Counter, Generating Pulse Waveforms, Debugging Counter and Time-Delay Programs.

Stack and Subroutines: (04)
Stack, Subroutine, Conditional Call and Return Instructions.

Interrupts: The 8085 Interrupt, 8085 Vectored interrupts. (04)

General –Purpose Programmable Peripheral Devices: (07)
Block Diagram, Working and Control word of: The 8255A Programmable Peripheral Interface, The 8259 A Programmable Interrupt Controller, Programmable communications interface 8251.
Books Recommended
1. Microprocessor Architecture, Programming and Applications with the 8085 by Ramesh S.Gaonkar, PenRam, Edi 5th.

Reference Books:
1. Advanced Microprocessor & Interfacing by Badri Ram, Tata McGraw Hill, Edi 1st.
2. Microprocessor Principles and Applications by Charles M. Gilmore, TMH Edi 3rd
3. Microprocessors and Interfacing programming and Hardware by Douglas V. Hall, TMH, Edi 2nd

Paper Title: Microprocessor(Practical)
Paper Code: IT 453  Max Marks: 75  Time: 3Hrs
1. Familiarization of 8085 kits.
2. Verification of arithmetic and logic operations using above kits.(At least 5 programs)
3. Development of interfacing circuits of various control applications based on 8085.
4. Application of assembly language using 8085 instructions set to develop various programs.
5. Applications of data movement instructions to develop relevant programs.

Paper title: Computer Architecture & Organization
Paper Code: IT 404  Max Marks: 100  Time: 3Hrs
Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Part-A
Design Methodology (04)
System design, Design levels- Gate level, Register level, Processor level.

Basic Computer Organization & Design (08)
Instruction codes, common bus system, computer instruction, Design of basic computer, Design of accumulator logic.

Control Design (08)
Basic concepts, Hardwired control, Micro programmed control, Design of control unit.

Central Processing Unit (08)
Part-B

Input-Output Organization (06)
I/O interface, Modes of transfer, Priority interrupts, DMA, I/O processor.

Memory Organization (06)
Memory hierarchy, Main memory, Auxiliary memory, Associative memory. Cache memory, virtual memory, Memory management H/W.

Parallel Processing (05)
Introduction, Multiprocessors, Interconnection structure.

Books Recommended
2. Computer System Architecture by Morris Mano, Edi 3rd PHI

Reference Books

Paper Title: Management of Information Technology (Theory)
Paper Code: IBM 401 Max. Marks 100 Time: 3 Hours
Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Part A

Information Technology (IT) [8]
IT and society, IT infrastructure in India vis-à-vis developed nations (Telecommunication, Internet reach, PC, Broadband, Mobile Phones), IT applications in Healthcare & Education, meaning of E-Readiness and E-participation index as defined by United Nations, areas where growth is expected in future.

System Investigation & Analysis, Networking [8]
System Analysis & Design, Symbols used in modeling a business process, Networking concepts, Ethernet, IP addressing, Functioning of Routers, Bridges, hubs and switches in a network, Telecommunication (GSM, CDMA, Wireless and other new technologies)

Internet & Intranet [7]
Functioning of Internet, Encryption & Digital signatures, Firewalls, Fraud on the Internet, Virus, Hacking & Denial of Service attacks, Intellectual Property Protection on the Internet, Intranet & security
Part B

E-Commerce & E-Governance
E-Commerce models, Intermediaries in E-Commerce, E-Governance in India, study of successful E-Governance models like E-Choupal, E-Payments (E-Cash, E-Wallets) and major players in the area, Online Shopping, Revenue models for Online Shopping Portals, Web Auctions like eBay, dealing with E-Waste.

Knowledge Management & Business Intelligence
Meaning of Knowledge Management, Designing a Knowledge Management System, Nature & Scope of Business Intelligence, Software for Business Intelligence, Data Warehousing and Data Mining techniques.

Recommended Books:
SYLLABUS FOR B.E. MBA (IT)  
FIFTH SEMESTER

Paper title: Web Technologies

Paper Code: IT 501  
Max. Marks: 100  
Time: 3 hours

Course Duration: 45 lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Part-A

Internet Basics: (07)
Internet; Communication on the Internet; Internet services; types of accounts; Internet Domains; NIC; IP addresses; Web Servers; review of TCP/IP; HTTP; telnet; ftp; WWW concepts; web site creation concepts; web commerce; internet telephony.

HTML: (08)
HTML basics; HTML tags; text formatting; text styles; lists: ordered, unordered and definition lists; layouts; adding graphics; tables; linking documents; images as hyperlinks; frames and layers; DHTML, style sheets.

Java Script: (06)
Advantages of JavaScript; writing JavaScript into HTML; JavaScript data types, variables, operators and expressions; arrays and functions in JavaScript; condition checking; loops; dialogue boxes.

Part-B

Advanced Java Script: (08)
JavaScript document object model; JavaScript assisted style sheets; events handling in JavaScript; browser objects; form objects; built-in and user defined objects; cookies.

ASP: (16)
Origin of ASP; how ASP works; ASP Objects, Application object; ASP Error object; Request object; Response object; server object; session object; Scripting objects; Active Server Components; ActiveX Data Objects, Comparison with CGI-Perl, JSP and PHP.

Books Recommended:

Paper title: Web Technologies (Practical)

Paper Code: IT 551  
Max. Marks: 75  
Time: 3 hours

Practical based on theory.
Paper title: Data Base Management Systems

Paper Code: IT 502  Max. Marks: 100  Time: 3 hours

Course Duration: 45 lectures of one hour each.

**Note:** Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Part-A**

**Data Base Concept:**
Data Base Vs file oriented approach, Basic DBMS terminology, Data independence, General Architecture of a Data Base Management Software, Components of DBMS.

**Data Base Design:**
Introduction to Data Models, Entity Relationship Model, Entities, Attributes, E-R Diagrams, Conceptual Design of a relational data base model.

**Data Normalization:**
Introduction, Keys, First Normal Form, Second Normal form, Third Normal form, Boyce Codd Normal form, Denormalization, case studies of Data Normalization

**Transaction Processing Concepts:**
Schedules and recoverability, serializability, locking techniques, timestamp ordering, granularity, multiversion concurrency control.

**Part-B**

**Structured Query Language (SQL):**
Introduction to SQL, Data types, Querying database tables, Conditional retrieval of rows, Working with Null Values, Matching a pattern from a table, Ordering the Result of a Query, Aggregate Functions, Grouping the Result of a Query, Insert statement, Update & Delete statement, Alter & Drop statements, Querying Multiple Tables: Joins, Equi Joins, Inner Joins, Outer Joins, Self Joins; SET Operators: Union, Intersect, Minus; Nested Queries. Functions: Arithmetic, Character, Date and General Functions; Group Functions

**Data Manipulation and Control:**
Data Definition Language (DDL), Creating Tables, Creating a Table with data from Another table, Inserting Values into a Table, Updating Column(s) of a Table, Deleting Row(s) From a Table, Dropping a Column, Introduction to VIEWs, Manipulating the Base table(s) through VIEWs, Rules of DML Statements on Join Views, Dropping a VIEW, Inline Views, Materialized Views. Database Security and Privileges, GRANT Command, REVOKE Command, COMMIT and ROLLBACK.

**PLSQL:**
Introduction to PL/SQL, PL/SQL Block Structure, PL/SQL Architecture, Fundamentals of PL/SQL, PL/SQL Data Types, Variables and Constants, Scope and Visibility of a

**Relational Queries:**

Relational Algebra and Calculus, Preliminaries, Relational Algebra, Relational Calculus, Expressive Power of Algebra and Calculus, Points to review.

**Books Recommended:**

1. An Introduction to Database Systems by C.J. Date, Pearson, Edi 8th.

**Reference books:**

5. Introduction to Data Base Systems by Desai, Bipin C. (Galgotia Publications), Edi 3rd.

**Paper title: Data Base Management Systems (Practical)**

Paper Code: **IT 552**

Max. Marks: 75

Time: 3 hours

**Practical based on Theory.**

**Paper Title: Wireless Communication**

Paper code: **IT 503**

Max. Mark : 100

Time: 3 Hours

Course Duration: 45 lecturers of one hour each

**Note:** Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Part-A**

**Introduction**

Evolution of Mobile Communication Systems, Paging systems, cordless telephone systems, cellular telephone systems, comparison of common wireless communication systems.
System Design Fundamentals
Frequency reuse, Channel assignment strategies, handoff strategies, interference, improving coverage and capacity in cellular systems, mechanism for capacity improvement-cell splitting, cell sectoring and microcell zone concept, modulation techniques.

Wireless Systems
GSM, GSM reference architecture and GSM security architecture, CDMA digital cellular standard, IS-95 system.

Part-B
Channel Impairment Mitigation Techniques
Introduction, Power control, Diversity Techniques: Frequency Diversity, Time Diversity, Space Diversity, Path Diversity, Channel Equalization, Rake receiver, Channel coding and interleaving.

Multiple Access Techniques
Simplex, Duplex, Time Division Duplex, Frequency Division Duplex FDMA, TDMA, CDMA, SDMA, OFDM, Hybrid Multiple Access.

Migration to 3G technologies:
WiFi, WiMax, EDGE, Bluetooth, CDMA-2000.

Books Recommended:

Paper Title: Wireless Communication (Practical)
Paper code: IT 553 Max. Marks : 75 Time: 3 Hours
Practical based on theory.

Paper title: Operating Systems
Paper Code: IT 504 Max. Marks: 100 Time: 3 hours
Course Duration: 45 lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.
Part-A

**Basic Functions and Concepts of Operating Systems:** (05)
Concept of an operating systems, batch system, Multi-programmed, Time sharing, Personal Computer System, Parallel system, Real time system, General system Architecture.

**Features and Objectives of Operating Systems:** (11)
System components, operating system services, System calls, System Programs, System Structure, System design and implementation. Concept of process, process states, process state transition, process control block, operations of processes, concurrent processes, deadlocks, scheduling algorithms, scheduling criteria, Process Synchronization.

**Memory Management:** (06)
Logical and physical address space, storage allocation and management techniques, swapping, concepts of multi programming, paging, segmentation, virtual storage management strategies, Demand Paging, Page Replacement Algorithms, Thrashing.

Part-B

**Information Management:** (06)
File concept, Access method, Directory structure, Protection File system structure, Allocation methods, Free space management, Directory implementation, Disk structure, Disk Scheduling, Disk management, Swap space management.

**Distributed-System Structures:** (06)
Network operating system, Distributed operating systems, Remote services, Robustness, Design Issues.

**Distributed file systems and Distributed Coordination:** (06)

**Case Studies:** (05)
Unix O.S. Architecture, Operating system services, user perspective, representation of files in Unix system processes and their structure, Input-output system, Memory management, Unix shell, history and evolution of Unix system.

**Books Recommended:**


**Reference books:**

Paper title: Operating Systems (Practical)

Paper Code: IT 554  Max. Marks: 75  Time: 3 hours

**Practical based on theory.**
1. Installation of the Linux operating system
2. Working with text editor ‘vi’
3. Using basic commands-man,who,more,pipe,finger,cat,redirect,ls,cp,mv,rm.
4. Working with directory and plain files-pwd,cd,mkdir,rmdir,lp,wc,date,cal,sort,diff,uniq and grep commands.
5. Using miscellaneous commands-head,tail,cut,copy,paste,spell,find and bc.
6. Working with shell scripts under Korn Shell and using shell variables, print, chmod and calendar commands.
7. Additional features of Korn shell such as profile, kshrc file, history, read and command line editing commands, aliases and special characters in print command
8. Using quotes, relational operators, command substitution, arithmetic functions, shell control statements such as for-in, if-then-elseif-else, while,case,date and script.
9. Working under the Bourne shell-shell scripts, control statements such as test, for, for in, if-then-else-fi, -if-then-elif-fi, while,until, case, relational operators and expressions.

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**Paper Title: Marketing Management**

Paper Code: IBM 501  Max. Marks 100  Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

**Note:** Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Objectives:** (i) To understand the nature, tasks and the environment under which marketing operates. (ii) To study the theory, principles and practical aspects of various marketing functions. (iii) To learn to take marketing decisions.

**Part A**

**Introduction to Marketing:**
Definition; Scope and Importance of Marketing; Key Customer Markets; Concepts/Philosophies of Marketing; Holistic Marketing Concept; Marketing Tasks; Marketing Mix

**Marketing Environment:**
Marketing Environment; New Marketing Realities; New Consumer Capabilities; Demographic Environment; Social-Cultural Environment; Natural Environment; Technological Environment and Political-Legal Environment; SWOT analysis.
Analyzing Markets:
Marketing Research Process; Sources of data collection; factors influencing consumer behavior; buying decision process; post-purchase behavior; Organizational Buying; Stages in the Buying Process.

Market Segmentation:
Levels of market segmentation; segmenting consumer markets; Niche Marketing; segmenting business markets; Michael Porter’s five forces model; Analyzing competitors; strategies for market leaders; Targeting and Positioning.

Part B

Product Decisions:
Product characteristics; classifications; differentiation; packaging and labeling; Product Life Cycle.

Pricing Strategies:
Understanding Pricing; Setting the Price; Initiating and Responding to Price Changes; Reactions to Competitor’s Price Changes.

Marketing Channels:
Marketing Channels; Role of Marketing Channels; Identifying Major Channel Alternatives; Types of Intermediaries; Channel-Management Decisions, Retailing, Wholesaling.

Marketing Communication:
The Role of Marketing Communications; Communications Mix-Advertising, Sales Promotion, Public Relations and Publicity, Events and Experiences, Direct and Interactive Marketing, Personal Selling.

References:
Paper Title: Human Resource Management
Paper Code: IBM 502
Max. Marks 100
Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Objectives: The objective of the paper is to make student aware of the various functions and importance of the HR department in any organization. It is basically concerned with managing the human resources, whereby the underlying objective is to attract retain and motivate the human resources in any organization, which is the most challenging and daunting look for any organization today.

Part A

Introduction: [5]
Meaning, scope, objectives and functions of HRM; Importance of Human Resource Management; HRM & HRD a comparative analysis;

Environment of HRM: [5]
Role of government, internal and external forces; Human Resource Management practices in India.

Definition, objectives, process and importance; Job analysis, description, specification & job evaluation; Recruitment, selection, placement and induction process;

Human Resource Development: [6]
Concept, Employee training & development; Career Planning & development; Promotions, demotions, transfers, separation, absenteeism & turnover;

Part B

Job Compensation: [6]
Wage & salary administration, incentive plans & fringe benefits.

Performance Management: [6]
Concept & process, performance appraisal, Potential appraisal;

Quality of work life (QWL): [6]
Meaning, techniques for improving QWL.

Industrial Relations: [6]
Concept and theories, trade unions; Health, Safety & Employee welfare measures; Employee grievances and discipline, participation & empowerment; Introduction to collective bargaining.

References:

Paper Title: **Industrial Training**  
Paper Code: **IT 506**  
Training Duration: 4 to 6 weeks

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**SYLLABUS FOR B.E. M.B.A. (I.T.)**  
**SIXTH SEMESTER**

**Paper Title: Computer Graphics**

Paper code: **IT 601**  
Max. Marks : 100  
Time: 3 Hours

Course duration: 45 lecturers of one hour duration each

**Note:** Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Part-A**

**Introduction to computer graphics**  
Applications of computer graphics, Picture representation, color table, Video Display Devices- Raster Scan Systems, Random Scan Systems, Input Devices, Output primitives

**Raster Scan Graphics:**  
Scan conversion, Frame buffer, Bresenham's line and circle drawing algorithms, Scan-Line Polygon Fill Algorithm, Inside-Outside Tests, Boundary-Fill Algorithm, Flood-Fill Algorithm, Antialiasing and Halftoning, Character Generation, Attributes of lines

**Segments:**  
Segments table, creating deleting and renaming segments, visibility, image transformations.

**Transformations:**  
Geometric Transformations: Matrices, Translation, Scaling, Rotation, Homogeneous Coordinates, Composite Transformation Matrix, Coordinate Transformation, Rotation about an arbitrary point, Inverse Transformations, Other transformations.

**Part-B**

**Windowing and clipping:**  
Three Dimension: (05)
3D geometry, 3D primitives, 3D transformations, rotation about arbitrary axis, parallel projection, perspective projection, viewing parameters, conversion to view plane coordinates

Hidden Line and surface: (05)
Back face removal algorithms, hidden line methods

Text Book:

Reference Books:

Paper Title: Computer Graphics (Practical)
Paper code: IT 651
Max. Marks : 75
Time: 3 Hours

Practical based on theory.

Paper title: Software Engineering
Paper Code: IT 602
Max. Marks : 100
Time: 3 Hours

Course duration: 45 lecturers of one hour duration each

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Part-A

Software Evolution (06)

Project Management Concepts (04)

S/W Project Planning (04)
Project estimation, Empirical Estimation Models, COCOMO Model.
Risk Management

Reactive Vs Proactive risk strategies, s/w Risks, Risk Identification, Projection, Risk Mitigation, Monitoring and Management.

S/W Quality Assurance

S/w quality concept, SQA- S/w quality assurance activities, reviews, SQA plan, ISO 9000 Quality standards, ISO approach to quality assurance systems.

Part-B

S/W Configuration Management
Baselines, S/w configuration Items, SCM process, Version control, Change control.

Design
Design Concepts and principles, Modular Design, Design Methods.

S/W Testing Methods
Testing Fundamentals, test case design, White box testing, Black Box testing, Testing Strategies, Verification & validation, Unit, Integration, Validation, System Testing.

Computer aided S/W Engineering
CASE, Building blocks For Case, Integrated Case Environment.

Books Recommended


Reference Books


Paper Title: Software Engineering (Practical)
Paper Code: IT 652 Max. Marks 75 Time:3 Hours

Practical based on theory.

Paper title: Network Security & Cryptography

Paper Code: IT 603 Max. Marks: 100 Time: 3 hours

Course duration: 45 lecturers of one hour duration each

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two
questions from Part-A and two from Part-B.

**Part-A**

**Basic Encryption and Decryption:** (05)

Attackers and Types of threats, challenges for information security, Encryption Techniques, Classical Cryptographic Algorithms: Monoalphabetic Substitutions such as the Caesar Cipher, Cryptanalysis of Monoalphabetic ciphers, Polyalphabetic Ciphers such as Vigenere, Vernam Cipher

**Stream and Block Ciphers:** (07)


**Number theory and basic Algebra:** (04)

Modular Arithmetic, Euclidean algorithm, Random number generation

**Key Management Protocols:** (04)

Solving Key Distribution Problem, Diffie-Hellman Algorithm, Key Exchange with Public Key Cryptography.

**Part-B**

**Public Key Encryption Systems:** (08)


**Hash Algorithms:** (05)

Hash concept, description of Hash Algorithms, Message Digest Algorithms such as MD4 and MD5, Secure Hash Algorithms such as SH1 and SHA2

**Network Security:** (04)


**Web Security:** (04)

Web security consideration, secure socket Layer protocol, Transport Layer Security Secure Electronic Transaction Protocol

**Firewalls:** (04)

Firewall Design principles, trusted systems, Virtual Private Networks.

**Books Recommended**

Reference Books:


Paper title: Network Security & Cryptography (Practical)

Paper Code: IT 653 Max. Marks: 75 Time: 3 hours

Practical based on theory.

Paper Title: Multimedia Systems

Paper Code: IT 604 Max. Marks: 100 Time: 3 hours

Course duration: 45 lecturers of one hour duration each

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Part-A

Introduction: (05)

Multimedia Technology: (06)

Storage Media: (05)
Magnetic and Optical Media, RAID and its levels, Compact Disc and its standards, DVD and its standards, Multimedia Servers.
Audio: (05)
Basics of Digital Audio, Application of Digital Audio, Digitization of Sound, Sample Rates and Bit Size, Nyquist's Sampling Theorem Typical Audio Formats Delivering Audio over a Network, Introduction to MIDI (Musical Instrument Digital Interface), Components of a MIDI System, Hardware Aspects of MIDI, MIDI Messages

Part-B

Image, Graphics and Video: (06)

Video and Audio Compression: (12)

Multimedia Communication: (06)
Building Communication network, Application Subsystem, Transport Subsystem, QOS, Resource Management, Distributed Multimedia Systems

Books Recommended:


Reference Books:


Paper Title: Multimedia Systems (Practical)

Paper code: IT 654 Max. Marks: 75 Time: 3Hrs

Practical related to all of the following

1. Multimedia Authoring Systems
2. Programming in Multimedia Authoring Systems
3. Creating Presentation using Flash Media
4. Designing Hypertext and Hypermedia Systems
5. SMIL
6. Programming in Multimedia API in any Language
7. Programming of Various Compression Standards
8. Multimedia System Design Project For Application areas such as Education, Sales, Medical, Communication, Marketing etc

Paper Title: **Managerial Economics**
Paper Code: **IBM 601**
Max. Marks 100

Course Duration: 45 Lectures of one hour each.

**Note:** Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

**Objectives:** To provide students with an understanding of basic economic principles of production & exchange-essential tools in making business decisions in today’s global economy. The object presents the foundation to understanding how the economy works, covering microeconomic description of business applications, including pricing for profit maximization, price elasticity, market structures and modeling of business in varying economic climates. The focus is on market economics, the organization that operation there and their business strategies.

**Part A**

**Introduction to Managerial Economics:** [4]
Nature Scope and Importance of Managerial Economics, opportunity costs, incremental principle, time perspective, discounts and equi marginal principles.

**Demand Concepts and Analysis:** [4]
Individual Demand, Market Demand, Kinds of Demand, Determinants of Demand, Demand Functions, Functions, Demand Schedule and Law of Demand.

**Theory of Consumer Behavior:** [4]
Cardinal Utility Approach and Ordinal Utility (Indifference Curves) Approach;

**Elasticity of Demand:** [4]
Concept, Types, Measurement and importance.

**Demand Forecasting:** [5]
Sources of Data-Expert Opinions, Surveys and Market Experiments; Time Series Analysis-Trend Projection; Barometric Forecasting-Leading Indicators, Composite and diffusion Indices.

**Part B**

**Production Function:** [4]
Concept and types, Returns to Factor and Returns to Scale, Law of Variable Proportions.

**Cost Concepts and Analysis:** [4]
Concept of Cost, Short run and Long-run Cost Curves, Relationships among various costs, Break-even Analysis.

**Revenue Curves:**
Concept and Types.

**Perfect Competition:**
Characteristics, Equilibrium Price, Profit Maximizing output in Short Run and Long Run;

**Monopoly:**
Characteristics, Equilibrium Price, Profit Maximizing output in Short Run and Long Run; Price Discrimination;

**Imperfect Competition:**
Monopolistic Competition, oligopoly and Barriers to Entry.

**References:**
3. Dr. V.Panduranga Rao: Microeconomics-IBS Publication

**Paper Title: Corporate Legal Environment**
**Paper Code: IBM 602**
Max. Marks 100 Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

**Note:** Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.
Objective: Corporate legal environment represents that external environment in which the organization has to work. The course covers the basic laws which a student must be aware of.

Part A

Objective of the act, documents excluded from the scope of the act, digital signatures, types of digital signatures in India, certifying authorities in India, regulation of certifying authorities, duties of subscribers, offences, appellate tribunal, penalties and adjudication

Definition and nature of a company, kinds of companies, formation of a company, memorandum of association, articles of association, prospectus, membership in a company, shares, transfer and transmission of shares, meetings and proceedings.

Part B


Consumer Protection Act 1986: [12]
Definitions under the act: complaint, consumer, defect, deficiency, unfair trade practice, consumer protection councils, redressal machinery under the act, district forum, state commission, national commission

References:

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