PANJAB UNIVERSITY, CHANDIGARH

Scheme of Examination and Syllabi for B.E. M.B.A 3rd, 4th, 5th, 6th, 7th, 8th, 9th and 10th semester in INFORMATION TECHNOLOGY
(Academic Session 2014 ï 2015)
## Proposed Scheme of Examination and Syllabi for B.E. M.B.A (Information Technology) 3rd to 10th Semesters for AS 2014-15

### Second Year - Third Semester

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*- Note: Marks refer to mid semester evaluation and end semester evaluation

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*Note: Marks refer to mid semester evaluation and end semester evaluation*
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**Note:** Marks refer to mid semester evaluation and end semester evaluation

**Elective-I* Choose any one from the following:**
- Artificial Intelligence
- Mobile Computing
- Building Enterprise Applications
Fourth Year - Eighth Semester

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**Elective II**

Choose any one from the following:
- Object Oriented Analysis and Design
- Software Testing and Quality Assurance
- System Simulation and Modeling

**Elective III**

- Theory of Computation
- Soft Computing
- Mobile Apps Development
## Fifth Year - Ninth Semester

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STUDENTS HAVE TO SELECT 3 SUBJECTS FROM THE MAJOR SUBJECT AND 3 FROM MINOR
Fifth Year - Tenth Semester

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STUDENTS HAVE TO SELECT 2 SUBJECTS FROM THE MAJOR SUBJECT AND 2 FROM MINOR
SYLLABUS FOR B.E. M.B.A (I.T.) THIRD SEMESTER

Paper Title: Engineering Mathematics-III

Paper Code: ASC301  Max. Marks (Univ. Exam): 50  Time: 3 Hours
Credits : 04  Max. Marks (Int. Exam): 50  Total Lectures: 45

L  T  P  3 1 0

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: To teach computer based Engineering Mathematics to students. After this course, the student will be able to solve complex computer oriented problems.

Part-A

Sequences and Series:

(08)
Sequences, Limits of sequences, Infinite series, series of positive terms, Integral test, Comparison test, Ratio test, Root test. Alternating series, Absolute and Conditional Convergence, Leibnitz test. Power series: radius of convergence of power series, Taylor\'s and Maclaurin\'s Series, Formulae for remainder term in Taylor and Maclaurin series, Error estimates. (Scope as in Chapter 8, Sections 8.1 \textendash} 8.10 of Reference 2).

Linear Algebra:

(07)
Concept of linear independence and dependence, Rank of a matrix: Row \textendash} Echelon form, System of linear equations: Condition for consistency of system of linear equations, Solution by Gauss elimination method. Inverse of a matrix: Gauss \textendash} Jordan elimination method (Scope as in Chapter 6, Sections 6.3 \textendash} 6.5, 6.7 of Reference 1).
Eigen values, eigen vectors, Cayley \textendash} 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 \textendash} 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 \textendash} 12.4, 12.6 \textendash} 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 \textendash} 15.3 of Reference 1).

(07)
Conformal Mappings, Linear Fractional Transformations (Scope as in Chapter 12, Sections 12.5, 12.9 of Reference 1).

References:

Paper Title: Analog and Digital Communication

Paper Code: IT322
Credits : 04
Max. Marks (Univ. Exam): 50
Max. Marks (Int. Exam): 50
Time: 3 Hours
Total Lectures: 45
L T P 3 1 0

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: To study about the various modulation techniques and to understand about the modulation techniques used for digital data transmission as well as to have the knowledge about the digital communication, spread spectrum and multiple access techniques.

Part-A

Amplitude Modulation & Demodulation and Systems


Frequency Modulation & Demodulation and Systems

Principles and generation of FM and PM signals, FM Transmitter and FM receiver with various stages

Pulse Modulation & Demodulation

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

Spread Spectrum Overview, Pseudonoise Sequences, Direct Sequence and Frequency Hopped Systems, Synchronization of DS and FH systems, Jamming Considerations, Commercial Applications

Books Recommended:
7. Electronic Communications by Dennis Roddy and John Coolen (PHI), Edi 4th
Paper Title: Analog and Digital Communication (Practical)

Paper Code: IT 372
Credits: 2
MM: 50

**Objective:** To have practical knowledge about various circuits for different modulation techniques used for digital data transmission as well as to impart knowledge about the digital communication.

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 a Superheterodyne Radio Receiver.
4. To measure the fidelity of an AM Superheterodyne 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: ORGANIZATION BEHAVIOR

Course: BE-MBA IIIrd Semester

Paper – Compulsory

Paper Code: IBM-301

Credits: 03

Times: 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: To introduce the student to the concept of human behavior and also organization behavior. Important concepts like perception, leadership, motivation etc are introduced to build a foundation for understanding organization working environment.

Internal Assessment: 50

External Assessment: 50

Part-A


Perception: Factors Influencing perception- perceptual selectivity Linkage between perception and Individual decision making-ethics in decision making. (4)

Personality and Emotional Quotient (EQ): The meaning of personality, its determinants-personality Traits; The big five model, Emotional quotient. (5)

Motivation & Morale: Concepts to Applications. (2)


Part-B


Conflict & Inter Group Behavior & Collaboration: Sources of Conflict, Intra-individual Conflict, Interpersonal Conflict, Inter-group behavior and Conflict, Organizational Conflict, Negotiations-Approaches to Conflict Management-Collaboration.


References

1. Behavior in Organizations ,Greenberg, Baron , PHI
3. Organization Behavior ,Fred Luthans , TMH

Paper Title: Object Oriented Programming

Paper Code: IT324
Credits: 04
Max. Marks (Univ. Exam): 50
Max. Marks (Int. Exam): 50
Time: 3 Hours
Total Lectures: 45
L T P 3 1 0

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:** To provide students in-depth theoretical base and fundamentals of Object Oriented Programming paradigm using C++ as well as to prepare students mind setup to learn new computer languages on their own and to prepare them to design and code various projects using C++.

**Part-A**

**Principles of Objected 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.

**Books Recommended**
1. Object Oriented Programming with C++ by Bala Guruswamy, TMH, Edi 2\(^{nd}\).

**Reference Books**

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

**Paper Code:** IT 374  
**MM:** 50  
**Credits:** 2

**Objective:** Understanding of object oriented programming concepts and techniques and fundamentals of programming in C++ by designing and implementing object oriented software to solve moderately complex problems with the ability to write a computer program to solve specified problems.

**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:** IT325  
**Max. Marks (Univ. Exam):** 50  
**Time:** 3 Hours  
**Credits :** 04  
**Max. Marks (Int. Exam):** 50  
**Total Lectures:** 45  
**L T P** 3 1 0

**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: Upon completion of this course on Digital Electronics, the students will be able to design, analyze, evaluate and verify the medium complexity combinational and sequential digital logic circuits using gates and flip flops.

Part-A

Introduction
(10)

Number Systems and Codes
(07)
Decimal, Binary, Hexadecimal, OctalÔ complement, 2Ô 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 8th.

Paper Title: Digital Electronics (Practical)

Paper Code: IT 375 MM: 50 Credits: 2

Note: Do any eight experiments.

Objective: The students will be able to verify the truth table of gates; demonstrate the operation of flip flops ; develop, test and troubleshoot the combinational and sequential circuits.

List of 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.
SYLLABUS FOR B.E.M.B.A (I.T.) FOURTH SEMESTER

Paper Title: IT for Managers

Paper – Compulsory

Paper Code: IBM- 401  Times: 3 Hours
Credits: 03
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 introduce the current concepts of IT and how it is influencing the working of organizations. Students are introduced to application of IT in Business field.

Internal Assessment: 50  External Assessment: 50

Part-A

Information Technology (IT) : IT and society, IT infrastructure in India vis-à-vis developed nations (Telecommunication, Internet reach, PC, Broadband, Mobile Phones), IT applications in Healthcare & Education (8)

System Investigation & Analysis, Networking: System Analysis & Design, Symbols used in modeling a business process, modeling different business processes, Networking concepts: Ethernet, IP addressing, Functioning of Routers, Bridges, hubs and switches in a network, Telecommunication (GSM, CDMA, Wireless and other new technologies) (9)

Internet & Intranet: 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 (8)

Part B

E-Commerce & E-Governance: E-Commerce models, Intermediaries in E-Commerce, study of successful 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: study of portals like EBay, dealing with E-Waste, E-Governance in India, study of implementation of E-Governance in different states in India, scope for further improvement (10)
New Technologies shaping the IT field: Study of new technologies like RFID, WiMAX, Bluetooth, GPS, smart cards etc and their implementation case studies (4)

Online Banking: infrastructure and implementation of Online Banking in India, intermediaries in online banking (4)

Cloud Computing: The business model of cloud computing, advantages and drawbacks of adopting the cloud computing framework. (2)

References:
1. Business Data Communications & Networking, Jerry FitzGerald, Alan Dennis, John Wiley
2. Information Technology for Management: Improving Performance in the Digital Economy, Efraim Turban, Linda Volonino, John Wiley

Paper Title: Data Structures and Algorithms

Paper Code: IT421
Credits: 04
Max. Marks (Univ. Exam): 50
Max. Marks (Int. Exam): 50
Time: 3 Hours
Total Lectures: 45
L T P 3 1 0

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: To provide knowledge regarding efficient storage of data for easy access, how to represent the inherent relationship of the data in the real world, and to teach students various data structures and to explain algorithms for performing various operations on these data structures. The objective of the course is to introduce the fundamentals of Data Structures, abstract concepts and how these concepts are useful in problem solving.

Part-A

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

Arrays, Stacks & Queues:
Concepts; Basic operations & their algorithms: Transverse, Insert, Delete, Sorting of data in these data structures; Prefix, Infix, Postfix Notations; (08)
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: IT471 MM: 50 Credits:2

Objective: To impart knowledge about developing recursive as well as non-recursive algorithms and to gain the knowledge of different data structures. Students must be able to choose the appropriate data structure and algorithm design method for a specified application and to develop skills to design and analyze simple linear and non linear data structures, to strengthen the ability to identify and apply the suitable data structure for the given real world problem and to gain knowledge in practical applications of data structures.
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.
5. **Trees:** Implementation of Binary & Binary Search Trees, Recursive and Non-Recursive traversal of Trees.
6. **Graphs:** BFS & DFS
7. Implementation of sorting and searching algorithms.
8. **Hash Tables Implementation:** Searching, inserting and deleting, searching & sorting techniques.

**Paper Title:** Computer Networks

**Paper Code:** IT422  **Max. Marks (Univ. Exam):** 50  **Time:** 3 Hours  
**Credits:** 04  **Max. Marks (Int. Exam):** 50  **Total Lectures:** 45  
**L T P** 3 1 0

**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:** To provide knowledge about computer network related hardware and software using a layered architecture along with knowledge about various types of networking, networks and network topologies. To impart knowledge to students about basics of Network Management, concepts of OSI reference model and real world protocol suite such as TCP/IP along with outlining the basic network configurations along with security and protection issues.

**Part-A**

**Introduction:**  
(08)  
Basic concepts of computer networks, switching; multiplexing; Network Hardware: LAN, MAN, WAN, Wireless networks, Internet; Network Software: Layer, Protocols, interfaces and services; Reference Model: OSI/TCP/IP and their comparison.

**Physical Layer:**  
(08)  
Transmission media: Magnetic, Twisted pair, coaxial cable, fiber optics, wireless transmission (radio, microwave, infrared, light wave). Circuit Switching & Packet
Switching. Introduction to ATM, ISDN (Narrowband & Broadband), Cellular radio and communication satellites.

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: Computer Networks (Practical)

Paper Code: IT472  
MM: 50  
Credits: 2

Objective: To familiarize students with networking components and devices, transmission media, tools along with study of various LAN topologies, configuration of TCP/IP Protocols in Windows and Linux, designing and implementing networks, subnet planning and its implementation and installation of FTP server and client.

List of Practicals:

1. To familiarize with the various basic tools (crimping, krone etc.) used in establishing a LAN.
2. To familiarize with switch (manageable & unmanageable), hub, connectors, 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: Microprocessor (Theory)

Paper Code: IT423  
Max. Marks (Univ. Exam): 50  
Time: 3 Hours
Credits: 04  
Max. Marks (Int. Exam): 50  
Total Lectures: 45
L T P 3 1 0

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: At the end of this course on Microprocessor and interfacing of 8085 with various peripheral devices, the student will be able to understand the operation of 8085 and the peripheral devices; write programs in machine level language and be able to
develop interfacing techniques.

**Part-A**

**Microprocessor Architecture and Microcomputer Systems:**

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

**Interfacing I/O Devices**

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

**Programming the 8085:**


**Programming Techniques with Additional Instructions:**


**Part-B**

**Counters and Time Delays:**

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

**Stack and Subroutines:**

Stack, Subroutine, Conditional Call and Return Instructions.

**Interrupts:** The 8085 Interrupt, 8085 Vectored interrupts.

**General –Purpose Programmable Peripheral Devices:**

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, PHI, Edi 3rd

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

Paper Title: Microprocessor(Practical)

Paper Code: IT 473          MM: 50          Credits: 2

Objective: The student will be able to develop, key-in, test and troubleshoot the assembly language program on 8085 kits.

List of Experiments:
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: IT424          Max. Marks (Univ. Exam): 50          Time: 3 Hours
Credits : 04          Max. Marks (Int. Exam): 50          Total Lectures: 45
          L T P  3 1 0

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: To describe the progression of computer architecture and understand the computer system organization and structure in general. Students will be able to understand and explain about instruction execution through instruction cycles, basic concept and implementation of interrupts, I/O control and data transfers and representation of numerical data. Students will be able to understand the functioning of arithmetic and logic unit, different instruction formats and control unit. Students will be able to identify the different architectural and organizational design issues such as
instruction set design, pipelining, RISC architecture and superscalar architecture as well as different mechanisms used for read/write operations in the memory design.

Part-A

Design Methodology

System design, Design levels- Gate level, Register level, Processor level.

Basic Computer Organization & Design

Instruction codes, common bus system, computer instruction, Design of basic computer, Design of accumulator logic.

Control Design

Basic concepts, Hardwired control, Micro programmed control, Design of control unit.

Central Processing Unit


Part-B

Input-Output Organization

I/O interface, Modes of transfer, Priority interrupts, DMA, I/O processor.

Memory Organization

Memory hierarchy, Main memory, Auxiliary memory, Associative memory. Cache memory, virtual memory, Memory management H/W.

Parallel Processing

Introduction, Multiprocessors, Interconnection structure.

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

Reference Books
Paper title: Discrete Mathematics

Paper Code: IT435  Max. Marks (Univ. Exam): 50  Time: 3 Hours
Credits : 04  Max. Marks (Int. Exam): 50

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: The main aim of this course is to provide the knowledge of core mathematical foundation of computer science, and to make them familiar with some basic foundation of Artificial Intelligence.

Part-A

Set Theory, Relations & Functions (10)
Sets, Algebra of Sets, Finite Sets, Power Sets, Partitions, Counting Principles, Product sets, Relations, Type Of Relations, Closure Properties, Equivalence Relations, Partial ordering Relations & Lattice, Functions, Type of Functions, Recursive Functions.

Graph Theory & Trees (10)
Introduction, Graphs Multigraph, Isomorphic Graph, Homeomorphic Graphs, Paths & Circuits, Shortest Paths In waited Graphs, Eulerian & Hamiltonian Paths & Circuits, Konigsberg Bridge, Complete, Regular, Bipartite Graphs, Planner Graphs, Graph Coloring, Graph Traversal Techniques. Trees, Binary Search Trees, Complete & Extended Binary Trees.

Part-B

Propositional Logic: (8)
Introduction, propositions, compound propositions, basic logical operations, , propositions and truth tables, tautologies and contradiction, logical equivalence, algebra of propositions, conditional and biconditional statements, arguments, logical implications, functions, quantifiers.

Predicate logic (7)
Representing simple facts, instance, and Isa relationship. Computable functions and predicates resolution: conversion to clause form, unification algorithm, resolution in proposition and predicate logic.

Computational Theory (10)
Finite Automata: NFA, DFA, NFA to DFA, state minimization, Moore and Mealy Machines, Regular expressions, grammars, Pushdown automata, Turing Machines.

Recommended Books:

<table>
<thead>
<tr>
<th>NAME</th>
<th>AUTHOR(S)</th>
<th>PUBLISHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to automata theory, Languages and</td>
<td>Hopcroft. J.E., Ullman J.D.,</td>
<td>Narosa Publishing House</td>
</tr>
</tbody>
</table>
SYLLABUS FOR B.E.M.B.A (I.T.) FIFTH SEMESTER

Paper title: Data Base Management Systems

Paper Code: IT521
Credits : 03
Max. Marks (Univ. Exam): 50
Max. Marks (Int. Exam): 50
Time: 3 Hours
Total Lectures: 45
L T P 3 0 0

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: To expose the student to the basic concepts involved in designing and building a database management system and to make them learn how to use the Structured Query Language (SQL), understand the relational model and relational database management system, detailed knowledge of transaction, concurrency and recovery strategies of DBMS and knowing the importance of normalization for DBMS and different normalization techniques.

Part-A

Data Base Concept: (04)
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: (05)
Introduction to Data Models, Entity Relationship Model, Entities, Attributes, E-R Diagrams, Conceptual Design of a relational data base model.

Data Normalization: (06)
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.

PL/SQL:


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 571**  
**MM: 50**  
**Credits: 2**

**Objective:** Programming assignments will require students to use the Oracle database system with hands on experience on DDL, DML as well as DCL commands and make students able to implement nested queries and various functions based on programming assignments.

**Practical based on Theory**

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**Paper Title: Computer Graphics**

**Paper Code: IT522**  
**Max. Marks (Univ. Exam): 50**  
**Time: 3 Hours**  
**Total Lectures: 45**

Max. Marks (Int. Exam): 50  
L T P 3 1 0

**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:** To study the introduction of computer graphics and its algorithms, segments, geometric transformations, windowing and clipping, 3D geometry and transformations, hidden Line methods

**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:

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:

Back face removal algorithms, hidden line methods

Text Book:

Reference Books:

Paper Title: Computer Graphics (Practical)

Paper code: IT 572 MM: 50 Credits: 2

Objective: Understanding how the various elements that underlie computer graphics (algebra, geometry, algorithms and data structures, optics, and photometry) interact in the design of graphics software systems.

Practical based on theory.
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: To study and understand main components of operating system, their working, and operations performed by operating system. This subject provides students knowledge on: resource management provided by operating systems, concepts and theories of operating systems, implementation issues of operating systems. Students will be able to understand description of multiprocessor and distributed operating system and different operating system and compare their features.

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)
Naming and Transparency, Remote file Access, Stateful versus stateless service, File replication, Event ordering, Mutual Exclusion, Atomicity, Concurrency control,
Deadlock Handling, Election Algorithms, Reaching Agreement.

**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 573  MM: 50  Credits: 2

Objective: The objective of this lab is to teach students about various operating systems including and UNIX. Students learn about systems configuration and administration. Students learn, explore and practice technologies related to UNIX.

List of Practicals:

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-else-if-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.

Paper title: MARKETING MANAGEMENT

Course : BE-MBA  Vth Semester

Paper – Compulsory

Paper Code:  IBM-  501  Time: 3 Hours
Credits: 03

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: This course introduces the students to marketing functional area and builds a foundation for further study. The core concepts of the subject are discussed.

Internal Assessment: 50  External Assessment: 50
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 (4)

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. (8)

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. (6)

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. (6)

Part B

Product Decisions: Product characteristics; classifications; differentiation; packaging and labeling; Product Life Cycle. (4)

Pricing Strategies: Understanding Pricing; Setting the Price; Initiating and Responding to Price Changes; Reactions to Competitor’s Price Changes. (5)

Marketing Channels: Marketing Channels; Role of Marketing Channels; Identifying Major Channel Alternatives; Types of Intermediaries; Channel-Management Decisions, Retailing, Wholesaling. (6)

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. (6)

References:
1. Principles of Marketing, Philip Kotler, Pearson
2. Marketing Management, R. Saxena, TMH
HUMAN RESOURCE MANAGEMENT

Course: BE-MBA Vth Semester

Paper – Compulsory

Paper Code: IBM-502
Credits: 03

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: Human Resource Management (HRM), an important functional area in organizations is discussed and students are introduced to different aspects of HRM.

Internal Assessment: 50
External Assessment: 50

Part-A

Human Resource Philosophy: Changing environments of HRM, Using HRM to attain competitive advantage, Trends in HRM, Organization of HR departments, Line and staff functions, Role of HR Managers

Job analysis: Methods - IT and computerized skill inventory - Writing job specification - HR and the responsive organization.

Recruitment and selection process: Employment planning and forecasting, Building employee commitment, Promotion from within, Sources, Developing and Using application forms, IT and recruiting on the internet.

Employee Testing & selection: Selection process, basic testing concepts, types of test, work samples & simulation, selection techniques, interview, common interviewing mistakes, Designing & conducting the effective interview, small business applications, computer aided interview.

Part-B

Training & Development: Orientation & Training: Orienting the employees, the training process, need analysis, Training techniques, special purpose training, Training via the internet, Performance appraisal: Methods - Problem and solutions - MBO approach, The appraisal interviews - Performance appraisal in practice.

Managing careers: Career planning and development - Managing promotions and transfers.


References:

Paper Title: Multimedia Systems

Paper Code: IT525
Credits: 03
Max. Marks (Univ. Exam): 50
Max. Marks (Int. Exam): 50
Time: 3 Hours
Total Lectures: 45
L T P 3 0 0

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: To understand the basics of multimedia technologies and introduction to various image formats and their features, fundamentals of digital image and video compression techniques and make student understand the basics of Virtual Reality and its importance along with familiarization with various multimedia applications in various environments.

Part-A

Introduction:

Multimedia Technology:
Multimedia Systems Technology, Multimedia Hardware devices, Multimedia software development tools, Multimedia Authoring Tools, Multimedia Standards for Document
Architecture, SGML, ODA, Multimedia Standards for Document interchange, MHEG, Multimedia Software for different media.

Storage Media:

Magnetic and Optical Media, RAID and its levels, Compact Disc and its standards, DVD and its standards, Multimedia Servers.

Audio:

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:


Video and Audio Compression:


Multimedia Communication:

Building Communication network, Application Subsystem, Transport Subsystem, QOS, Resource Management, Distributed Multimedia Systems

Books Recommended:

Reference Books:

1. Multimedia System Design By Prabhat K. Andleigh, Kran Thakkar, PHI, 3\textsuperscript{rd} Edition
2. Multimedia Computing By Li, Drew, Pearson Education, 2\textsuperscript{nd} Edition
3. Multimedia Communications By Fred Halsall, Pearson Education, 4\textsuperscript{th} Edition
SYLLABUS FOR B.E. M.B.A (I.T.) SIXTH SEMESTER

Paper Title: Wireless Communication

Paper Code: IT621  Max. Marks (Univ. Exam): 50  Time: 3 Hours
Credits : 04  Max. Marks (Int. Exam): 50  Total Lectures: 45

L T P 3 1 0

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: To provide basic knowledge about problems and design approaches in wireless communication systems. This includes engineering models in radio propagation and the application of antennas to wireless communication. Students will familiarize with channel impairment, mitigation techniques, and multiple access techniques. Migration to 3G technologies is also covered in the course.

Part-A

Introduction
(09)
Evolution of Mobile Communication Systems, Paging systems, cordless telephone systems, cellular telephone systems, comparison of common wireless communication systems.

System Design Fundamentals
(13)
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
(08)
GSM, GSM reference architecture and GSM security architecture, CDMA digital cellular standard, IS-95 system.

Part-B

Channel Impairment Mitigation Techniques
(05)
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 671**  
MM: 50  
Credits: 2

**Objective:** To familiarize students with the TCP/IP Suite, understand the Wireless Communication Technology (Satellite, Cellular and Bluetooth networking).

**Practical based on theory.**

**Paper title: Software Engineering**

**Paper Code: IT622**  
Credits : 04

**Max. Marks (Univ. Exam):** 50  
**Time: 3 Hours**

**Max. Marks (Int. Exam):** 50  
**Total Lectures: 45**

**L T P 3 1 0**

**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:** To help students to develop skills that will enable them to construct software of high quality software that is reliable and that is reasonably easy to understand, modify and maintain.

**Part-A**

**Software Evolution**

Project Management Concepts


S/W Project Planning

Project estimation, Empirical Estimation Models, COCOMO Model. (04)

Risk Management

Reactive Vs Proactive risk strategies, s/w Risks, Risk Identification, Projection, Risk Mitigation, Monitoring and Management. (04)

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. (06)

Part-B

S/W Configuration Management

Baselines, S/w configuration Items, SCM process, Version control, Change control. (05)

Design

Design Concepts and principles, Modular Design, Design Methods. (06)

S/W Testing Methods

Testing Fundamentals, test case design, White box testing, Black Box testing, Testing Strategies, Verification & validation, Unit, Integration, Validation, System Testing. (06)

Computer aided S/W Engineering

CASE, Building blocks For Case, Integrated Case Environment. (04)

Books Recommended


Reference Books

Paper title: Internet & Web Technology

Paper Code: IT633 Max. Marks (Univ. Exam): 50 Time: 3 Hours
Credits: 03 Max. Marks (Int. Exam): 50 Total Lectures: 45
L T P 3 0 0

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: To enable the students to get familiar with current technologies used in web development and maintenance and to highlight the features of different technologies involved in web technology and various scripting languages.

Part-A

Introduction (05)
Objected oriented concepts, object oriented programming (review only), advanced concept in OOP relationship, inheritance, abstract classes, polymorphism, Object Oriented design methodology approach, best practices, UML class diagrams, interface, common base class.

Networking & Security (09)
Internetworking, working with TCP/IP, IP address, subnetting, DNS, VPN, proxy servers, firewalls, Client/Server concepts, World Wide Web, components of web application, MIME types, browsers and web servers, types of web content, URL, HTML, HTTP protocol, Web applications, performance, application servers, Web security, User Experience Design, basic UX terminology, UXD in SDLC, rapid prototyping in Requirements.

HTML & Scripting (06)
Client Tier using HTML, basic HTML tags, look and feel using CSS, client side scripting using Java Script and validations, Document Object Model (DOM)

Frameworks & Multithreading Programming (10)
Business tier using POJO (Plain Old Java Objects), introduction to frameworks, introduction to POJO, multithreaded programming, Java I/O, Java Database Connectivity (JDBC).

JSP & programming (10)
Presentation tier using JSP, role of Java EE in enterprise applications, basics of servlets, introducing server side programming with JSP, standard tag library.

Recommended Books:

<table>
<thead>
<tr>
<th>NAME</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Multimedia Computing Communications and Applications</td>
<td>Ralf, by Steinmetz and Klara Nahrstedt</td>
<td>Pearson Education</td>
</tr>
</tbody>
</table>
Paper title: Internet & Web Technology (Practical)

Paper Code: IT 683

MM: 50

Credits: 2

Objective: The objective is to expose students to project development best practices and apply the concepts assimilated during the classroom session.

SYLLABUS

Practical Exposure:
The assignments for OOC, HTML, JDBCand JSP are to be completed as part of the Hands-On for the subjects.

- OOC using Java
- HTML/JS
- JDBC
- JSP

Project based on developing & deploying web application(s). The Project Development is primarily based on the Client tier using HTML/JS, JDBC and Presentation tier using JSP with back end database such as MS-Access or Oracle 9i.
The project is a Group Activity-consisting of 4 members in a team. The project specification hosted on the portal has to be completed. The project has to be evaluated before the final examination.
Paper Title: Business Intelligence

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: To impart knowledge of data warehousing and data mining for Business Processes and to understand the role of Business Intelligence in taking business decisions.

Part A

Introduction to Business Intelligence: (8)
Introduction to OLTP and OLAP, BI Definitions & Concepts, Business Applications of BI, BI Framework, Role of Data Warehousing in BI, BI Infrastructure Components ï BI Process, BI Technology, BI Roles & Responsibilities

Basics of Data Integration (Extraction Transformation Loading) (8)
Concepts of data integration, need and advantages of using data integration, introduction to common data integration approaches, introduction to ETL, Introduction to data quality, data profiling concepts and applications.

Introduction to Multi-Dimensional Data Modeling, (8)
Introduction to data and dimension modeling, multidimensional data model, ER Modeling vs. multi dimensional modeling, concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema

Part B

Basics of Enterprise Reporting (6)
Introduction to enterprise reporting, concepts of dashboards, balanced scorecards, and overall architecture.

Data Mining Functionalities: 15
Association rules mining, Mining Association rules from single level, multilevel transaction databases, Classification and prediction, Decision tree induction, Bayesian classification, k-nearest neighbor classification

Text Books:
References:
2. Larissa Terpeluk Moss, Shaku Atre : Business Intelligence roadmap by Addison Wesley
3. Cindi Howson : Successful Business Intelligence: Secrets to making Killer BI Applications by Tata McGraw Hill
4. Mike Biere : Business intelligence for the enterprise by : Addison Weseley, August 2010

Paper title: Business Intelligence and Software Engineering (Practical)

Paper Code: IT 675 MM: 50 Credits: 2

Objective: Students will understand the concepts and be able to apply these concepts in various business contexts and through hands-on exercises with leading software applications for OLAP, OLTP, data warehouses, data marts and relational database and models.

Practical based on theory.

Paper Title: MANAGERIAL ECONOMICS

Course: BE-MBA VI th Semester

Paper – Compulsory

Paper Code: IBM- 601 Time: 3 Hours Credits: 03

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: This course serves as an introductory course to Managerial Economics. Students are introduced to Microeconomics and Macroeconomics and its importance.

Internal Assessment: 50 External Assessment: 50
Part-A

Introduction to Managerial Economics and Demand Concepts: Nature Scope and Importance of Managerial Economics, opportunity costs, incremental principle, time perspective, Equi marginal principles, Individual Demand, Market Demand, Kinds of Demand, Determinants of Demand, Demand Functions and Law of Demand, Income and Price elasticity of demand, substitution effect (12)


Production Function: Concept and types, Returns to Factor and Returns to Scale, Law of Variable Proportions, law of diminishing marginal returns (4)

Cost concepts and Analysis: Concept of Cost, Short run and Lung-run Cost Curves, Relationships among various costs (3)

Revenue Curves: Concept and Types (2)

Part B

Perfect Competition: Characteristics, Equilibrium Price, Profit Maximizing output in Short Run and Long Run, Price Discrimination; Imperfect Competition, Monopolistic Competition, Oligopoly and Barriers to Entry (8)

Economic Environment of Business- Meaning of GDP, Monetary and Fiscal Policy, Deficit Financing, Inflation, Subsidies, Devaluation of Rupee, Liberalization, Privatization and Disinvestment (8)

References:

1. Managerial Economics, Mote, Paul Gupta, Vikas Publisher, New Delhi
3. Microeconomics, Robert. Pindyck, Daniel Rubinfeld, Pearson
Paper Title: CORPORATE LEGAL ENVIRONMENT

Course: BE-MBA VI th Semester

Paper – Compulsory

*Paper Code: IBM- 602*  
*Credits: 03*  

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 Corporate Legal environment has a profound impact on the working of organizations. This course introduces the students to various laws related to business.

Internal Assessment: 50  
External Assessment: 50

**Part A**

**The Contract Act 1872** : Introduction: Meaning of contract; Types of contract; Essential elements of a valid contract. Offer: Meaning and Definition of offer; Types; Rules regarding offer; Revocation of offer; Lapse of offer. Acceptance: Meaning and Definition of acceptance; Rules regarding acceptance; Revocation of acceptance. Consideration: Definition; Types; Rules; Exceptions Capacity of Parties: Position of Minor, Person of unsound mind, Persons disqualified by law. Free consent; Discharge of contract, Remedies for Breach of contract, Contract of Indemnity, Contract of Guarantee  

(10)

**Sales of Goods Act 1930** : Meaning; Difference between Sale of Goods and Agreement to Sale, Essentials of Contract of Sale; Difference between Contract of Sale and Hire-Purchase Agreements; Conditions and Warranties; Transfer of property or ownership; Performance of Contract of Sale; Rights of Unpaid Seller; Auction Sale.  

(8)

**The Companies Act, 1956** : Definition; Meaning; Features; Types of companies; Incorporation of a company; Memorandum of Association; Articles of Association and Prospectus; Doctrine of Indoor Management; Lifting of Corporate Veil; Registration and Incorporation of a company; Doctrine of Ultravires Transactions; Winding up of company.  

(10)
Part B


Information Technology Act-2000: 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

References:

2. An Introduction to Mercantile Laws- N.D. Kapoor, Sultan Chand & Sons
SYLLABUS FOR B.E. M.B.A (IT) Seventh Semester

Paper Title: Digital Signal Processing

Paper Code: IT721  Max. Marks (Univ. Exam): 50  Time: 3 Hours
Credits:4  Max. Marks (Int. Exam): 50  Total Lectures: 45
L  T  P  3 1 0

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: To understand how to analyze and manipulate digital signals and have the fundamental MATLAB programming knowledge to do so. The intention is to also provide the student with the necessary background for taking advanced level courses in signal and image processing, and ideally, for reading technical literature in DSP.

Part - A

Introduction to Digital Signal Processing (04)
Applications and advantages of DSP. Sampling theorem, concept of frequency in discrete time signals.

Discrete Time Signals and Systems (08)
Classification of signals, standard signals and classification of discrete time systems. Linear Time Invariant systems and their representation by difference equations and structures.

Z- Transform (04)
Definition of direct, inverse z-transform and its properties. System function of a LTI system. Inverse z-transform by power series expansion and partial fraction expansion.

Frequency Analysis (08)
Fourier series and transform of discrete time signals and properties (DTFT). Discrete Fourier Transform and its properties. Fast Fourier Transform algorithms, decimation in time and decimation in frequency algorithms (radix 2).

Part – B

Realization of FIR & IIR Systems: (04)
Direct forms, cascade and parallel form IIR structures. Direct form, cascade and linear phase FIR structures.

Design of Digital Filters: (12)
Comparison of Analog and Digital filters, Comparison of IIR and FIR filters. FIR Filters and linear phase requirement. FIR filters design using the window technique. IIR Filters and their design using the impulse invariance technique and bilinear transformation. Finite word length effects.
DSP Processors
Introduction to DSP Processors, architecture of TMS 320CXX and ADSP 21XX

Books Recommended:


Paper Title: Digital Signal Processing (Practical)

Paper code: IT771 Max. Marks 50 Credits: 2

Objective: To develop skills for analyzing and synthesizing algorithms and systems that process discrete time signals, with emphasis on realization and implementation. Computer simulation exercises are intended to familiarize the student with implementation aspects and the application of theoretical knowledge to practical problems.

Practical based on theory.

Paper Title: Java Technologies

Paper Code: IT732 Max. Marks (Univ. Exam): 50 Time: 3 Hours
Credits:3 Max. Marks (Int. Exam): 50 Total Lectures: 45

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: This subject will provide students with the principles of object orientation from the perspective of Java implementation and UML. Students are expected to learn the concepts of and practical approaches to object-oriented analysis, design and programming using UML and Java.

Part – A

Java Methods, Classes and Inheritance: (8)
Introduction; classes; methods; constructors; overloading methods; arrays; recursion; passing arrays and objects to methods; Inheritance; method overriding; abstract classes; using final; packages; interfaces.

I/O, Applets and Graphics: (8)
I/O basics; stream classes; byte and character streams; reading and writing files; Applet fundamentals; Applet class; Applet initialization and termination; event handling; keyboard
and mouse events; AWT class; Layout managers; panels; canvases; Frame windows; drawing lines, rectangles, ellipses.

**Exceptional Handling and Multithreaded Programming:**
Exception handling fundamentals; exception types; uncaught exceptions; try and catch; creating exception classes; throwing exceptions; Java thread model; thread priorities; creating a thread; interthread communication; thread synchronization; suspending, resuming and stopping threads;

**Part – B**

**Overview of J2EE and working with JDBC:**
What is J2EE, component based architecture of J2EE: Web, Business and Application component, commonly used classes and interfaces of java.sql package, connecting java application to a database, prepared statements.

**Servlets and JSP:**
Java Servlets, compilation, deployment, and testing a servlet, session management, request dispatching, Java Server Pages, deploying and testing a JSP, using java beans in JSP.

**Enterprise Java Beans(EJB):**
Architecture of EJB, creating a stateless-session EJB, statefull-session bean, Life Cycle of session beans, Entity beans, life cycle of entity beans.

**Recommended Books:**

<table>
<thead>
<tr>
<th>NAME</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Java: How to Program, 6th Edition</td>
<td>Deitel and Deitel</td>
<td>Pearson Education</td>
</tr>
<tr>
<td>The Complete Reference Java2</td>
<td>Herbert Schildt</td>
<td>TMH</td>
</tr>
</tbody>
</table>

**Paper title: Java Technologies (Practical)**

**Paper Code: IT 782**

**Objective:** Students are expected to learn the concepts of and practical approaches to object-oriented analysis, design and programming using UML and Java.

**SYLLABUS**

**Practical based on theory.**
Paper Title: Cloud Computing

Paper Code: IT734
Credits:3
Max. Marks (Univ. Exam): 50
Time: 3 Hours
Max. Marks (Int. Exam): 50
Total Lectures: 45
L T P 3 0 0

SECTION – A

Cloud Computing Basics
Introduction- Shift from distributed computing to cloud computing; Cloud Computing Overview; Characteristics; Applications; Internet and Cloud; Benefits; Limitations; Challenges; Cloud Computing Services and Deployment Models

Cloud Computing Services and Deployment Models
Infrastructure as a Service; Platform as a Service; Software as a Service; Private Cloud; Public Cloud; Community Cloud; Hybrid Cloud.

Cloud Computing vs Other Computing Technologies

Understanding Abstraction and Virtualization
Virtualization Technologies, Load Balancing and Virtualization, Hypervisors, Machine Imaging.

SECTION – B

Cloud Storage and Cloud Standards
Overview; Storage as a Service; Cloud Storage Issues; Challenges; Standards.

Using Cloud Services
Cloud collaborative applications and services Ï case studies with calendars, schedulers and event management; cloud applications in project management.

Cloud Security
Securing the Cloud, Securing Data, Establishing identity and presence.

Case studies
Microsoft Azure, Google App Engine and Open source clouds-Open-Nebula and Eucalyptus

Recommended Books:

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ELECTIVE-I

Paper Title: Artificial Intelligence

Paper Code: IT704

Max. Marks (Univ. Exam): 100
Max. Marks (Int. Exam): 50
Time: 3 Hours
Total Lectures: 45
L T P 3 1 0

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: This subject aims to introduce the main concepts, ideas and techniques of artificial intelligence (AI) to the students so that they could know the various aspects of AI, understand some essential principles and are able to implement some basic AI techniques in their projects or other related work.

Part – A

Introduction: (06)
Artificial Intelligence and its applications, Artificial Intelligence Techniques, criteria of success, Intelligent Agents, Nature and structure of Agents, Learning Agents

Problem solving techniques: (09)
State space search, control strategies, heuristic search, problem characteristics, production system characteristics, Generate and test, Hill climbing, best first search, A* search, Constraint satisfaction problem, Mean-end analysis, Min-Max Search, Alpha-Beta Pruning, Additional refinements, Iterative Deepening

Knowledge representation: (08)
Mapping between facts and representations, Approaches to knowledge representation, procedural vs declarative knowledge, Forward vs. Backward reasoning, Matching, conflict resolution, Non-monotonic reasoning, Default reasoning, statistical reasoning, fuzzy logic Weak and Strong filler structures, semantic nets, frame, conceptual dependency, scripts.

Part – B

Planning: (06)
The Planning problem, planning with state space search, partial order planning, planning graphs, planning with propositional logic, Analysis of planning approaches, Hierarchical planning, conditional planning, Continuous and Multi Agent planning
Learning:
(10)
Forms of Learning, inductive learning, Decision trees, Computational learning theory, Logical
formulation, knowledge in learning, Explanation based and relevance based learning, statistical
learning, Learning with complete data and hidden variables, instance based learning, Neural Networks

Introduction to Natural Language processing and Expert system:
(06)
Basic Tasks of Natural Language processing, Expert systems, Expert system examples,
Expert System Architectures, Rule base Expert systems, Non Monotonic Expert Systems,

Books Recommended:

References:

Paper Title: MOBILE COMPUTING

PaperCode: IT704
Credits: 04
Max. Marks (Univ. Exam): 100
Max. Marks (Int. Exam): 50
Time: 3 Hours
Total Lectures: 45
L T P 3 1 0

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: To provide basics for various techniques in Mobile Communications and
Mobile Content services. The students will understand the fundamentals of mobile
computing with ubiquity of wireless communication technologies and the proliferation of
portable computing devices and to build skills in working with Wireless application
Protocols to develop mobile content applications.

SECTION – A
Mobility:
(6)
Issues, challenges, and benefits; Review of mobile and cellular communication
technology; Review of distributed/network operating systems, ubiquitous computing.

Global System for Mobile Communication (GSM) System Overview:
(5)
GSM Architecture, Mobility Management, Network Signaling, GPRS
Mobile IP Networks: (5)
Physical mobility, challenges, limits and connectivity, mobile IP and cellular IP in mobile computing.

Mobile Transport Layer: (5)
Transport layer issues in wireless, Indirect TCP, Snoop TCP, Mobile TCP

SECTION – B

Wireless LANs: (6)
Introduction to IEEE 802.11, Bluetooth technologies and standards.

Mobile Adhoc Networks: (6)
Hidden and exposed terminal problems; Routing protocols: DSDV, DSR, AODV.

Mobile Devices and OS: (6)

Application Development: (6)
WWW programming model, Development Environment for Mobile Devices.

Text Books:

References:
2. D. Milojicic, F. Douglish. : Mobility Processes, Computers and Agents, Addison Wesley
3. Raj Kamal : Mobile Comcomputing, Oxford University Press

Paper Title: Building Enterprise Applications

Paper Code: IT724
Max. Marks (Final Exam): 50
Credits : 4
Time: 3 Hours
Max. Marks (Sessional Exam): 50
Total Lectures: 45
L T P: 3 1 0

Note: Examiner shall set eight questions covering four questions from each section. Candidate will be required to attempt five questions, at least two from each section.

Objectives: To expose the students to the essentials of building enterprise applications. The core modules of this elective include designing and developing high quality enterprise applications and other tasks related to it.
SECTION – A

Introduction to Enterprise application
Introduction to enterprise applications and their types, software engineering methodologies, life cycle of raising an enterprise application, introduction to skills required to build an enterprise application, key determinants of successful enterprise applications, and measuring the success of enterprise applications

Incepting enterprise application and business process modeling
Inception of enterprise applications, enterprise analysis, business modeling, requirements elicitation, use case modeling, prototyping, non functional requirements, requirements validation, planning and estimation

Enterprise Architecture and designing enterprise application
Concept of architecture, views and viewpoints, enterprise architecture, logical architecture, technical architecture - design, different technical layers, best practices, data architecture and design relational, XML, and other structured data representations, Infrastructure architecture and design elements - Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of application architecture and design

SECTION – B

Constructing enterprise application
Construction readiness of enterprise applications - defining a construction plan, defining a package structure, setting up a configuration management plan, setting up a development environment, introduction to the concept of Software Construction Maps, construction of technical solutions layers, methodologies of code review, static code analysis, build and testing, dynamic code analysis code profiling and code coverage.

Testing and rolling out enterprise application
Types and methods of testing an enterprise application, testing levels and approaches, testing environments, integration testing, performance testing, penetration testing, usability testing, globalization testing and interface testing, user acceptance testing, rolling out an enterprise application

Text Books:

References:
3. Dean Leffingwell, Don Widrig : Managing Software Requirements: A
Paper Title: ACCOUNTING FOR MANAGERS

Course: BE-MBA VIIth Semester

Paper – Compulsory

Paper Code: IBM- 701  
Credits: 03  
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: This course introduces the students to basics of Accounting functional area and builds the foundation for Financial Management.

Internal Assessment: 50  
External Assessment: 100

Part-A

Accounting and its functions; Basic Accounting Concepts and Accounting Conventions; Accounting Principles; Generally Accepted Accounting Policies (GAAP); Accounting Standards; Branches of Accounting: Financial Accounting; Cost Accounting; Management Accounting; Accounting Equation; Accounting Structure; Types of Accounts. (4)

Rules regarding Journal Entries; Recording of Journal Entries; Ledger Posting; Trial Balance; Preparation of Final Accounts; Trading Account; Profit & Loss Account; Balance Sheet; Treatment of Adjustments into trial balance. (7)

Meaning of Management Accounting; Nature; Scope; Objectives; Functions of Management Accounting; Relationship between Financial and Management Accounting; Tools and Techniques of Management Accounting; Limitations; Meaning of Financial Statement; Importance and Limitations of Financial Statement; Meaning and Objectives of Financial Statement Analysis; Limitation of Financial Analysis. (10)

Ratio Analysis: Meaning of Ratio; Interpretation of Ratios; Significance of Ratio Analysis; Limitations of Ratio Analysis; Classification of Ratio; Analysis of Short-term financial position; Analysis of Long term financial position; Analysis of profitability. (7)
Part-B

Fund Flow Analysis: Meaning and Concept of Funds; Meaning of Fund Flow; Meaning of Fund Flow Statement; Significance; Limitations; Procedure of Preparing Fund Flow Statement; Schedule Showing Change in working capital; Adjusted Profit & Loss Account; Statement of Sources and Applications of Funds. Treatment of Adjustment; Statement of Sources and Applications of Funds. Treatment of Adjustment; (9)

Cash Flow Analysis: Meaning; Classification of Cash Flow; Comparison between Fund Flow Statement and Cash Flow Statement; Difference between Cash Flow Statement and Cash Budget Limitations; Preparation of Cash Flow Statement (as per AS-3); Treatment of Adjustments. (8)

References:
1. Managerial Accounting, Hilton, Ramesh, Jaidev, TMH

Paper Title: STATISTICS & RESEARCH METHODOLOGY
Course: BE-MBA VII th Semester

Paper – Compulsory

Paper Code: IBM- 702
Credits: 03
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 course introduces the students to statistical techniques and methods of research

Internal Assessment: 50
External Assessment: 100

Part A

Introduction to Descriptive Statistics: Types of Data, Measures of Central Tendency; Measures of Dispersion- Range, Quartile Deviation, Mean Deviation, and Standard Deviation, Skewness & Kurtosis. (4)

Probability: Basic probability concepts, Joint probability, Conditional probability, Bayes Theorem, Random Variables and Discrete Probability distributions: Poisson, Binomial and Normal, Normally distributed variables, areas under the standard normal curve. (10)
**Research Design:** Meaning, Characteristics and various concepts relating to research design and classification of research design, Importance. (4)

**Measurement and Scaling:** Data Types Nominal, Ordinal and Ratio scale; scaling techniques. (3)
Part B

**Formulation of Hypothesis:** Confidence Intervals, Meaning, Characteristics and concepts relating to testing of Hypothesis (Parameter and statistic, Standard error, Level of significance, type-I and Type-II errors, Critical region, one tail and two tail tests); Procedure of testing Hypothesis. Numerical problems based on chi-square test, Hypothesis tests for one population mean: Z test, t-test, Wilcoxon Signed-Rank test, Inferences for two population means, Mann-Whitney Test, F-test (15)

**Data Analysis & Interpretation:** Introduction to Multivariate analysis- Multiple and partial correlation, Analysis of Variance (ANOVA)-One way and Two way ANOVA. Introduction to discriminant analysis and Factor Analysis (9)

**References:**

1. Business Research Methods, William G. Zikmund, Cengage Learning India
2. Business Research Methods, Cooper, D.R. & Schindler, TataMcGraw-Hill
SYLLABUS FOR B.E.M.B.A (IT) Eighth Semester

Paper Title: DIGITAL IMAGE PROCESSING

Paper Code: IT821  
Max. Marks (Univ. Exam): 50  
Time: 3 Hours  
Max. Marks (Int. Exam): 50  
Total Lectures: 45

Credits: 4  
L T P  3 1 0

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: To teach students the fundamentals of digital image processing on the computer and to introduce students to basic principles of digital images, image data structures and image processing algorithms.

SECTION – A

Introduction to Image Processing:  
Digital Image representation, Sampling & Quantization, Steps in image Processing, Image acquisition, color image representation, color models  
(4)

Image Transformation & spatial Filtering:  
Intensity transform functions, histogram processing, Spatial filtering, fourier transforms and its properties, Walsh transform, Hotelling transforms, Haar and slant transforms, Hadamard transforms, frequency domain filters, Homomorphic Filtering, Pseudo coloring, color transforms  
(6)

Image Restoration:  
Image degradation and restoration process, Noise Models, Noise Filters, degradation function, Inverse Filtering  
(4)

SECTION – B

Image Compression:  
Coding redundancy, Interpixel redundancy, Psychovisual redundancy, Huffman Coding, Arithmetic coding, Lossy compression techniques, JPEG Compression  
(6)

Image Segmentation & Representation:  
Point, Line and Edge Detection, Thresholding, Edge and Boundary linking, Hough transforms, Region Based Segmentation, Boundary representation, Boundary Descriptors, Regional Descriptors  
12

Object Recognition:  
Patterns and Patterns classes, Recognition based on Decision Theoretic methods  
(6)
Text Books:


References:


Paper Title: DIGITAL IMAGE PROCESSING (Practical)

Paper Code: IT 871 Max. Marks: 50 Credits:2

Note: Students are required to complete any 8 practicals by implementing them in any of the programming language such as Java, C/C++, C#, MATLAB.

Objective: To develop an overview of the field of image processing, understand the fundamental algorithms and how to implement them, prepare to read the current image processing research literature, gain experience in applying image processing algorithms to real problems.

List of Practicals:

1. Reading and displaying images in different formats using different color models.
2. Converting color images into monochrome images.
3. Understanding brightness, contrast and intensity concept of images
4. Images enhancements using grey level transformations
5. Image enhancements using spatial filters
6. Image enhancements in frequency domain
7. Homomorphic Filtering
8. Image Noise removal and inverse filtering of images
9. Image color enhancements using pseudo coloring techniques
10. Point, Line, Edge and Boundary Detections in images
11. Histogram Matching and specification on images
12. Boundary Linking techniques on images
13. Thresholding of Images
14. Magnification of Images
15. Image representation and Description techniques

Paper title: EMBEDDED SYSTEM DESIGN

Paper Code: IT822       Max. Marks (Univ. Exam): 50    Time: 3 Hours
Credits: 4               Max. Marks (Int. Exam): 50    Total Lectures: 45
                                    L T P 3 1 0

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: To introduce students to the embedded systems, its hardware (micro-controllers) and software, devices and buses used for embedded networking and explain real time operating systems, inter-task communication and an exemplary case of RTOS.

Part - A

Introduction to Microcontrollers (08)
Comparison of Microprocessors and Microcontrollers. Embedded and external memory devices, CISC and RISC processors, Harvard and Von Neumann Architectures.

Overview of 8 bit Microcontrollers (12)
Overview of 8051, Architecture, addressing modes and instructions. Interrupts, Timer/Counters, Serial Communication and applications. Interfacing Overview of Atmel 89C51 microcontroller.

Part - B

PIC Microcontrollers (17)
Introduction and features, PIC 16C6X/7X: Architecture, Registers, Reset actions, Memory Organization, Instructions, Addressing Modes, I/O Ports, Interrupts, Timers, ADC. Input Capture, Output Compare, Frequency Measurement, Serial I/O Device
Software Development & Tools (04)


Real Time Operating Systems (04)

RTOS Architecture, Task and Task States, Tasks and Data, Semaphores and shared data, Operating System Services: message queues, timer function, events, memory management, interrupt Routines in an RTOS environment, Basic Design Using RTOS

Books Recommended:

3. Microcontrollers ( Theory and Applications ) by Ajay Deshmukh, TMH Publishers

Paper title: EMBEDDED SYSTEM DESIGN & TECHNIQUES

Paper Code: IT 872 Max. Marks: 50 Credits: 2

Objective: Practical introduction to the design, implementation, testing and documentation of microprocessor-based systems.

Practical based on theory.

ELECTIVE II

Paper Title: SOFTWARE TESTING AND QUALITY ASSURANCE

Paper Code: IT823 Max. Marks (Univ. Exam): 50 Time: 3 Hours
Credits: 4 Max. Marks (Int. Exam): 50 Total Lectures: 45
           L T P  3 1 0

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: To make students aware about the importance of the software testing during software development. The course covered to be in line with the development tools and languages taught in this level. The course will prepare the student for software testing and debugging. It will further laid the foundation for advanced courses in Software quality assurances.

Part– A

Introduction: (07)

Software Quality Assurance Concepts and Standards: (08)

Risk Management and Change Management: (07)

Part– B

Software Testing: (07)

Testing Techniques: (08)

Testing Process: (08)
Books Recommended:

References:

Paper Title: SYSTEM SIMULATION AND MODELING

Paper Code: IT823         Max. Marks (Univ. Exam): 50          Time: 3 Hours
Credits: 4                Max. Marks (Int. Exam): 50

Objective: The main objective of this subject is to gain knowledge about system and its behavior so that students can transform the physical behavior of a system into a mathematical model that can in turn transform into an efficient algorithm for simulation purpose.

PART A

Introduction: What is modeling and simulation, application areas, definition and types of system, model and simulation, introduction to discrete-event and continuous simulation. (5)

Simulation Methods: Discrete-event Simulation, Time advance Mechanisms, Components and organization of Discrete-event simulation, Flowchart of next-event time advance approach, Continuous Simulation. (10)

Queueing Models: Single server queuing system, introduction to arrival and departure time, flowcharts for arrival and departure routine. Event graphs of queuing model. Determining the events and variables, Event graphs for inventory model. (10)

PART – B

Random Numbers: Introduction to Random Numbers, Importance of Random Numbers in Simulation, Mid-Square random number generator, Residue method, Arithmetic Congruential generator, Testing Numbers for Randomness, Chi-Square Test. (5)
**Distribution Functions**: Stochastic activities, Discrete probability functions, Cumulative distribution function, Continuous probability functions. Generation of random numbers following binomial distribution, poisson distribution, continuous distribution, normal distribution, exponential distribution, uniform distribution. (10)

**Simulation Languages**: Basic Introduction to Special Simulation Languages:- GPSS/ MATLAB/ Network Simulators. (5)

**Text Books**:

**References**:
2. Rudra Pratap: "Getting Started with MATLAB 7" Oxford University Press.

**Paper Title**: Object Oriented Analysis And Design

**Paper Code**: IT833  
**Max. Marks (Univ. Exam)**: 50  
**Max. Marks (Int. Exam)**: 50  
**Time**: 3 Hours  
**Total Lectures**: 45

**Part A**

**Object Oriented Concepts**

Difference between Procedure-Oriented and Object-Oriented Programming, Basic Concepts of Object Oriented Programming, Abstract data types: Object, Classes, Data Abstraction and Encapsulation, Inheritance, Polymorphism.

**C++ Programming Language and Functions**

Tokens, Keywords, Identifiers, Basic Data Types, User Defined Data Types, Derived Data Type, Variables, Scope Resolution Operator, Memory Management Operator, Manipulators, Type Cast Operator, Operator Overloading, Operator Precedence, Control Structure, Function Prototype, Call by Reference, Call by Value, Inline functions, Default Argument, Function Overloading.

**Classes and Objects**

Structures and Classes, Class declaration, Creating Objects, Assessing Class Members, Class Function Definition, Member Function Definition, Private and Public Member Function,
Nesting of Member Functions, Memory Allocation for objects, Array of objects, Objects as Function Arguments.

**Inheritance: Extending Classes**

Base and Derived Classes, Visibility Modes, Concept of Protected Member, Types of Inheritance- Single Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance.

**Operator overloading**

Definition, Overloading Unary Operators, Overloading Binary Operators, Type Conversions- Built in to Class Type, Class Type to Built in Type, One Class conversion to another Class.

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**Streams and Templates**

C++ Streams, C++ Stream Classes, Unformatted I/O Operations, Formatted I/O Operations, Manipulators, Templates.

**File Streams**

Classes for File Stream Operation, Opening and Closing a File, Detecting End-of-File, File Pointers and Manipulators, Functions- put() and get(), write() and read().

**Object Oriented Analysis and Object Oriented Design**

Object Oriented Notations and Graphs, Steps in Object Oriented Analysis, Steps in Object Oriented Design, System analysis, System Design, Object Design

**Object Oriented Methodologies**

OMT methodology, Object Model, Dynamic Model, Function Model, Relationship among models, Jacksons Model, Booch’s OOA and OOD approach.

**Recommended Books:**

<table>
<thead>
<tr>
<th>NAME</th>
<th>AUTHOR(S)</th>
<th>PUBLISHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>The C++ Programming Language</td>
<td>Bjarne Stroustrup</td>
<td>Addison Wesley, 2000</td>
</tr>
<tr>
<td>Objecting Modeling and Design</td>
<td>James, Rumbaugh, Michael Blaha, William Premerlani, Frederick Eddy and William Lorensen</td>
<td>PHI 1998</td>
</tr>
</tbody>
</table>
ELECTIVE III

Paper Title: Theory of Computation

Paper Code: IT834  Max. Marks (Univ. Exam): 50  Time: 3 Hours
Credits: 4  Max. Marks (Int. Exam): 50  Total Lectures: 45

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: To construct and prove the equivalence of languages described by finite state machines and regular expressions, pushdown automata and turing machines.

Part A
Introduction to finite automata: (12)
Strings, alphabet, language operations, finite state machine, finite automation model, acceptance of strings and language, deterministic finite automaton, deterministic finite automaton, equivalence between NFA and DFA, conversion of NFA into DFA, minimization of FSM, equivalence between two FSMs, Moore and Mealy machines.

Regular expressions and regular languages: (11)
Regular sets, regular expressions, identity rules, manipulation rules, manipulation of regular expressions, equivalence between RE and FA, inter conversion, pumping lemma, closure properties of regular sets (proofs not required), regular grammars, right linear and left linear grammars, equivalence between regular linear programming and FA.

Part B
Context free grammar and languages: (8)
Context free grammar, derivation trees, chomsky normal form, greibach normal form, push down automata, acceptance of CFL, equivalence of CFL and PDA, properties of CFL (proofs omitted)

Turing Machines: (7)
Turing machine definition model, design of TM, computable functions, recursive enumerable language, church-T hypothesis, counter machine, types of TM (proofs not required), chomsky hierarchy of languages, linear bounded automata and context sensitive language, introduction of DFCL and DPDA, LR(0) grammar

Undecidability: (7)
Undecidability, properties of recursive & non-recursive enumerable languages, universal Turing machine

Recommended Books:

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<tr>
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<th>PUBLISHER</th>
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<tbody>
<tr>
<td>Introduction to automata theory, languages and computation</td>
<td>Hopcroft H.E. &amp; Ullman</td>
<td>Pearson/Addison Wesley</td>
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<tr>
<td>An introduction to formal languages and automata</td>
<td>Peter linz</td>
<td>Jones &amp; Bartlett Learning</td>
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<tr>
<td>Introduction to languages and the theory of automata</td>
<td>John C Martin</td>
<td>McGraw-Hill</td>
</tr>
<tr>
<td>Elements of theory of computation</td>
<td>H.P. Lewis and C.H. Papadimition</td>
<td>Prentice-Hall</td>
</tr>
<tr>
<td>Theory of computation</td>
<td>Mishra &amp; Chandrashekharan</td>
<td>PHI Learning Pvt. Ltd</td>
</tr>
</tbody>
</table>

**Paper title: SOFT COMPUTING**

**Paper Code: IT824**

**Max. Marks (Univ. Exam): 50**

**Max. Marks (Int. Exam): 50**

**Total Lectures: 45**

**Time: 3 Hours**

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**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:** Introduce students to soft computing concepts and techniques and foster their abilities in designing and implementing soft computing based solutions for real-world problems.

**Part - A**

**Neural Networks:**


**Fuzzy Logic:**


**Operations on Fuzzy Sets:**

(05) Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations.

**Fuzzy Arithmetic:**


**Part – B**

**Fuzzy Logic:**

(05) Classical Logic, Multivalued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges.

**Uncertainty based Information:**

(05) Information & Uncertainty, Nonspecificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets.
Introduction of Neuro-Fuzzy Systems:  
Architecture of Neuro Fuzzy Networks.  

Application of Fuzzy Logic:  
Medicine, Economics etc.  

Genetic Algorithm:  
An Overview, GA in problem solving, Implementation of GA  

Books Recommended:  

Reference:  

Paper title: Mobile Apps Development  

Paper Code: IT834  
Max. Marks (Univ. Exam): 50  
Credits: 4  
Max. Marks (Int. Exam): 50  
Time: 3 Hours  
Total Lectures: 45  

L T P  3 1 0  

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: The students are exposed to essentials of mobile apps development. The core modules include designing, developing, testing, signing, packaging and distributing high quality mobile apps. The aim is to teach mobile app development using Android as the development platform.  

Part - A  

Getting started with Mobility  

(08)
Mobility landscape, Mobile platforms, Mobile apps development, Overview of Android platform, setting up the mobile app development environment along with an emulator, a case study on Mobile app development.

**Building blocks of mobile apps** (16)

- App user interface designing - mobile UI resources (Layout, UI elements, Draw-able, Menu), Activity states and life cycle, interaction amongst activities.
- App functionality beyond user interface - Threads, Async task, Services - states and life cycle, Notifications, Broadcast receivers, Telephony and SMS APIs
- Native data handling - on-device file I/O, shared preferences, mobile databases such as SQLite, and enterprise data access (via Internet/Intranet).

**Part – B**

**Sprucing up mobile apps** (08)

- Graphics and animation - custom views, canvas, animation APIs, multimedia - audio/video playback and record, location awareness, and native hardware access (sensors such as accelerometer and gyroscope).

**Testing mobile apps** (08)

- Debugging mobile apps, White box testing, Black box testing, and test automation of mobile apps, JUnit for Android, Robotium, MonkeyTalk.

**Taking apps to Market** (05)

- Versioning, signing and packaging mobile apps, distributing apps on mobile market place.

**Recommended Books:**

<table>
<thead>
<tr>
<th>NAME</th>
<th>AUTHOR(S)</th>
<th>PUBLISHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Apps Development, Edition I, 2013</td>
<td>Anubhav Pradhan</td>
<td>Anil V Deshpande</td>
</tr>
<tr>
<td>Android Application Development All in one for Dummies, Edition: I</td>
<td>Barry Burd</td>
<td>John Wiley &amp; Sons</td>
</tr>
<tr>
<td>Teach Yourself Android Application Development In 24 Hours, Edition: I</td>
<td>Carmen Delessio, Lauren Darcey, Shane Conder</td>
<td>SAMS</td>
</tr>
</tbody>
</table>
Paper Title: BUSINESS RESEARCH

Course : BE-MBA VIII th Semester

Paper – Compulsory

Paper Code: IBM- 801
Credits: 03

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 course teaches the students the methods of business / marketing research and how to effectively handle research projects

Internal Assessment: 50
External Assessment: 100

Part-A

Research Design formulation, Exploratory, Descriptive and Casual Research , Exploratory Research Design- Secondary Data ,Primary Data , Qualitative Research-Focus Group Interviews, Depth Interviews, Analysis of Qualitative Data, Survey and observation- Survey methods, Observation method, Casual Research Design- Experimentation, Validity in Experimentation, Extraneous variables, Statistical Designs-Randomized-Block Design, Latin Square Design, Factorial Design

Measurement and Scaling- Primary Scales of measurement, Comparative Scaling Techniques, Non comparative Scaling techniques-Likert ,Semantic Differential Scale, Stapel Scale, Questionnaire Design- question content, structure and order

Part-B

Sampling Design: Meaning and need of Sampling, Probability and non-probability sampling design, simple random sampling, systematic sampling, stratified sampling, cluster sampling and convenience,sampling , judgement and quota sampling (non-probability), determination of sample size, Hypothesis Testing, Parametric and Non-Parametric Tests

Discriminant and Logic Analysis- Formulating the problem for Discriminant analysis ,Multiple Discriminant Analysis, Logit model

Factor analysis, Cluster analysis and Multidimensional Scaling - Conducting Factor analysis, Cluster analysis and Multidimensional Scaling- Conjoint Analysis

Recommended Books:
2. Marketing Research - Text and Cases, Rajendra Nangundkar, TMH
3. Marketing Research – GC Beri, TMH
4. Marketing Research- Parshuram, Dhruv Grewal, R. Krishnan – Biztantra

Paper Title: FINANCIAL MANAGEMENT

Course: BE-MBA VIII th Semester

Paper – Compulsory

Paper Code: IBM- 802 Time: 3 Hours
Credits: 03

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: In the course foundation is built for financial analysis. The various aspects of Financial Management are introduced.

Internal Assessment: 50
External Assessment: 100

Part-A

Introduction to Financial Management: Meaning; Scope; Finance Function; Financial Goals; Agency Problem; Relationship of Finance with Accounts and Economics.

(4)

Sources of Finance: Features; Advantages and Limitations of Equity Shares; Preference Shares; Debentures; Term-Loans; Right Issue.

(3)

Cost of Capital: Meaning; Calculation of Cost of Debt Capital; Equity Capital; Preference Capital; Retained Earnings; Weighted Average Cost of Capital.

(6)

Capital Structure: Meaning; Determinants; Assumptions; Net Income and Operating Income Approach; Traditional Position; M-M Position; EBIT and EPS Analysis; Capital Structure and Taxation.

(3)

Leverage Analysis: Meaning; Types; Estimation of Financial; Operating and Combined Leverage; Relation of Financial Leverage with Risk and Return.

(3)
Management of Working Capital: Meaning of WC; Need of WC Management; Determinants of WC; Operating Cycle; Estimation of WC. (5)

Part-B

Inventory Management: Meaning; Need to hold Inventory; Objective of Inventory Management; Inventory Investment Analysis; Inventory Control System. (6)

Capital Budgeting: Meaning; Basic Principles of Costs and Benefits; Investment Criteria; Pay back Method; Accounting Rate of Return Method; Net Present Value Method; Benefit-Cost Ratio; Internal Rate of Return; Capital Rationing; Introduction to Basic Techniques of Risk Analysis in Capital Budgeting. (7)

Dividend Decisions: Meaning and Types of Dividend; Issues in Dividend Policy; Traditional Model; Walter Model; Gordon Model; Miller and Modigliani Model; Bonus Shares and Stock Splits. (8)

References:
1. Financial Management, Van Horne, PHI

SYLLABUS FOR B.E.M.B.A (IT) Ninth Semester

Paper Title: QUANTITATIVE TECHNIQUES FOR MANAGEMENT (Compulsory)

Course: BE-MBA IX th Semester

Paper – Compulsory

Paper Code: IBM-901

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 course is to introduce to the students the quantitative skills required by managers.

Internal Assessment: 50

Part-A

External Assessment: 100
**Linear Programming**- Equation formulation, Graphical solution of two-variable linear programming problems, Simplex algorithm, Transportation and Assignment problems.  

(8)

**Game theory**- Game models, zero sum games, dominance rule, 2 x n and m x 2 games, solution of m x n games 

(8)

**Queuing:** Single channel single-phase queuing system, multichannel single-phase queuing system, single channel multiphase queuing system  

(8)

**Part-B**

**Markov Chains**- Markov processes, Markov analysis, input transition probabilities, input conditions, output-specific state probabilities, steady state probabilities, absorbing chains  

(9)

**Simple linear regression and multiple regression analysis** (with two independent variables), specification of regression models and estimation of parameters, interpretation of results  

(6)

**Forecasting models**- Moving-average forecast methods, Simple Exponential Smoothing, Holt’s method- Exponential Smoothing with trend, Winter’s Method- Exponential Smoothing with Seasonality  

(10)
Recommended Books:

1. Business Forecasting : John.E.Hanke , Dean.W.Wichern , PHI
2. Statistics for Managers using Microsoft Excel : Levine, Stephan, Krehbiel, Brenson , PHI

Paper Title: Project Management & Entrepreneurship

Paper: Compulsory

*Paper Code: IBM-902*  
*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 course introduces the students to the important aspects of managing a project and skills needed to be an entrepreneur

**Part –A**

**Market and Technical Analysis:** Market and Demand Analysis  Market Survey, Demand Forecasting, Uncertainties in Demand Forecasting; Technical Analysis-Product Mix, Plant Capacity, Materials and Inputs, Machinery and Equipment.  

**Project Costing and Finance:** Cost of project; Cost of production; Break even Analysis; Means of Financing Project; Tax Aspects in Project Finance; Role of Financial Institution in Project Finance.  

**Project Appraisal:** Time Value of Money; Project Appraisal Techniques  Playback Period, Accounting Rate of Return, Net Present Value, Internal Rate of Return, Benefit Cost Ratio; Social Cost Benefit Analysis; Effective Rate of Protection.  

**Risk Analysis:** Measures of Risk; Sensitivity Analysis; Simulation Analysis; Decision Tree Analysis.  

**Project Scheduling/Network Techniques in Project Management:** CPM and PERT Analysis; Float times; Crashing of Activities; Contraction of Network for Cost Optimization, Updating; Cost Analysis of Resources Allocation.
Part-B

Entrepreneurial Motivation Theories - Entrepreneurial Competencies - Developing Competencies - Role of Entrepreneur. Development Programs - Assistance Programs for Small Scale Units - Institutional Framework - Role of SSI Sector in the Economy - SSI Units - Failure, Causes and Preventive Measures - Turnaround Strategies. (6)


Institutions for - entrepreneurship development, Role of constancy organizations - Role of financial institutions - Bank finance to entrepreneurs, Making a business plan, Entrepreneurship development: Role of Government in supporting entrepreneurship programs in the country. (6)

References:

Paper Title: SUPPLY CHAIN MANAGEMENT

Course: BE-MBA IX th Semester

Paper: Elective-Marketing

Paper Code: IBM-903

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: Supply Chain Management has become a critical function for organizations in today's competitive world. Students learn the concepts of managing the chain.

Internal Assessment: 50

External Assessment: 100

Part –A

Definition of Supply Chain Management and Logistics - Scope of Transportation, Relationship between transportation and other business functions, Transport Economics: Distance - volume-density, Freight Cost - Handling - Liability - market factors; Third party logistics (3 PL) & fourth party logistics service provider (4 PL), Logistics equipment; Reverse
Logistics, Govt. rule & regulations related to Logistics; Documentation related to Transportation :- Bill of Lading, Freight Bill, Claims and F.O.B Terms of Sale, Legal Classification of carriers- Private, Contract carrier etc. (10)

**Inventory Control, Planning & Managing Inventories:** Strategic role of stock, costs of holding stock, Economic Order Quantity (EOQ), uncertainty in demand and costs, models for known demand: price discount from suppliers, planned shortages and back-orders, models for uncertain lead time demand. (8)

**Material Handling & Wastage Control:** Packing & Packaging; Order Management; Competitive advantage through logistics and supply chain management; Responsive Supply Chain, RFID applications in Supply Chain. (7)

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**Part –B**

**Network Design and Facility Location** Facility location analysis, Optimization models, Heuristic Modeling - Grid Technique. Information systems for Supply Chain Management-Contemporary Logistics Information Technologies, e-enabled logistics management and tracking systems. (10)

**Planning & Sourcing in Supply Chain:** Planning demand and supply: Demand forecasting Type and Time horizon of forecast and category of forecasting, aggregate planning; Strategic sourcing: Sourcing decision in Supply Chain- selection of source, technical up-gradation of vendor, vendor performance evaluation, vendor rationalization. (10)

**References:**

1. Designing & Managing the Supply Chain, Simchi-Levi, David, TMH
2. Inventory Control and Management, Donald Waters, Wiley
Paper Title: SERVICES MARKETING

Course : BE-MBA IX th Semester

Paper: Elective-Marketing

Paper Code: IBM- 904 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: This course introduces the students to important function area of services marketing. Services are intangible in nature and its management is an important part of the marketing portfolio.

Internal Assessment: 50 External Assessment: 100

Part-A

Marketing of services - Introduction - Growth of the Service Sector - The Concept of Service - Characteristics of Services-Classification of Services - Designing the Service-Blueprinting, Using Technology, Developing Human Resources, Building Service Aspirations. (8)

Marketing Mix in Services Marketing - The Seven Ps - Product Decisions, Pricing Strategies and Tactics, Promotion of Services and Placing or Distribution Methods for Services - Additional Dimensions in Services Marketing - People, Physical Evidence and Process. (7)

Strategic Marketing Management for Services - Matching Demand and Supply through Capacity Planning and Segmentation - Internal Marketing of a Service - External versus Internal Orientation of Service Strategy. (10)

Part –B


Quality Standards, Factors and Solutions Í Quality standards in Service delivery, External Communication to the Customer: the Promise versus Delivery Gap - Developing Appropriate and Effective Communication about Service Quality. (4)

Marketing of Services with special reference to (a) Financial Services (b) Health Services (c) Hospitality Services including Travel, Hotels and Tourism. (d) Professional Services (e) Public Utility Services (f) Communication Services (g) Educational Services (10)
References

Paper Tile: ADVERTISING AND SALES MANAGEMENT

Course: BE-MBA IXth Semester

Paper: Elective-Marketing

Paper Code: IBM- 905
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: Advertising and Sales Management are important components of the Marketing strategy of a company. This course introduces the students to these important functions.

Internal Assessment: 50
External Assessment: 100

Part-A

Advertising: As an element in Marketing Mix, its role and importance; Advertising as a means of communication, Setting advertising objectives, DAGMAR approach to setting objectives. Preparing advertising plan, Developing message, writing copy, advertising appeals and per-testing and post-teaching copy (10)

Media decisions, media strategy and scheduling decisions: Planning and managing advertising campaigns; Different types of advertising, public relations; Industrial advertising; advertising budget and relevant decisions; Advertising agencies; their role and importance; management problems of agencies; client-agency relations; advertising in India, problems and prospects. (15)

Part-B

Sales Management: Size of the sales force, sales organization based on customer, geography, product and combinations and current trends in sales training programs and motivating the sales force in sales force compensation, sales incentives and sales force evaluation in controlling the sales effort in sales quotas, sales territories, sales audit,
selecting channel members, setting distribution objectives and tasks. Target markets and channel design strategies. (8)

**Product, Pricing and Promotion issues in Channel Management and Physical Distribution** - Motivating channel members. Evaluating channel member performance. Vertical marketing systems. Retail co-operatives, Franchise systems and corporate marketing systems. (7)

**E-commerce and e-retailing as a channel of distribution**, Electronic intermediaries, Disintermediation and Re-intermediation (5)

**References:**

1. Advertizing and Promotion: An integrated marketing communication perspective, George Belch, M.Belch, K.Purani
3. Sales Management: Concept and Cases, W.L. Cron, Wiley

**Paper Tile: INDIAN FINANCIAL SYSTEM**

**Course**: BE-MBA IX th Semester

**Paper**: Elective-Finance

**Paper Code: IBM- 906**

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 course is to introduce the components of Indian Financial System and their working.

Internal Assessment: 50  
External Assessment: 100

**Part-A**

**Commercial Banking** - Evolution, Financial Services, Fiduciary Services, Off-balance Sheet Activities, Analysis of Assets and Liabilities of Scheduled Commercial Banks; Reserve Bank of India-Central Banking - Introduction to Central Banking, Instruments of Monetary Control, Public Debt, Secondary Debt Market, REPOs, Reserve Requirements, Selective Credit Controls, Advances to Priority Sector, Supervision System; Regional Rural Banks - Objectives, RBI Assistance, Evaluation of RRBs. (10)
Cooperative Credit- Introduction, Role of RBI, Organizational Structure, National Bank for Agriculture and Rural Development (NABARD), Reforms in Cooperative Credit. (8)

Non-banking Finance Companies ñ Introduction, Definition of Non-banking Finance Company, Financial Sector Reform, Liberalization Measures for NBFCs, Regulations for NBFCs Accepting Public Deposits, Limits on Acceptance of Deposits, Size of Non-banking Companies, Deposits, Distribution of Deposits, Comparison of NOF and Deposits, Capital Issues by Finance Companies, FCNR Deposits for NBFCs, Assets of NBFCs, Investment Norms for NBFCs, Deployment of Funds, Funds Mismatch of HP/Leasing Companies. (9)

Part-B


References :

1. Indian Financial System, Markets, institutions and services, B.V.Pathak, Pearson
2. Indian Financial Systems & Markets, S.Saha, Tata Mcgraw Hill
3. Indian Financial System, M.Y.Khan, Tata Mcgraw Hill

Paper Title: MANAGEMENT OF FINANCIAL SERVICES

Course : BE-MBA  IX th Semester

Paper: Elective-Finance

Paper Code: IBM- 907

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: Management of Financial Services is an important component of Business Finance. This course introduces the students to this component.

Internal Assessment: 50

External Assessment: 100

Part-A

Financial Services - Meaning, types and their importance, Securities Trading - Online Vs Offline Trading, Demat and Remat, Depository - Introduction, Concept, depository participants, functioning of depository systems, process of switching over to depository systems, benefits, depository systems in India, SEBI regulation. (8)

Insurance Services- Introduction, Principles of insurance, Types of Insurance, Life Insurance Products- Traditional and ULIPs, Credit rating - the concept and objective of credit rating, various credit rating agencies in India and International credit rating agencies, factors affecting credit rating & procedural aspects. (8)

Part-B

Leasing - concept and development of leasing, business, difference between leasing & hire purchase, types of leasing business, advantages to lessor and lessee. (8)

Venture capital - concepts and characteristics of venture capital, venture capital in India, guidelines for venture capital. (7)

Call money market, Treasury bill market, Commercial Bill market, Market for CPs and CDs, Discount market and market for financial guarantees, Factoring - Development of factoring types & importance, procedural aspects in factoring, financial aspects, prospects of factoring in India. (7)

Plastic Money - Concept and different forms of plastic money - credit and debit cards, pros and cons. Credit process followed by credit card organizations. Factors affecting utilization of plastic money in India. (7)

References:

1. Financial services & system, S Gurusamy McGraw-Hill
2. Financial Instruments and services, Nalini P T PHI
3. Financial Services, M Y Khan Tata McGraw-Hill
Paper Title: STRATEGIC FINANCIAL MANAGEMENT

Course: BE-MBA X th Semester

Paper: Elective-Finance

Paper Code: IBM- 908  Time: 3 Hours

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: Strategic Financial Management is an important component of the Financial Portfolio. This course explains the working of this component.

Internal Assessment: 50  External Assessment: 100

Course Duration: 45 Lectures of one hour each.

Part-A

Options, Futures and Corporate finance: call options, put options, valuing options, option pricing formula, stocks and bonds as options, capital structure policy and options (8)

Warrants and convertibles: difference between warrants and call options, warrant pricing and Black-Scholes model, value of convertible bonds (5)

Derivatives and Hedging risk: forward contracts and futures contracts, interest-rate futures contracts, duration hedging (9)

Part-B


International Corporate Finance: Foreign exchange markets and exchange rates, law of one price and purchasing-power parity, interest rates and exchange rates, interest rate parity, international bond marketing. (11)

References:

1. Mergers, Restructuring and Corporate Control, Weston, Chung, Hoag , PHI
2. Corporate Finance, Ross, Westerfield, Jaffe, TMH
Paper Title: E-COMMERCE

Course: BE-MBA IXth Semester

Paper: Elective-IT

Paper Code: IBM-909

Time: 3 Hours

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: E-commerce has gained tremendous importance in today’s business scenario. Various techniques/methodologies are discussed in this subject.

Internal Assessment: 50
External Assessment: 100

Course Duration: 45 Lectures of one hour each.

Part-A

Ecommerce terminology: Blogs, Message boards, Newsgroups, Banner Advertising, Spiders / crawlers/ robots, hacking, SSL / SET protocols, Escrow, Podcast, webcast, web beacons, spyware, Adware, RSS feed, Spam, Web agents, cookies, search engine, worms (2)

Planning for a Ecommerce: Value chain analysis, SWOT analysis, studying trends and current technology, government incentives, hardware and software assessment for building a web store, intermediaries in Ecommerce (8)

Characteristics of E-Business markets: Various business models, Business model design, pricing and distribution of digital products, bundling, building customer traffic, subscription vs paid model, bricks and clicks business model, call centre integration in ecommerce, affiliate marketing, viral marketing (10)

Part-B

Security in ecommerce transactions: Public key infrastructure, process of getting a digital signature in India, types of digital signatures, role of intermediaries like Verisign (6)

Internet audience: study of internet audience, online consumer behavior, Online research: Click stream analysis, Search log analysis, emails, pop-ups, online focus group (10)

Online payment systems: On-Line Electronic Cash, Electronic Payment Schemes, Credit card secure electronic transaction, e-cheque, accumulating balance payment system, stored value payment system, digital wallets (9)
References

1. E-commerce Management, Text and cases, Sandeep Krishna Murthy, Cengage
3. Ecommerce, Strategy, Technology and Implementation , Gary.P.Schneider, Cengage
4. Web commerce Technology Handbook , Daniel Minoli, Emma Minoli, TMH

Paper Title: IT PROJECT MANAGEMENT

Course : BE-MBA IX th Semester

Paper: Elective-IT

Paper Code: IBM-910 Time: 3 Hours

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: Managing the IT project is critical in delivering the end product. This subject introduces to the students as to how to manage the IT project.

Internal Assessment: 50

External Assessment: 100

Course Duration: 45 Lectures of one hour each.

Part-A

Software development process: waterfall model, prototyping, spiral model, software configuration management process, process management- capability maturity model,

Software requirement analysis and specification: problem analysis, data flow diagram, entity-relationship modeling, decision tables, creating a requirement document

Planning a software project: cost estimation-COCOMO model, schedule and milestones, personnel plan, software quality assurance plans, configuration management plans, project monitoring plans, risk management
Part-B

**Function-Oriented design:** Modularity, Top-down and bottom-up strategies, structure charts, first-level factoring, design heuristics, Metrics- network metrics, stability metrics, information flow metric

(8)

**Object oriented design (OO):** classes and objects, encapsulation, inheritance and polymorphism, OO design notation and specification, dynamic modeling, metrics- Weighted Methods per Class (WMC), Depth of Inheritance (DIT), Number of Children (NOC), Coupling between Classes (CBC)

(9)

**Software testing:** error, fault and failure, top-down and bottom-up approaches, test cases and test criteria, functional testing- equivalence class partitioning, cause-effect graphing, structural testing-control based criteria, data flow based criteria

(5)

**Software delivery:** models, managing IT project teams

(2)

**References:**

1. Software Engineering, Ian Sommerville, Addison-Wesley
2. Software Engineering Project Management, R. Thayer, Wiley

Paper Title: DECISION SUPPORT SYSTEMS

Course: BE-MBA IX th Semester

Paper: Elective-IT

_Paper Code: IBM- 911_  
_Time: 3 Hours_

**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:** With today’s systems having great computing power, the DSS has assumed even greater significance. This course introduces to the students the criticality of decision making using computers.

Internal Assessment: 50  
External Assessment: 100

Course Duration: 45 Lectures of one hour each.
Part-A

**Distinction between Transaction Processing System (TPS), Management Information System (MIS), Expert System (ES) and Decision Support System (DSS)** (5)

**Architectures of DSS system**: components, classifications, backend and front end components of DSS, Web based DSS, Group Decision Support System (GDSS), technologies and infrastructure for group decision making, distributed computing (6)

**Modeling for DSS**: the decision making modeling process, Intelligence, design and choice phases, design under certainty, risk and uncertainty, sensitivity analysis, what-if, goal-seek and scenario analysis with spreadsheets (10)

**DSS design to support operational**, tactical and strategic decision making (2)

**DSS design methodology for Healthcare**, Insurance, Manufacturing and Education sectors (4)

Part-B

**Enterprise Decision Support System (EDSS)**: Characteristics and capabilities of EDSS, integrating DSS and EDSS, Computerized systems like CRM, ERP, MRP and their design basics, EDSS and supply chain, Corporate Enterprise portals and their design, Electronic Document Management (EDM) systems (12)

**Importance of Knowledge Management Systems (KMS)** and its integration with DSS. Design of Knowledge Management System for different sectors, Artificial Intelligence based DSS systems. (6)

**References:**

1. Decision Support Systems and Intelligent Systems, E.Turban, J.E.Aronson, Pearson
Paper Title: TRAINING AND DEVELOPMENT

Course : BE-MBA IX th Semester

Paper: Elective-HR

Paper Code: IBM- 912

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: Training and development is an important component of the HR portfolio. This course introduces the students to the importance of designing good training systems.

Internal Assessment: 50

External Assessment: 100

Part-A

National Training Interventions : Training as an economic instrument, achievements and challenges, National initiatives : 1964 to the present day, the European scene, which way forward. (4)

Attitudes Towards Education and training : Education, training and work, changes in attitudes to training and development, Philosophies of training. Learning and Training : What do we understand by learning, Reinforcement theories, cybernetic and information theories, cognitive theories and problem solving, experimental learning, Learning to learn and self-development, Mental process, other horizons. (8)

The Learner and the Organization : The learner, the organization as a learning environment, the learning organization. Approaches to Training Interventions : Organization learning systems, Generalized approaches, Planned training interventions, the costs and benefits of training interventions. (10)

Part-B

The Training Function in Organizations : The training function, Management's responsibility for training, Creating and appropriate structure, The training of training staff, Ethical standards (4)

Assessing Organizational Training Needs : The levels of organizational needs, types of organizational reviews, before starting the review, reasons for an organizational review, carrying out an organization-wide review. (4)
Training Policy, Plans and Resources: Training policy, policy development, annual training plan, training resources, from policy to training plan and budget, Assessing Training Needs-the job and the individual: Job training analysis, Analytical techniques, Carrying out an individual training needs analysis, assessing performance. (10)

Determining and evaluating training interventions: Training interventions, determination of training objectives, determination of the appropriate training strategy, planning and implementation of the training, evaluation of the programme. (5)

References:

1. Effective training, systems, strategies and practices, P.N.Blanchard, J.W.Thacker, V.A.Ram, Pearson

Paper Title: ORGANIZATIONAL CHANGE AND DEVELOPMENT STRATEGIES

Course: BE-MBA IX th Semester

Paper: Elective-HR

*Paper Code: IBM-913* 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: Organization change is important in today’s rapidly changing world. This course equips the students with techniques to manage change effectively.

Internal Assessment: 50 External Assessment: 100

Part-A

Values, Assumption, And Beliefs in OD- Chronology of Events in Management and organization Thought, early Statement of OD values and assumptions, A Values Study.


OD Interventions : Thinking about OD Interventions, Classifying OD Interventions.

Part-B


Intergroup and Third-Party Peacemaking Interventions : Intergroup Team-Building Interventions, Third party Peacemaking Interventions ,organization Mirror Interventions, Partnering.


References:

1. Organization development and transformation ïManaging effective change , W.French,C.Bell, R.Zawacki
2. An experiential approach to Organization Development ï D.R.Brown, D.Harvey, Pearson

Paper Title: INDUSTRIAL PSYCHOLOGY

Course : BE-MBA IX th Semester
Paper: Elective-HR

Paper Code: IBM-914

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: Industrial psychology equips the students with techniques / methodologies for handling this component in organization.

Internal Assessment: 50

External Assessment: 100

Part-A

Nature and scope of Industrial Psychology: Psychology and management, contributions of Freud and post Freudian development of Psychology

Factory organization: industrial bureaucracy, formal and informal groups, status system, balancing of social power, union and employer’s organizations

Psychology of leadership: understanding and motivating employees, industrial morale and job satisfaction, counseling, Psychology of industrial conflict, stress management

Part-B

Personality: Idiographic approach, Nomothetic approach, psychoanalytical perspectives, levels of awareness, defence mechanism, projective tests, Rorschach test, Thematic Appreciation Test (TAT), Role playing or visualization, stereotyping, brand personality

Trait perspective: Allport’s trait categories, Catell’s 16 PF test, personality tests, personality questionnaire, Type perspective- four humours, Sheldon’s typology, Eysenck’s typology, Factor theory, Jung’s typology, Allport’s typology.

Intelligence: models, Stanford-Binet intelligence scale, Wechsler scale, Emotional intelligence

References:

1. Psychology in Organizations, S. Alexander Haslam, Sage publications
Paper Title: SUMMER TRAINING

Course: BE-MBA IX th Semester

Paper: Compulsory

Paper Code: IBM-915

Objective: To expose the student to working of business functional areas in corporate / organizations.

Internal Assessment: 200

The students would submit a report of the summer training and give viva-voce for the same.
SYLLABUS FOR B.E.M.B.A (IT) Eighth Semester

STRATEGIC MANAGEMENT

Course : BE-MBA Xth Semester

Paper – Compulsory

Paper Code: IBM-1001
Time: 3 Hours

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: Strategic Management assumes great importance in today’s world of managing resources. This course introduces the students to this important component.

Internal Assessment: 50
External Assessment: 100

Course Duration: 45 Lectures of one hour each.

Part –A

Definition, nature, scope, and importance of strategy; and strategic management (Business policy), Strategic decision-making. Process of strategic management and levels at which strategy operates, Role of strategists, Defining strategic intent: Vision, Mission, Business definition, Goals and Objectives. (6)

Environmental Appraisal Concept of environment, components of environment (Economic, legal, social, political and technological). Environmental scanning techniques- ETOP, QUEST and SWOT (TOWS) PEST. (7)

Internal Appraisal The internal environment, organizational capabilities in various functional areas and Strategic Advantage Profile. Methods and techniques used for organizational appraisal (Value chain analysis, Financial and non financial analysis, historical analysis, Industry standards and benchmarking, Balanced scorecard and key factor rating). Identification of Critical Success Factors (CSF). (8)

Part –B

Corporate level strategies Stability, Expansion, Retrenchment and Combination strategies. Corporate restructuring, Concept of Synergy ,Business level strategies Porter framework of competitive strategies, Conditions, risks and benefits of Cost leadership, Differentiation and Focus Strategies. Location and timing tactics. Concept, Importance, Building and use of Core Competence. (8)

Strategic Analysis and choice Corporate level analysis (BCG, GE Nine-cell, Hofer product market evolution and Shell Directional policy Matrix), Industry level
analysis, Porters\' five forces model, Qualitative factors in strategic choice. Strategy implementation: Resource allocation, Projects and Procedural issues. (8)

**Strategic Management of Technology and Innovation**- Licensing new technology, imbibing new technology, searching for strategic partners in new business areas, Internal and external sources of technology, linking new technology and novel customer needs, building competence through new product development, technological innovation and strategy. (8)

**Recommended Text Books**


**Paper Title:** GLOBAL MARKETING

**Course:** BE-MBA Xth Semester

**Paper:** Elective-Marketing

**Paper Code:** IBM-1002 **Time:** 3 Hours

**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:** With global trade increasing many fold global marketing has assumed great importance. This course introduces the students to this important aspect.

Internal Assessment: 50  
External Assessment: 100

Course Duration: 45 Lectures of one hour each.

**Part-A**

**Global Marketing:** Development of Global Marketing, market characteristics, Industry conditions, marketing infrastructure, regulatory framework, basis for trade-absolute vs comparative advantage, protectionism and trade restrictions, tariffs, quotas, GATT (8)
Selecting markets: list of selection criteria, market index for country selection, grouping global markets, consumer market, business market and government market, categorizing global marketing mindsets, global market entry strategies- exporting, local production, ownership (10)

Pricing for global markets: transportation cost, tariffs, taxes, local production costs, channel costs, market and environmental factors affecting price, determining transfer prices, dealing with parallel imports or gray markets, sources of finance- commercial banks, government sponsored financing (8)

Part-B

Developing new products for global markets: three strategic choices- extension, adaptation, invention, role of foreign subsidiaries in R&D, acquisitions as a route to new products, joint venture route to new products, concept test, test marketing (7)

Developing a global distribution strategy: distribution density, channel length, channel alignment, distribution logistics, locating and selecting channel partners (6)

Planning and controlling global marketing: selecting control metrics, resolving conflicts between headquarters and subsidiaries (6)

References:

2. Global Marketing, Johny K.Johansson, TMH

Paper Title: CONSUMER BEHAVIOR

Course: BE-MBA X th Semester

Paper: Elective-Marketing

Paper Code: IBM- 1003 Time: 3 Hours

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: Consumer behavior makes us aware about how consumers thing and act. This knowledge can be used to make more informed decisions.
Internal Assessment: 50                      External Assessment: 100

Course Duration: 45 Lectures of one hour each.

**Part-A**

**Current trends in Consumer Behavior (CB),** Consumer empowerment through the web, Information bank for understanding CB, consumer need arousal, need recognition, consumer Psychological set, consumer information search and processing, Brand evaluation, Purchase and post purchase behavior (9)

**Consumer learning,** Habit and Brand Loyalty, unplanned purchase behavior, strategic implications of low-involvement decision making, situational influences, use of situational variables in marketing strategy, consumer perception, perception interpretation, price perception, Attitude development for change, lifestyle and personality (10)

**Part-B**

**Group and culture influences,** culture values, cross-culture values, subculture influences, reference group influences, House-hold decision making, group communication, word of mouth as diffusion process, Market segmentation and Micromarketing (9)

**Marketing communication process** ų source effects in marketing communication, message effects, media effects, consumer decoding of marketing communication, Alternatives evaluation and selection- how consumers make choices, evaluation criteria, decision rules for Attribute based choices (10)

**Consumer Rights and Social responsibility** (7)

**Recommended Books:**

1. Consumer Behavior ų Insights from Indian Market, Majumdar, PHI
2. Consumer Behavior ų A Strategic Approach, Henry Assael, Biztantra (Dreamtech)
Objectives: Investment analysis and Portfolio management are important aspects of Financial Management. This course equips the students with the knowledge base to make informed decisions.

Internal Assessment: 50

External Assessment: 100

Part-A


Risk and Return: Concept of Risk, Components of Investment Risk, Measurement of Risk through Standard Deviation, Regression Equation, Covariance, Concept of Return, Expected Yield, Actual Yield, Holding Period Yield, Relationship between Risk and Return (5)


Company Analysis: Meaning of Company Analysis, Strategy Analysis, Accounting Analysis, Financial Analysis, and Estimation of Intrinsic Value. (3)

Part-B

Portfolio Theory: Merits of Diversification: Diversification and Portfolio Risk, Portfolio Return and Risk, Calculation of Portfolio Risk, Efficient Frontier for two securities, Efficient Frontier for n-securities, Optimal Portfolio. (4)

Portfolio Analysis: Concept of Traditional and Modern Portfolio Analysis, Markowitz Theory Risk–Return Optimisation, Single Index Model, Beta Generation in Efficient Frontier, Three securities Model, Interactive Risk through Covariance, Correlation Co-efficient, Sharpe’s Model. (5)

Portfolio Selection: Concept of Portfolio Selection, Optimal Portfolio, Objectives, Risk and Investor Preferences, Investment Constraints, Cut-off Rate and New Securities, Efficient Frontier and Portfolio Selection, Beta, Traditional Portfolio Building, Capital Market Theory, CAPM, SML, Forms of CAPM, Zero Beta CAPM, Tax adjusted CAPM, Arbitrage Pricing Theory. (6)

Portfolio Revision: Meaning, Need, Techniques of Portfolio Revision, Formula Plans, Rules Regarding Formula Plans, Constant Rupee Value Plan, Constant Ratio Plan, Variable Ratio Plan, Modifications, Rupee Averaging Technique. (5)

Reference Books:

2. Investment Management - Lofthouse, Stephen, John Wiley & Sons Publications

Paper Title: INTERNATIONAL FINANCIAL MANAGEMENT

Course : BE-MBA Xth Semester

Paper: Elective-Finance

Paper Code: IBM-1005

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: This course introduces the important aspects of International Financial Management. It equips the students with knowledge base important to take effective decisions.

Internal Assessment: 50

External Assessment: 100
Part-A

Global Financial markets and interest rates: domestic and offshore markets, Euromarkets, Interest rates in the global money markets, money market instruments

Foreign exchange market: types of transactions and settlement dates, exchange rate quotations and Arbitrage, exchange rate determination and forecasting

Forwards, Swaps and Interest parity: Swaps and deposit markets, interbank forward dealing, option forwards, Exchange Rate Agreements and Foreign Exchange Agreements (FXA), Forward currency markets in India

Part-B

Currency and Interest rate futures: futures contracts, markets and trading process, future prices expected spot prices and forward prices, option pricing models, Over the Counter (OTC) market prices

Hedging, Speculation and Management of Transaction exposure: Hedging with money market, currency options, currency futures, internal hedging strategies

Management of Interest Rate Exposure: Forward Rate Agreements (FRAs)

References:
1. International Financial Management, P.G.Apte, Tata McgrawHill
2. Multinational Financial Management, Shapiro, Wiley

Paper Title: ERP

Course: BE-MBA Xth Semester

Paper: Elective-IT

*Paper Code: IBM- 1006 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: With the organizations integrating their operations ERP assumes great importance. This paper introduces this important aspect.
Internal Assessment: 50

Part-A

**ERP Package selection**: Need assessment, Justifying ERP implementation, cost benefit analysis, ERP package evaluation and selection, make or buy decision

(8)

**ERP systems development process**: ERP implementation life cycle, planning, requirement analysis, reengineering vs customizing, transition strategies- big bang, phased, parallel, hybrid, implementation-hidden costs

(8)

**ERP systems**: Sales and Marketing- sales and distribution, sales forecasting, product pricing systems, billing systems ERP and Customer Relationship Management (CRM), Accounting and Finance- cash management process, capital budgeting process, financial accounting and management accounting Production and Materials management- MRP system, capacity planning process, manufacturing execution systems, Human Resources-compensation and benefits administration

(12)

Part-B

**Managing an ERP project**: Risks in ERP implementation, managing large scale ERP projects, project team selection, user training, technological challenges, operation and up gradation issues

(10)

**Role of consultants and vendors**: maintenance of ERP system, future trends and directions in ERP, open source ERP systems

(7)

**References**:

1. Enterprise Resource Planning, Mary Sumner, Pearson
2. Enterprise Resource Planning, Alexis Leon, TMH
3. Class A ERP Implementation- Integrating Lean and 6 sigma, S. Donald, Cengage India
Paper Title: DATA WAREHOUSING & DATA MINING

Course: BE-MBA  X th Semester

Paper: Elective-IT

Paper Code: IBM-1007  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: With high computing power available at low cost Data Warehousing and Data Mining assumes great importance. This subject introduces the basics of this important aspect.

Internal Assessment: 50  External Assessment: 100

Part-A

Data Warehousing (DW): components of DW, DW and data marts, planning for DW, specifying business requirements, DW and Meta Data, dimensional modeling, slowly changing dimensions type1, 2 and 3, factless fact tables, aggregate fact tables, data extraction, transformation and loading (ETL), ETL tools, indexing the DW, DW and OLAP (12)

Data mining: preprocessing data for data mining, descriptive data summarization, data cleaning, prediction modeling with simple linear regression and multiple regression, logistic regression (8)

Classification data mining modeling: classification by decision tree induction, tree pruning, Bayesian classification, classification by back propagation in Neural networks (8)

Part-B

Mining frequent patterns and associations: market basket analysis, Apriori Algorithm, web mining, web log analysis, text mining (7)

Cluster analysis: interval scaled variables and binary variables, cluster analysis by partitioning, hierarchical methods, density based methods, clustering based on distance (8)

Open source data mining software and proprietary software (2)
References:

1. Data Mining: Concepts and Techniques, J. Han, Micheline Kamber, Elsevier
2. Data Mining Methods and Models, Daniel T. Larose, Wiley
3. Data Mining: Galit Shimuli, Wiley

Paper Title: STRATEGIC HUMAN RESOURCE MANAGEMENT

Course: BE-MBA Xth Semester

Paper: Elective-HR

Paper Code: IBM-1008 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: Strategic Human Resource management is an important aspect of the HR portfolio. This is because of globalization of organizations assuming importance in today's world.

Internal Assessment: 50 External Assessment: 100

Part-A

Introduction to Strategic Human Resource Issues, Challenges of Career development, Diverse workforce development, self development, Pay-performance systems, Types of Pay-performance plans: individual based, team based, plant wide and corporate level (10)

Hofstede's cultural orientation model, FIRO-B questionnaire, Johari Window questionnaire, HR metrics and importance, Factor analysis in HR Research, competency mapping models and framework (10)

Part-B

Determining the mix of Host-country and expatriate employees, the challenges of expatriate assignments, selective training, career development and compensation of expatriate employees, developing a global HR system and pay system, international staffing managing diversity, off shoring, equal employment opportunities, repatriation problems and solutions, HR strategies and orientation for Mergers (14)

Managing employee separation, Downsizing and outplacement, cost and benefits of employee separation, types of early separation (voluntary and Involuntary), features
of early retirement policies, managing layoffs, alternatives to layoffs, the goals of outplacement.

**Recommended Books:**

3. Human Resource Research methods, Dipak Kumar Bhattacharyya, Oxford

**Paper Title:** MANPOWER PLANNING & PERFORMANCE APPRAISAL

**Course:** BE-MBA Xth Semester

**Paper:** Elective-HR

**Paper Code:** IBM-1009  
**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:** Manpower planning and performance appraisal are critical aspects of future planning as far as employees are concerned. This subject deals with this important aspect.

Internal Assessment: 50  
External Assessment: 100

**Part-A**

**Manpower planning**: setting up objectives, aligning manpower planning with strategic business goals, Role analysis, job analysis, job specification., job description (9)

**Recruitment and selection**: recruitment and legislation, fair employment practices, recruitment, hiring procedure, forecasting human resource requirements, managing growth and replacement of top executives (12)

**Part-B**

**Performance appraisal**: need for performance appraisal, parameters of performance appraisal, computerized performance appraisal systems, self appraisal questionnaire, 360 degree performance appraisal systems (12)

References:


Paper Title: SEMINAR

Course: BE-MBA Xth Semester

Paper: Compulsory

Paper Code: IBM-1010

Course Duration: 45 hours

Internal Assessment: 100 marks

The students are required to prepare and deliver a presentation to the class on a given topic. The topic will be related to current business scenario / specialization area.

Presentation - 30 minutes

Question Hour session - 10 minutes

The student will be evaluated on the basis of Presentation content, Communication ability and handling question.
The students are required to prepare a minor project on the topic allotted to them. The topic will be allotted by consultation with the student in the area of specialization.

The student is required to submit the report in the following format:

a) Problem statement
b) Literature review
c) How to solve the problem
d) Research methodology
e) Data sources identified
f) Data collection
g) Statistical analysis
h) Results
i) Shortcomings