B.E. MBA Integrated

IN

COMPUTER SCIENCE AND ENGINEERING

OFFERED BY

PANJAB UNIVERSITY, CHANDIGARH
(Examination 2010-11)
### Scheme of Examination of B.E. MBA integrated in Computer Science & Engineering (2010-11)

#### Second Year - Third Semester B.E. MBA (CSE)

<table>
<thead>
<tr>
<th>Ref. No</th>
<th>Subject</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>Total</th>
<th>Sess.</th>
<th>Paper / Viva</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE301</td>
<td>Data Structures</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE351</td>
<td>Data Structures (Practical)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>75</td>
<td>75</td>
<td>150</td>
</tr>
<tr>
<td>CSE302</td>
<td>Computer Architecture &amp; Organization</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE303</td>
<td>Peripheral Devices &amp; Interfaces</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE353</td>
<td>Hardware Lab (Practical)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>75</td>
<td>75</td>
<td>150</td>
</tr>
<tr>
<td>IBM301</td>
<td>Organization Behavior</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>EC306</td>
<td>Electronics</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>EC356</td>
<td>Electronics (Practical)</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>MEC371</td>
<td>Work Shop Training (After Second Semester)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td>--</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>18</td>
<td>02</td>
<td>08</td>
<td>28</td>
<td>500</td>
<td>700</td>
<td>1200</td>
</tr>
</tbody>
</table>

#### Second Year - Fourth Semester B.E. MBA (CSE)

<table>
<thead>
<tr>
<th>Ref. No</th>
<th>Subject</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>Total</th>
<th>Sess.</th>
<th>Paper / Viva</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE401</td>
<td>Analysis &amp; Design of Algorithms</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE451</td>
<td>Analysis &amp; Design of Algorithms (Practical)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>75</td>
<td>75</td>
<td>150</td>
</tr>
<tr>
<td>CSE402</td>
<td>Database Management System</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE452</td>
<td>Database Management System (Practical)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>75</td>
<td>75</td>
<td>150</td>
</tr>
<tr>
<td>CSE404</td>
<td>Object Oriented Programming</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE454</td>
<td>Object Oriented Programming (Practical)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>75</td>
<td>75</td>
<td>150</td>
</tr>
<tr>
<td>IBM401</td>
<td>Management of Information Technology</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>EC406</td>
<td>Microprocessors</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>EC456</td>
<td>Microprocessors (Practical)</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>15</td>
<td>04</td>
<td>11</td>
<td>30</td>
<td>525</td>
<td>775</td>
<td>1300</td>
</tr>
</tbody>
</table>
## Third Year - Fifth Semester B.E. MBA (CSE)

<table>
<thead>
<tr>
<th>Ref. No</th>
<th>Subject</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>Total</th>
<th>Sess.</th>
<th>Paper / Viva</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE501</td>
<td>Operating System</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE551</td>
<td>Operating System (Practical)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>75</td>
<td>75</td>
<td>150</td>
</tr>
<tr>
<td>CSE502</td>
<td>Software Engineering</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE552</td>
<td>Software Engineering (Practical)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>75</td>
<td>75</td>
<td>150</td>
</tr>
<tr>
<td>CSE503</td>
<td>Computer Network</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE553</td>
<td>Computer Network (Practical)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>75</td>
<td>75</td>
<td>150</td>
</tr>
<tr>
<td>CSE504</td>
<td>Principle of Programming Languages</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>IBM 501</td>
<td>Marketing Management</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>IBM 502</td>
<td>Human Resource Management</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE506</td>
<td>Industrial Training (After 4th Sem)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td>--</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>18</strong></td>
<td><strong>4</strong></td>
<td><strong>9</strong></td>
<td><strong>31</strong></td>
<td><strong>575</strong></td>
<td><strong>825</strong></td>
<td><strong>1400</strong></td>
</tr>
</tbody>
</table>

## Third Year - Sixth Semester B.E. MBA (CSE)

<table>
<thead>
<tr>
<th>Ref. No</th>
<th>Subject</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>Total</th>
<th>Sess.</th>
<th>Paper / Viva</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE601</td>
<td>Web Technologies</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE651</td>
<td>Web Technologies (Practical)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>75</td>
<td>75</td>
<td>150</td>
</tr>
<tr>
<td>IBM 601</td>
<td>Managerial Economics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE603</td>
<td>Computer Graphics</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE653</td>
<td>Computer Graphics (Practical)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>75</td>
<td>75</td>
<td>150</td>
</tr>
<tr>
<td>CSE604</td>
<td>Artificial Intelligence</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE654</td>
<td>Artificial Intelligence (Practical)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSE605</td>
<td>Modeling &amp; Simulation</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>CSE655</td>
<td>Modeling &amp; Simulation (Practical)</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>IBM 602</td>
<td>Corporate Legal Environment</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>18</strong></td>
<td><strong>4</strong></td>
<td><strong>10</strong></td>
<td><strong>32</strong></td>
<td><strong>550</strong></td>
<td><strong>850</strong></td>
<td><strong>1400</strong></td>
</tr>
</tbody>
</table>
SYLLABUS FOR
B.E. MBA integrated in Computer Science & Engineering (2010-11)

THIRD SEMESTER

Paper Title: DATA STRUCTURES

Paper Code: CSE301  
Max. Marks (Final Exam): 100  
Max. Marks (Sessional Exam): 50  
Time: 3 Hours  
Total Lectures: 45

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

Objectives: This course should provide the students with a fairly good concept of the fundamentals of different types of data structures and also the ways to implement them. Algorithm for solving problems like sorting, searching, insertion & deletion of data etc. related to data structures should also be discussed. After completion of this subject student should be able to choose a appropriate data structure for a particular problem.

SECTION – A

Linear Data Structures:
Sequential representations – Arrays (one, two, multi dimensional) and Records, Binary Search, Stacks, Queues and Circular queues; Link Representation - Linear linked lists, circularly linked lists. Doubly linked lists, Garbage collection and Compaction. (12)

Recursion:
Design of recursive algorithms, Tail Recursion, When not to use recursion, Removal of recursion. (03)

Sorting Algorithms:
Bubble sort, Selection Sort, Insertion Sort, Quick Sort, Merge Sort, Heap sort and Radix Sort. (07)

SECTION – B

Non-linear Data Structure:

Hashing:
Hashing Functions, collision Resolution Techniques. (02)

File Structures:
Index Techniques: Hashed Indexing, Tree Indexing – B Trees; File Organizations: Sequential, Random, Linked Organizations, Inverted Files. (06)

Text Books:

References:
Paper Title: DATA STRUCTURES (Practical)

Paper Code: CSE351  Max. Marks: 50

Note: At least ten practical should be covered based on the following directions:

Implementation of array operations: Traversal, Insertion & Deletion at and from a given location

Stacks: Implementation of Push, Pop; Conversion of Infix expression to Postfix, Evaluation of Postfix expressions.

Queues: Circular Queue: Adding & deleting elements.

Linked list: inserting, deleting, implementation of stacks & queues using linked lists; Polynomial addition.


Implementation of Graphs

Implementation of sorting and searching algorithms

Hash tables implementation: searching, inserting and deleting

Paper Title: COMPUTER ARCHITECTURE AND ORGANIZATION

Paper Code: CSE302

Max. Marks (Final Exam): 100  Time: 3 Hours
Max. Marks (Sessional Exam): 50  Total Lectures: 45

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

Objectives: This course offers a good understanding of the various functional units of a computer system and prepares the student to be in a position to design a basic computer system.

SECTION – A

Register Transfer Language and Micro-Operations:
Basic Concepts, Complements, Fixed and Floating Point Representation, Register Transfer Language, Inter Register Transfer Arithmetic, Bus and Memory Transfers, Arithmetic, Logic and Shift Micro-Operations, Arithmetic Logic Shift Unit. (06)

Basic Computer Origination and Design:
Instruction Codes, Computer Instructions, Timing and Control, Execution of Instructions, Input Output and Interrupt, Design of Basic Computer. (06)

Programming the Basic Computer:

Central Processing Unit:
General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control. (06)

SECTION – B

Microprogrammed Control and Pipelining:
Control Memory, Address Sequencing, Microinstruction Formats, Pipelining, Arithmetic and Instruction Pipelining. (06)
**Computer Arithmetic:**
Addition and Subtraction of unsigned Binary Numbers, Addition, Subtraction, Multiplication and Division Algorithm.  

**Input-Output Organization:**
Input-Output Interface, Asynchronous Data Transfer, DMA, Priority Interrupt, I/O Processor, Serial Communication.  

**Memory Organization:**
Memory Hierarchy, Associative Memory, Virtual Memory, Cache Memory, Memory Management Hardware.  

**Text Book:**

**References:**

**Paper Title: PERIPHERAL DEVICES & INTERFACES**

**Paper Code:** CSE303  
**Max. Marks (Final Exam):** 100  
**Max. Marks (Sessional Exam):** 50  
**Time:** 3 Hours  
**Total Lectures:** 45  

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

**Objectives:** The objective of this course is to provide knowledge about integrated circuit memories & the functional details of various peripheral devices.  

**SECTION – A**

**The Memory Element:**
RAM, Linear Select Memory Organization, Decoders, Dimensions of Memory access, connecting Memory chips to a computer bus, Static RAM, Dynamic RAM, ROM, Digital recording techniques.  

**System Resources:**
Interrupt, DMA Channel, I/O Port Addresses and resolving and resolving the conflict of resources. I/O buses- ISA, PCI, SCSI, EISA, Local bus, VESA Local bus, PCI bus, PCI Express, Accelerated graphics port bus.  

**SECTION – B**

**Video Hardware :**
Introduction to Multimedia Kit, Multimedia building blocks, Video display technologies, DVI Digital signals for CRT Monitor, LCD Panels, Video adapter types, Integrated Video/ Motherboard chipset, Video RAM, Video driver and multiple Monitor, Graphic accelerators, Advanced 3D Techniques.  

**Input/ Output Driver software aspects:**
Role of device driver, DOS and UNIX/ LINUX device drivers. Design & Integration of Peripheral devices to a computer system as a Case Study.  

**Text Book:**

**References:**

**Paper Title: HARDWARE LAB. (PRACTICAL)**

**Paper Code:** CSE353  
**Max. Marks:** 75

**Note:** Practical based on:

1. **Introduction to various hardware elements:**  
   Monitors, Printers, Keyboards, Mouse, Different memory elements.

2. **Different types of buses and their interfaces.**

3. **Assembly of PC**

4. **Introduction to Network elements:**  
   Routers, Bridges, hubs, Switches, hardware tools and management tools.

**Paper Title: Organization Behavior (Theory)**

**Paper Code:** IBM 301  
**Max. Marks:** 100  
**Time:** 3 Hours  
**Course Duration:** 45 Lectures of one hour each.

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

**Part A**

**Introduction to Organization Behavior**  
[10]  
Definition and meaning of OB, impact of other sciences (Anthropology, Sociology, Psychology) on OB, perception, self esteem, attitude & personality, meaning of culture, impact of technology on OB.

**Motivation, Learning & Leadership**  
[13]  
Meaning of Motivation, Content theories of motivation (Maslows Hierarchy of needs, Herzberg’s two factor theory), Process theories (Vroom’s Expectancy theory, Porter-Lawler Model), Motivation applied (Job design, job rotation, goal setting, MBO), various methods of motivating employees, Behavioral & Cognitive theories of learning, Leadership theories (Trait theory, Fiedler’s Contingency theory, Path –Goal leadership theory), Leadership styles (Blake & Mouton managerial grid, Hersey & Blanchard’s life cycle approach)

**Part B**

4
Group behavior: Group Dynamics, conflict, power & politics, Group behavior, types of groups, group decision making, conflict in organizations and reason, interpersonal conflict, inter group conflict, meaning of power, classification of power, politics in organizations

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

Recommended Books:

Paper Title: ELECTRONICS

<table>
<thead>
<tr>
<th>Paper Code: EC306</th>
<th>Max. Marks (Final Exam): 100</th>
<th>Time: 3 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Max. Marks (Sessional Exam): 50</td>
<td>Total Lectures: 45</td>
</tr>
</tbody>
</table>

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

Objectives:

SECTION – A

Introduction:

Number System and Code:
Decimal Binary, Hexadecimal, Octal's complement, 2's complement, addition and substraction, weighted binary codes, Error detecting codes, Error correcting codes, Alphanumeric codes

Counters & Shift Register:
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.

Data Converters:
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.

SECTION – B
Digital Logic Families:
Characteristics of digital circuits: Fan in, fan out, power dissipation, propagation delay, noise margin; Transistor-transistor Logic (TTL), TIL, 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 & Fait time of MOS & CMOS gates, Interfacing TIL & CMOS Circuits, Comparison of Characteristics of TTL, ECL, MOS &, CMOS logic circuits, Tristate Logic & its applications.

Semiconductor Memories & Programmable Logic:
RQM, PROM, EPROM, EEPROM; RAM: Static RAM, Typical Memory Celt, Memory Organization, Dynamic RAM cell, Reading “ Writing Operation in RAM, PLA, PAL “ FPGA

Text Books:


Paper Title: ELECTRONICS. (PRACTICAL)

Paper Code: EC356 Max. Marks: 50

Note: Do any Eight experiments

1. To study truth tables of AND, OR, NOR, NAND, NOT and XOR Gates.
2. To verify the truth tables of RS, of JK and T Flip Flops.
3. To fabricate and test the truth table ofhalf7full adder.
4. To design and implement a Modulo-N Counter.
5. To design and implement a Universal shift register
6. Design and fabrication of synchronous counter
7. Design fabrication of combinational circuits using Multiplexers
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. MBA integrated in Computer Science & Engineering (2010-11)

FOURTH SEMESTER

Paper Title: ANALYSIS & DESIGN OF ALGORITHMS

Paper Code: CSE401

Max. Marks (Final Exam): 100
Max. Marks (Sessional Exam): 50

Time: 3 Hours
Total Lectures: 45

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

Objectives: The subject will give an insight into performance analysis, measurements and optimization of the various algorithm development techniques. After completing this subject students will be able to choose one algorithm technique for any kind of problem.

SECTION – A

Introduction:
Role of Algorithms in Computing; Growth of functions: Asymptotic Notation, Standard notation & common functions; Introduction to Recurrences: substitution method, recursion-tree method, master method; Randomizing Algorithms;

Divide and Conquer:
Performance analysis of Binary Search, Merge sort, Quick sort, Selection sort;

Greedy Algorithms:
Elements of Greedy strategy, Activity Selection Problem, Knapsack problem, Single source Shortcut paths problem, Minimum Spanning tree problem and analysis of these problems.

SECTION – B

Dynamic Programming:
Elements of dynamic programming, Assembly-line scheduling problem, Matrix-chain multiplication, Multistage Graph, All Pairs Shortest paths, Longest common subsequence, 0/1 Knapsack.

Back Tracking:
General method, 8 queen's problem, Graph coloring, 0/1 Knapsack Problem

NP-Completeness:
Polynomial Time, polynomial-time verification, NP-completeness & reducibility, NP-complete problems

Text Book:

References:
Paper Title: ANALYSIS & DESIGN OF ALGORITHMS (PRACTICAL)

**Paper Code:** CSE451  
**Max. Marks:** 75

*Note:* Practical based on theory paper to solve problems using following methods:

1. Divide & Conquer
2. Greedy Method
3. Dynamic Programming
4. Backtracking

---

Paper Title: DATABASE MANAGEMENT SYSTEMS

**Paper Code:** CSE402  
**Max. Marks (Final Exam):** 100  
**Max. Marks (Sessional Exam):** 50  
**Time:** 3 Hours  
**Total Lectures:** 45

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

**Objectives:** This course offers a good understanding of database systems concepts and prepares the student to be in a position to use and design databases for different applications.

**SECTION – A**

**Introduction to Database Systems:**

(06)

**Physical Data Organization:**
File Organization and Indexing, Index Data Structures, Hashing, B-trees, Clustered Index, Sparse Index, Dense Index, Fixed length and Variable Length Records.

(06)

**Data Models:**
Relational Model, Network Model, Hierarchical Model, ER Model: Entities, Attributes and Entity Sets, Relationships and Relationship Sets, Constraints, Weak Entities, Class Hierarchies, Aggregation, Conceptual Database Design with the ER Model, Comparison of Models.

(05)

**The Relational Model:**
Introduction to the Relational Model, ER to Relational Model Conversion, Integrity Constraints over Relations, Enforcing Integrity Constraints, Relational Algebra, Relational Calculus, Querying Relational Data.

(05)

**SECTION – B**

**Relational Query Languages:**
SQL: Basic SQL Query, Creating Table and Views, SQL as DML, DDL and DCL, SQL Algebraic Operations, Nested Queries, Aggregate Operations, Cursors, Dynamic SQL, Integrity Constraints in SQL, Triggers and Active Database, Relational Completeness, Basic Query Optimization Strategies, Algebraic Manipulation and Equivalences.

(07)
Database Design:
Functional Dependencies, Reasoning about Functional Dependencies, Normal Forms, Schema Refinement, First, Second and Third Normal Forms, BCNF, Multi-valued Dependency, Join Dependency, Fourth and Fifth Normal Forms, Domain Key Normal Forms, Decompositions.

Transaction Management:
ACID Properties, Serializability, Two-phase Commit Protocol, Concurrency Control, Lock Management, Lost Update Problem, Inconsistent Read Problem, Read-Write Locks, Deadlocks Handling, 2PL protocol.

Database Protection:
Threats, Access Control Mechanisms, Discretionary Access Control, Grant and Revoke, Mandatory Access Control, Bell LaPadula Model, Role Based Security, Firewalls, Encryption and Digital Signatures.

Text Book:

References:

Paper Title: DATABASE MANAGEMENT SYSTEMS (PRACTICAL)

Paper Code: CSE452 Max. Marks: 75

Note: This practical will enable students to retrieve data from relational databases using SQL. Students will also learn about triggers, cursors, stored procedures etc.

1. Introduction to SQL and installation of SQL Server / Oracle.
2. Data Types, Creating Tables, Retrieval of Rows using Select Statement, Conditional Retrieval of Rows, Alter and Drop Statements.
3. Working with Null Values, Matching a Pattern from a Table, Ordering the Result of a Query, Aggregate Functions, Grouping the Result of a Query, Update and Delete Statements.
7. Stored Procedures and Exception Handling.
8. Triggers and Cursor Management in PL/SQL.

Paper Title: OBJECT ORIENTED PROGRAMMING
Objectives: To understand the basic concepts of object oriented programming languages and to learn the techniques of software development in C++.

SECTION – A
1. Principles of Object Oriented Programming
2. Tokens, Expressions and control structures, various data types, and data structures, Variable declaration, Operators and scope of operators.
3. Pointers, Functions, Classes and Objects: Prototyping, referencing the variables in functions, memory allocation for classes and objects, Array of objects, pointers to member functions.
4. Constructors and Destructors, Operator Overloading and type conversion.
5. Inheritance: Derived classes, types of inheritance, and various types of classes.

SECTION – B
6. Virtual functions and Polymorphism.
8. Exception Handling and Generic programming with templates: Introduction to templates, overloading of template functions and Inheritance.

Text Book:

References:

Paper Title: OBJECT ORIENTED PROGRAMMING & C++ (PRACTICAL)

Note: Programs related to:
1. 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: Management of Information Technology (Theory)

Note: Programs related to:
Course Duration: 45 Lectures of one hour each.

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

Part A

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

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

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

Part B

E-Commerce & E-Governance [12]
E-Commerce models, Intermediaries in E-Commerce, E-Governance in India, study of successful E-Governance models like E-Choupal, E-Payments (E-Cash, E-Wallets) and major players in the area, Online Shopping, Revenue models for Online Shopping Portals, Web Auctions like eBay, dealing with E-Waste.

Knowledge Management & Business Intelligence [10]
Meaning of Knowledge Management, Designing a Knowledge Management System, Nature & Scope of Business Intelligence, Software for Business Intelligence, Data Warehousing and Data Mining techniques.

Recommended Books:

Paper Title: MICROPROCESSOR

Max. Marks (Final Exam): 100
Max. Marks (Sessional Exam): 50

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: Provide students with the opportunity to gain experience in microprocessor-based system design, assembly language programming, and I/O interfacing to microprocessors.

SECTION – A
Microprocessor Architecture and Microcomputer Systems:
Microprocessor Architecture Memory, Input and Output Devices, The 8085 MPU, Example of an 808S-Based Microcomputer, Memory Interfacing, The SDK-85 Memory System.

Interfacing I/O Devices:

Programming the 8085:
Introduction to 8085 Assembly Language Programming, The 8085 Programming Model, Instruction Classification, Instruction format, Data Transfer (Copy) Operations, Arithmetic Operations, Logic Operations Branch Operations, Writing Assembly Language Programs.

Programming Techniques with Additional Instructions:

SECTION – 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.

Interfacing Data Converters:

General -Purpose Programmable Peripheral Devices:
The 8255A Programmable Peripheral Interface, Illustration: Interfacing Keyboard and Seven- Segment Display, Illustration: Bi-directional-Data Transfer between Two Microcomputers, The 8254 Programmable Interval Timer, The 8259 A Programmable Interrupt Controller, Direct Memory, Access (DMA) and the 8257 DMA Controller, serial communication, Programmable communications interface 8251.

Text Book:
1. Ramesh S. Gaonkar : Microprocessor Programming and Architecture, Applications with the 8085, Fifth edition, Penram International

References:

Paper Title: MICROPROCESSOR (PRACTICAL)

Max. Marks: 75

Paper Code: EC 456

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.
SYLLABUS FOR
B.E. MBA integrated in Computer Science & Engineering (2010-11)
FIFTH SEMESTER

Paper Title: OPERATING SYSTEM

Paper Code: CSE501

Max. Marks (Final Exam): 100
Max. Marks (Sessional Exam): 50

Time: 3 Hours
Total Lectures: 45

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: This course should provide the students with good understanding of Operating System including its architecture and all its components. Good conceptions on all the subjects like processes, inter-process communication, semaphore, message passing, classical IPC problems, scheduling, memory management, file systems, security and protection mechanism, I/O hardware and software, deadlocks, etc. should be provided.

SECTION – A
Introduction: What is an O.S., O.S. Functions; Different types of O.S.: batch, multi-programmed, time sharing, real time, distributed, parallel; General structure of operating system, O/S services, system calls. (6)

Process Management: Introduction to processes - Concept of processes, process scheduling, operations on processes; Inter Process Communication, Critical Sections, Mutual Exclusion with Busy Waiting, Sleep and Wakeup, Semaphores, Message passing; CPU scheduling- scheduling criteria, preemptive & non-preemptive scheduling, Scheduling Algorithms: FCFS, SJF, RR and priority. 10

Memory Management: background, logical vs. physical address space, memory management without swapping; swapping; contiguous memory allocation, paging, segmentation, segmentation with paging; Virtual Memory, demand paging, performance, page replacement, page replacement algorithms (FIFO, Optimal ,LRU); Thrashing. (6)

SECTION – B
File Systems: Files - file concept, file structure, file types, access methods, File attributes, file operations; directory structure, allocation methods (contiguous, linked, indexed), free-space management (bit vector, linked list, grouping), Protection mechanisms. (6)

Secondary Storage: Disk Structure, Disk Scheduling (FCFS, SSTF, SCAN, C-SCAN, LOOK), Disk Management (Disk Formatting, Boot Blocks, Bad Blocks), Swap Space Management (Swap Space use, Swap Space Location, Swap Space Management) (6)


Case Studies: Brief introduction of MS-DOS, Windows, UNIX and LINUX. (5)

Text Book:

References:
Paper Title: OPERATING SYSTEM LAB (PRACTICAL)

Paper Code: CSE551

Note: Practical Problems related to

1. Learning Basic Features and Operating Environment of UNIX and LINUX.
2. Introduction to Shell and Shell Commands.
3. Shell programming: creating a script, making a script executable, shell syntax (variables, conditions, control structures, functions, commands).
4. Process: starting new process, replacing a process image, duplicating a process image, waiting for a process.
5. Programming with semaphores.

Paper Title: SOFTWARE ENGINEERING

Paper Code: CSE502

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

Objectives: This course aims to give students a theoretical foundation in software engineering. Students will learn about the principles and methods of software engineering, including current and emerging software engineering practices and support tools.

SECTION – A

Introduction:

Software Process Models:

Project Management Concepts:

Software Requirements Analysis and Specification Concepts:

Software Design and Coding Concepts:
SECTION – B

Testing:

Software Quality Assurance:
Software Quality, Software Quality Factors, Quality Assurance and Standards, Quality Planning, Quality Control, ISO 9000 Certification for Software Industry, SEI Capability Maturity Model and Comparison between ISO & SEI CMM. Introduction to Six Sigma, SPICE. (05)

Technical Metrics for Software:

CASE (Computer Aided Software Engineering) and Introduction to UML:

Text Book:

References:

Paper Title: SOFTWARE ENGINEERING (PRACTICAL)

Paper Code: CSE552 Max. Marks: 75

Note: This practical will enable students manage software projects using MS-Project. Students will learn about preparing analysis and design models using UML modeling concepts through Rational Rose. Students will also be exposed to CASE tools.

1. Study the features of MS-Project.
2. Use MS-Project to draft project plan for a particular project case study.
3. Use MS-Project to generate various reports like Gantt chart, Network diagram, Resource usage sheet.
4. Use MS-Project to track the progress of a project.
5. Study the concepts of UML modeling.
6. Use Rational Rose to generate use case diagrams.
7. Use Rational Rose to generate sequence diagrams.
8. Use Rational Rose to generate class diagrams.
9. Use Rational Rose to generate collaboration diagrams.
10. Study the features of a particular CASE tool for requirements specification, analysis, design and cost estimation.
11. Apply each of the above tools to a particular case study.

**Paper Title: COMPUTER NETWORK**

**Paper Code:** CSE503

<table>
<thead>
<tr>
<th>Max. Marks (Final Exam): 100</th>
<th>Time: 3 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Marks (Sessional Exam): 50</td>
<td>Total Lectures: 45</td>
</tr>
</tbody>
</table>

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

**Objectives:** This course aims to give students a theoretical foundation in software engineering. Students will learn about the principles and methods of software engineering, including current and emerging software engineering practices and support tools.

**SECTION – A**

**Introduction:**
Data Communication: Components, Data Flow;
Network Categories: LAN, MAN, WAN (Wireless / Wired);
Network Software: Concept of layers, protocols, interfaces and services;
Reference Model: OSI, TCP/IP and their comparison; 

(06)

**Physical Layer:**
Concept of Analog & Digital Signal; Bit rate, Bit Length; Transmission Impairments: Attenuation, Distortion, Noise;
Data rate limits: Nyquist formula, Shannon Formula;
Multiplexing: Frequency Division, Time Division, Wavelength Division;
Transmission media: Twisted pair, coaxial cable, fiber optics, wireless transmission (radio, microwave, infrared);
Circuit Switching & Packet Switching..

(08)

**Data Link Layer:**
Error correction & Detection; Flow & Error Control;
Sliding window protocols: Stop & Wait ARQ, Go back n ARQ, Selective repeat ARQ; Examples of DLL Protocols-HDLC, PPP;
Medium Access Sub layer: Channel Allocation; Random Access: ALOHA, CSMA protocols; Controlled Access: Polling, Reservation, Token Passing;
Examples of IEEE 802.3, 802.11 standards;

(10)

**SECTION – B**

**Network Layer:**
Logical Addressing: IPv4 and IPv6; Packet Formats & their comparison: IPv4 and IPv6;
Routing algorithms: Distance vector, Link State Routing, Hierarchical Routing, Broadcast & Multicast Routing;
Congestion Control: Principles of Congestion Control, Congestion prevention policies, Leaky bucket & Token bucket algorithms

(10)

**Transport Layer:**
Addressing, flow control & buffering, multiplexing & de-multiplexing, crash recovery;
Example transport protocols: TCP, SCTP and UDP;

(08)

**Application Layer:**
Network Security; Domain Name System; Simple Network Management Protocol; Electronic Mail;

(03)

**Text Book:**
   “Data Communication & Networking”, 4th edition,  

References:  

Paper Title: COMPUTER NETWORK (Practical)  
Paper Code: CSE553  
MM (External):75  
MM (Internal): 75  

Note: Practical Problems related to:  
1. To familiarize with the various basic tools (crimping, krone etc.) used in establishing a LAN.  
2. To study various topologies for establishing computer networks.  
3. To familiarize with switch, hub, connectors, cables (cabling standards) used in networks  
4. To familiarize with routers & bridges  
5. To use some basic commands like ping, trace-root, ipconfig for trouble shooting network related problems.  
6. To use various utilities for logging in to remote computer and to transfer files from/to remote computer.  
7. To develop a program to compute the Hamming Distance between any two code words.  
8. To develop a program to compute checksum for an ‘m’ bit frame using a generator polynomial.  
9. To develop a program for implementing/simulating the sliding window protocol  
10. To develop a program for implementing/simulating a routing algorithm  
11. To study various IEEE standards (802.3, 802.11, 802.16)  

Paper Title: PRINCIPLES OF PROGRAMMING LANGUAGES  
Paper Code: CSE504  
Max. Marks (Final Exam): 100  
Max. Marks (Sessional Exam): 50  
Time: 3 Hours  
Total Lectures: 45  

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: This course should provide the students with a fairly good concept of fundamental concepts and design issues of programming languages and become familiar with major programming paradigms. Understand similarities and differences between models and know when to use them and also learn programming techniques appropriate for each model.  

SECTION – A  

Introduction:
Study of principles and major concepts in various programming paradigms like imperative, functional, object-oriented and logic programming. Introduction to various phases of compilers, Formal translation models: BNF Grammars.

**Imperative programming:**
Location, reference and expressions, assignment and control, data types, blocks, procedures and modules. 10
Object Oriented Programming: Classes and objects, abstraction and encapsulation, inheritance, Polymorphism, virtual functions and classes.

**Logic Programming:**
Unification, SLD-resolution, Backtracking, Cuts.
Concepts Of Concurrent Programming: Processes, synchronization primitives. 5

**SECTION – B**

**Functional Programming:**
Functions as first class objects, higher order functions, polymorphic datatypes, type checking and type inference

**Introduction to storage management:**
Static storage management, Heap storage management. 10

**Illustration of the above concepts using representative languages:** C++, Java, and Prolog etc. 5

**Text Book:**

**References:**

---

**Paper Title: Marketing Management**

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

Course Duration: 45 Lectures of one hour each.

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

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

**Part A**

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

**Marketing Environment:**
Marketing Environment; New Marketing Realities; New Consumer Capabilities; Demographic Environment; Social-Cultural Environment; Natural Environment; Technological Environment and Political-Legal Environment; SWOT analysis.

**Analyzing Markets:**
Marketing Research Process; Sources of data collection; factors influencing consumer behavior; buying decision process; post-purchase behavior; Organizational Buying; Stages in the Buying Process.

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

---

**Part B**

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

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

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

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

**References:**

**Paper Title:** Human Resource Management

**Paper Code:** IBM 502

**Max. Marks 100**

**Time: 3 Hours**

Course Duration: 45 Lectures of one hour each.

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

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

**Part A**

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

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

**Human Resource Planning:**
Definition, objectives, process and importance; Job analysis, description, specification & job evaluation; Recruitment, selection, placement and induction process;

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

**Part B**

**Job Compensation:**
Wage & salary administration, incentive plans & fringe benefits.

**Performance Management:**
Concept & process, performance appraisal, Potential appraisal;

**Quality of work life (QWL):**
Meaning, techniques for improving QWL.

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

**References:**
SYLLABUS FOR
B.E. MBA integrated in Computer Science & Engineering (2010-11)

SIXTH SEMESTER

Paper Title: WEB TECHNOLOGIES

**Paper Code:** CSE601  
**L T P:** 3 1 0  
**Max. Marks (Final Exam):** 100  
**Time: 3 Hours**

**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.

**Objective:** Aim of this paper is to familiarize the students with current technologies used in Web development and maintenance.

**SECTION – A**

**INTERNET AND WORLD WIDE WEB:**
Introduction, Internet Addressing, ISP, types of Internet Connections, Introduction to WWW, WEB Browsers, WEB Servers, URLS, http, WEB applications, Tools for WEB site creation. (4)

**HTML:**
Introduction to HTML, Lists, adding graphics to HTML page, creating tables, linking documents, frames, DHTML and Style sheets. (6)

**Java Script:**
Introduction, programming constructs: variables, operators and expressions, conditional checking, functions and dialog boxes, JavaScript DOM, creating forms, introduction to Cookies (11)

**SECTION – B**

**JAVA:**
Introduction to java objects and classes, control statements, arrays, inheritance, polymorphism, Exception handling. (6)

**XML:**
Why XML, XML syntax rules, XML elements, XML attributes, XML DTD displaying XML with CSS. (6)

**AJAX**
Introduction, HTTP request, XMLHttpRequest, AJAX Server Script, AJAX Database. (6)

**PHP**
Introduction, syntax, statements, operators, sessions, E-mail, PHP and MySQL, PHP and AJAX. (6)

**Text Books:**

**References:**
Paper Title: WEB TECHNOLOGIES (Practical)

*Paper Code:* CSE651

*Note:* Students have to perform following experiments related to

1. Creation of Web pages using: HTML, DHTML
2. Creation of Web pages using JavaScript
3. Implementing basic concepts of Java
4. Creation of Web pages using AJAX
5. Database and AJAX
6. XML
7. PHP

Paper Title: Managerial Economics

*Paper Code:* IBM 601

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

**Part A**

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

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

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

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

Part B

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

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

Revenue Curves:  [4]
Concept and Types.

Perfect Competition:  [4]
Characteristics, Equilibrium Price, Profit Maximizing output in Short Run and Long Run;

Monopoly:  [4]
Characteristics, Equilibrium Price, Profit Maximizing output in Short Run and Long Run; Price Discrimination;

Imperfect Competition:  [4]
Monopolistic Competition, oligopoly and Barriers to Entry.

References:
3. Dr. V.Panduranga Rao: Microeconomics, 8th Edition, IBS Publication
8. Mote, Paul Gupta: Managerial Economics, 1st Edition(45th Reprint), Vikas Publisher, New Delhi

Paper Title: COMPUTER GRAPHICS

Paper Code: CSE603  Max. Marks (Final Exam): 100  Time: 3 Hours
Max. Marks (Sessional Exam): 50  Total Lectures: 45

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

Objectives: This course offers a good understanding of computer graphics concepts and prepares the student to be in a position to understand and draw graphics for different applications.

SECTION – A
Overview of Graphics Systems:
Video Display Devices, Direct View Storage Tubes, Flat Panel Displays: Emissive and Non-Emissive Displays; Plasma Panel, Thin Film Electroluminescent and Liquid Crystal Displays, Color Display Techniques: Shadow Mask and Beam-penetration Methods, Three Dimensional Viewing Devices, Raster Scan Systems, Display Processor, Random Scan Systems, Co-ordinate Representations, Screen Coordinates.

Output Primitives:

Two Dimensional Geometric Transformations and Viewing:
Basic Transformations: Translation, Rotation and Scaling, Matrix Representations, Composite Transformations, Viewing Pipeline, Window to Viewport Coordinate Transformation, Clipping Operations: Line, Polygon, Curve and Text Clipping.

SECTION – B

Three Dimensional Concepts, Transformations and Viewing:
Three Dimensional Display Methods, Three Dimensional Transformations; Three Dimensional Viewing Pipeline; Viewing Coordinates; Specifying the View Plane, Projections: Parallel Projections, Perspective Projections.

Splines and Curves:
Curved Lines and Surfaces, Spline Representations, Cubic Splines, Bezier Curves and their properties, B-Spline Curves.

Visible Surface Detection Methods:
Classification of Visible Surface Detection Methods, Back Face Detection, Depth Buffer, A-Buffer, Scan Line and Depth-Sorting Methods, Wireframe Methods, Concepts of Computer Animation, Design of Animation Sequences.

Text Book:

References:

Paper Title: COMPUTER GRAPHICS (Practical)

Paper Code: CSE653
Max. Marks: 75

Note: This practical will enable students to draw basic graphics objects, perform transformations and build graphics applications in C.

1. Introduction to graphics programming in C/C++.
2. Initializing graphics system. Basic graphics functions.
3. Drawing lines, circles, ellipses and other common objects.
4. Boundary Fill, Flood Fill and other region filling algorithms.
5. Two dimensional transformations (Translation, Rotation, Scaling, Reflection, Shear) on different objects.
6. Clipping algorithms.
7. Programs related to splines and curves, animation sequences.

**Paper Title: ARTIFICIAL INTELLIGENCE**

*Paper Code:* CSE604

Max. Marks (Final Exam): 100
Max. Marks (Sessional Exam): 50

Time: 3 Hours
Total Lectures: 45

**Objectives:** To introduce the AI techniques to solve problems and search strategies to find optimal solution paths from start to goal state. The course also introduces different knowledge representation methods with introduction to natural language processing and expert systems.

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.

**SECTION – A**

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

(6)

**Problem solving techniques:**
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

(9)

**Knowledge representation:**
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.

(8)

**SECTION – B**

**Planning:**
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

(6)

**Learning :**
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

(10)

**Introduction to Natural Language processing and Expert system:**

(6)

Text Book:

References:

Paper Title: ARTIFICIAL INTELLIGENCE (Practical)

Paper Code: 654

Note: Practical Problems related to

1. Program Related to Problem Solving techniques of AI
   - Breadth First Search
   - Depth First Search
   - Heuristic Search
   - Best Search
   - Min-Max Search with alpha-beta pruning
   - Tic-Tac-Toe problem
   - N-Queens and N-Knight problem
   - Unification Algorithm

2. Introduction To AI Languages such as LISP, PROLOG

3. Representing Knowledge using RuleML

4. Using semantic Web

5. Knowledge of using Neural Networks, Fuzz logic, genetic algorithms

6. Other new AI Techniques

Paper Title: MODELING AND SIMULATION

Paper Code: CSE605

Max. Marks (Final Exam): 100
Max. Marks (Sessional Exam): 50
Time: 3 Hours
Total Lectures: 45

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: This course should provide the students with good understanding of various techniques of Simulation.
SECTION – 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 queueing system, introduction to arrival and departure time, flowcharts for arrival and departure routine. Event graphs of queueing model. Determining the events and variables, Event graphs for inventory model. (10)

SECTION – 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:

Paper Title: MODELING AND SIMULATION (Practical )

Paper Code: CSE655 MM (External):50
MM (Internal): 50

Note: Practical Problems related to

1. Programming in MATLAB: Introduction, Branching statements, loops, functions, additional data types, plots, arrays, inputs/outputs etc.
2. Introduction regarding usage of any Network Simulator.
Objective: Corporate legal environment represents that external environment in which the organization has to work. The course covers the basic laws which a student must be aware of.

Part A

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

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

Part B


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

References: