

ACHARYA NAGARJUNA UNIVERSITY

**3 year P.G. Degree Course
(Semester System)**

MASTER OF COMPUTER APPLICATIONS

SYLLABUS

W.E.F. 2009 – 2010

R.V.R. & J.C. COLLEGE OF ENGINEERING
(Sponsored By Nagarjuna Educational Society)
CHOWDAVARAM – GUNTUR-19

ACHARYA NAGARJUNA UNIVERSITY

RULES AND REGULATIONS OF SEMESTER SYSTEM IN POST-GRADUATE DEGREE COURSES EFFECTIVE FROM THE ACADEMIC YEAR 2009-2010 ONWARDS.

1. ADMISSION :

Candidates shall be admitted into P.G.Degree Courses strictly in accordance with the rank secured at the entrance test, if any, or rank determined on the basis of the marks other criteria determined by the University from time to time, following the rules of reservation of seats for various categories of students.

2. DURATION AND COURSE OF STUDY:

The duration of the P.G.Degree Course is of one/two/three academic years. Each academic year is divided into two semesters. The two semesters in the first academic year are referred to as Semester I and Semester II and the two semesters in the second academic year are referred to as Semester III and Semester IV. For three year course, the third academic year will have semester V and VI. Each semester shall comprise of 16 weeks of instruction.

3. TIME FOR THE COMPLETION OF THE COURSE :

The candidates have to complete three years of P.G.Course within 6years from the year of joining the course.

4. AWARD OF DEGREE:

The Post Graduates Degree in the concerned faculty will be conferred on a candidate who has pursued a regular course of study for one /two /three academic years as prescribed in the scheme of instruction and has passed all the examinations as prescribed in the scheme of examination.

5. ATTENDANCE:

5.1. Candidates shall put in attendance of not less than 75% in aggregate in the prescribed subjects in each semester including field work , practical, project work, seminars, extension work etc. Condonation of shortage of attendance may be granted by the Principal of the college to the candidate who have put in 60% and above (but less than 75%) attendance of Medical Grounds on production of medical Certificate from a registered Medical Practitioner and also on payment of prescribed condonation fees.

5.2. Participants in N.C.C/N.S.S. Special/N.I Camps or Inter-collegiate or Inter-University or Inter-State or National or International Matches or Debates, Youth festivals or Educational tours, if they form part of the curriculum, or such other Inter-University , Inter-College activities as absence . However , the total period of such absence shall not exceed four weeks in a semester.

5.3. Candidates who have put in less than 60% of attendance are not eligible for grant of condonation on shortage of attendance and also they are not eligible to appear in the University examination of that semester. Such candidates shall have to repeat the regular course of study of the corresponding semester in subsequent academic

year in order to become eligible to appear for the examination . The seats of candidates admitted for repetition of the semester be treated as extra seats over and above the sanctioned strength.

5.4. Attendance shall be reckoned from the date of commencement of instruction as per the academic calendar. However , in the case of candidates admitted later (but within the stipulated time) the attendance will be reckoned from the date of admission.

5.5. To enable students to know their attendance at the end of each month, the concerned Heads of Departments shall display cumulative attendance for information.

6. SCHEME OF INSTRUCTION AND EXAMINATION:

6.1. Instruction in various subjects shall be provided by the college as per the Scheme of instructions and syllabi prescribed.

6.2. At the end of each semester, University examinations shall be held as prescribed in the scheme of examination.

6.3. Each theory paper carries 100 marks of which 80 marks are earmarked for semester-end examination and 20 marks are earmarked for internal assessment to be awarded by the teacher concerned on the basis of two internal tests for 10 marks, 5 marks for participation in seminars and group discussions and 5 marks for attendance. Two internal tests are conducted and the performance of the best of two will be taken. However if a student fails to take the tests/seminar/group discussion, no supplementary internal tests/seminar/group discussion, will be conducted. No minimum qualifying marks is prescribed in case of internal assessments.

6.4. If any student fails to get marks in internal assessments or abstains for the internal assessments test, he/she has to get required marks in the semester –end examination for a pass.

6.5. There will be double valuation of theory papers of semester-end examination. In case of difference of above 20% of marks between the two valuations, it will be sent for a third valuation. In such cases the nearest two beneficial to the student will be taken for the purpose of declaring the results. There is no provision for revaluation /personal verification of answer scripts.

6.6. Candidates who have put in the necessary attendance in a semester shall be permitted to continue the subsequent semester, irrespective of whether they have appeared or not at the semester-end examination, provided they have registered in all papers for the semester-end examinations. Registration means obtaining a hall ticket for the said examination.

6.7. Practical examination in the even numbered semester (II,IV&VI) of Post-graduate courses may be conducted by external examiner appointed by the university from the panel of experts. The practical examinations in the remaining semesters

(I,III&V) may be conducted by the internal examiners drawn from the same department/college.

6.8. Under semester system there will be no supplementary examinations.

7. PASSING STANDARDS.

7.1. ARTS AND COMMERCE:

A candidate should secure a minimum of 40% of marks in each semester-end theory paper of the University Examination (i.e. 32 marks out of 80 marks) and a minimum of 40% of total marks (i.e. 40 marks out of 100 marks) for a pass. In the case of dissertation/project work/field work/seminar/any such other assignment, where there is no internal assessment mark a candidate has to secure 40% for a pass.

7.2. SCIENCE FACULTIES:

A candidate should secure a minimum of 50% of marks in each semester-end theory paper of University Examination/ Practical (i.e. 40 marks out of 80 marks) and an aggregate of 50% of marks of all the papers of the semester for a pass. Further, a candidate should secure a minimum of 50% marks in seminar/project work/field work/dissertation / any such other assignment for a pass. If a candidate fails to secure an aggregate of 50% marks for a pass in a paper of a semester he/she has to secure 50% marks in such individual paper/papers (Semester-end examination + internal marks put together) in the subsequent examination.

7.3. M.C.A Course:

A candidate should secure a minimum of 40% of marks in each semester-end theory paper of university examination/practical (i.e. 32 marks out of 80 marks) and a minimum of 40% of total marks of each theory paper/ practical (i.e. 40 marks out of 100 marks) and an aggregate of 50% marks of all the semesters for a pass. Further, a candidate should secure a minimum 50% marks in seminar /project work for a pass.

8. AWARD OF DIVISION:

Candidates who have passed all the examinations of the P.G.Degree course shall be awarded classes/ divisions in accordance with the total aggregate marks secured by them in all semester examinations taken together.

- | | |
|---------------------------------|--------------------------------------|
| 1. First Class with distinction | -- 70% and above. |
| 2. First Class | -- 60% and above but less than 70%. |
| 3. Second Class | -- 50% and above but less than 60%. |
| 4. Third Class | -- 40% and above but less than 50%.. |

First Class/ Second Class is awarded to a candidate as per the above classification, provided he/she completes the course within the three years from the year of joining the Two Year P.G. course and Four years from date of joining the three year P.G. course.

There is no third class in courses of Master of Laws, Master of Education, Science Faculties and M.C.A.

However, candidates who have passed the examinations in the first attempt along with the batch in which they are admitted will be eligible for the award of First Class with Distinction.

8.1. In case of one year P.G. Diploma course First Class/Second Class is awarded to a candidate who completes the course within two years from the year of joining the P.G. Diploma Course.

9. AWARD OF RANKS :

Only those candidates who appear and pass the examination in all the papers of each semester at first appearance are eligible for the award of ranks provided they have secured a minimum of Second Class.

10. AWARD OF GOLD MEDALS/PRIZES :

Only those candidates who appear and pass the examination in all the papers of each semester at first appearance are eligible for the award of Gold Medals and Prizes. The award of Gold Medals/Prizes is also subject to the other conditions prescribed for the respective Gold Medals/Prizes.

11. BETTERMENT EXAMINATION :

The candidates are eligible to improve their aggregate % of marks in each semester separately or in all the semesters put together, provided they have passed the whole examination but secured less than 60% on the aggregate. Candidates who seek improvement in the aggregate % of marks (in a semester or in all the semester put together) to 60% and above are eligible to betterment examinations even in individual papers in which they have already secured 60% or above. But, no candidate who has already secured 60% or more marks in the aggregate either in the normal course or through betterment examination shall be eligible to appear for betterment examinations. Regular study candidates can appear for betterment examinations for each semester along with subsequent examinations only after passing in all papers of preceding semester - end examination. They can also appear betterment examinations of any semester after passing the course, subject to other conditions prescribed. However, there is no provision for betterment of marks secured at internal tests.

Three chances are given for betterment examinations. For purpose of classification, only such examination, betterment or otherwise, which is completed within the period of three years from the date of joining Two year P.G. course and Four years from the date of joining Three year P.G. course shall be taken into account. After above prescribed period marks secured at the betterment examination shall not be taken into account for awarding a class. However, these marks will be added for improvement of the percentage of marks of the candidate. The candidates have to pay prescribed betterment fees for every appearance.

MCA SEMESTER SYSTEM FORM & COURSES

FIRST SEMSTER OF MCA

Sub Code	Name of the Subject	Int. Marks	Ext. Marks	Total Marks	Hours/ Week
MCA101	IT Fundamentals	20	80	100	4
MCA102	Programming with C	20	80	100	4
MCA103	Computer Organization	20	80	100	4
MCA104	Discrete Mathematical Structures	20	80	100	4
MCA105	Accountancy and Financial Management	20	80	100	4
MCA106	PC Software Lab	20	80	100	6
MCA107	C Programming Lab	20	80	100	6
MCA108	Seminar	50	--	50	3
TOTAL		190	560	750	35

SECOND SEMSTER OF MCA

Sub Code	Name of the Subject	Int. Marks	Ext. Marks	Total Marks	Hours/ Week
MCA201	Language Processors	20	80	100	4
MCA202	Data Base Management Systems	20	80	100	4
MCA203	Data Structures	20	80	100	4
MCA204	Operating System Principles	20	80	100	4
MCA205	Probability & Statistics	20	80	100	4
MCA206	Data Structures using C++ LAB	20	80	100	6
MCA207	DBMS LAB	20	80	100	6
MCA208	Communication Skills	50	--	50	3
TOTAL		190	560	750	35

THIRD SEMSTER OF MCA

Sub Code	Name of the Subject	Int. Marks	Ext. Marks	Total Marks	Hours/ Week
MCA 301	Object Oriented Programming through JAVA	20	80	100	4
MCA 302	Computer Networks	20	80	100	4
MCA 303	Operations Research	20	80	100	4
MCA 304	Computer Graphics	20	80	100	4
MCA 305	Artificial Intelligence	20	80	100	4
MCA 306	Java Programming Lab	20	80	100	6
MCA 307	Unix Shell Programming LAB	20	80	100	6
MCA 308	Seminar	50	--	50	3
TOTAL		190	560	750	35

FOURTH SEMSTER OF MCA

Sub Code	Name of the Subject	Int. Marks	Ext. Marks	Total Marks	Hours/ Week
MCA 401	Principles of Programming Languages	20	80	100	4
MCA 402	Object Oriented Modeling and Design Using UML	20	80	100	4
MCA 403	Web Technologies	20	80	100	4
MCA 404	Software Engineering	20	80	100	4
MCA 405.1 405.2 405.3	Grid and Cluster Computing Cryptography and Networks Security Simulation Modeling and Analysis	20	80	100	4
MCA 406	Web Technologies Lab	20	80	100	6
MCA 407	Visual Programming Lab	20	80	100	6
MCA 408	Soft skills	50	--	50	3
TOTAL		190	560	750	35

FIFTH SEMSTER OF MCA

Sub Code	Name of the Subject	Int. Marks	Ext. Marks	Total Marks	Hours/ Week
MCA 501	Data Ware Housing and Data Mining	20	80	100	4
MCA 502	.Net Programming	20	80	100	4
MCA 503	Design and Analysis of Algorithms	20	80	100	4
MCA 504.1 504.2 504.3	Embedded Systems Mobile Computing Software Testing Techniques	20	80	100	4
MCA 505.1 505.2 505.3	Image Processing Microprocessors and Interfacing Web Engineering	20	80	100	4
MCA 506	.Net Programming Lab	20	80	100	6
MCA 507	Advanced Java Lab	20	80	100	6
MCA 508	Seminar	50	--	50	3
TOTAL		190	560	750	35

SIXTH SEMSTER OF MCA

Sub Code	Name of the Subject	Int. Marks	Ext. Marks	Total Marks	Hours/ Week
MCA 601	Project Work	--	150	150	Five Months Duration

TOTAL MARKS FOR THE MCA COURSE : 3900

MCA 101: IT Fundamentals

Unit – I

Business and information technology

Business in the information age: Pressures and responses, why you need to know about Information Technology, what is an Information System?

Information technologies in the modern organization

Basic concepts of information systems organizations: Structure and IT support, IT support at different organizational levels, managing Information Technology in organizations, IT people and careers.

Unit –II

Computer hardware: The significance of hardware, the central processing unit, computer memory, computer hierarchy, input technologies, output technologies

Computer software: Software history and significance, system software, application software, software issues, programming languages, enterprise software

Managing organizational data and information: Basics of data arrangement and access, the traditional file environment, Databases – The modern approach, database management system, logical data models, data warehouses

Unit – III

Telecommunications and networks: The Telecommunications system, networks, network communication software, network processing strategies, Telecommunication applications

The Internet, Intranets and Extranets: What exactly is the Internet?, the evolution of the Internet, the operation of the Internet, services provided by the Internet, the World Wide Web, Internet Challenges, Intranets, Extranets, Enterprise information protocols, The Mobile Internet

Unit – IV

Functional, Enterprise, and Inter Organizational Systems: Information Systems to support business functions, transaction processing. Information systems, accounting and finance systems, marketing and sales systems, production and operations management systems, human resources management systems, integrated information systems and enterprise resource planning, inter organizational /global information systems

Electronic Commerce: Overview of E – commerce, business – to – consumer applications, market research, advertising, and consumer service, business – to – business collaborative commerce applications, innovative applications of E – commerce, infrastructure and E – commerce support service

Computer based supply chain management and information systems integration: Supply chain and their management, supply chain problems and solutions, IT supply chain support and systems integration

Data, Knowledge, and Decision support: Management and decision making, data transformation and management, decision support systems

Prescribed Book:

EFRAIM Turban, R. Kelly Rainer, Richard E. Potter, “**Introduction to Information Technology**”, John Wiley (2008), chapters 1 to 9, 10.1, 10.2, 10.3 and 11.1, 11.2, 11.3.

Reference Books:

1. ITL Education Solutions Ltd., “Introduction to Information Technology”, Pearson India (2008).
2. Deborah Morley, Charles S. Parker, “Understanding Computers Today and Tomorrow, 11th edition, Thomson (2007).
3. Aksoy, DeNardis, “Introduction to Information Technology”, Cengage Learning (2008).
4. Ajoy Kumar Ray, Tinku Acharya, “Information Technology”, PHI.

MCA 102: Programming with 'C'

Unit-I

Introductory Concepts: Types of Programming Languages, Introduction to C, Desirable Program Characteristics

Introduction to C Programming: The C Character Set, Writing First Program of C, Identifiers and Keywords, Datatypes, Constants, Variables and Arrays, Declarations, Expressions Statements, Symbolic Constants

Operators and Expressions: Arithmetic Operators, Unary Operators, Relational and Logical Operators, Assignment Operators, The Conditional Operator, Library Functions.

Data Input and Output: Preliminaries, Single Character Input-The Getchar Function, Single Character Output – The Putchar Function, Enter Input Data – The Scanf Function, More About the Scanf Function, Writing Output Data – The Printf Function, More About the Printf Function, The Gets and Puts Functions

Preparing and Running A Complete C Program: Planning a C Program, Writing a C Program, Error Diagnostics, Debugging Techniques

Unit-II

Control Statements: Preliminaries, Branching: The IF-ELSE Statement, Looping: The while Statement, More Looping: The do-while Statement, Still More Looping: The for Statement, Nested Control Structures, The Switch Statement, The break Statement, The continue Statement, The comma Statement, The goto Statement.

Functions: A Brief Overview, Defining a Function, Accessing a Function, Function Prototypes, Passing Arguments to a Function, Recursion

Program Structure: Storage Classes, Automatic Variables, External (Global) Variables, Static Variables.

Unit-III

Arrays: Defining an Array, Processing an Array, Passing Arrays to Functions, Multidimensional Arrays, Arrays and Strings

Pointers: Fundamentals, Pointer Declarations, Passing Pointers to a Function, Pointers and One-dimensional Arrays, Dynamic Memory Allocation, Operations on Pointers, Pointers and Multidimensional Arrays, Arrays of Pointers, Passing Functions to Other Functions

Structures and Unions: Defining a Structure, Processing a Structure, User-defined Data Types (Typedef), Structure and Pointers, Passing Structures to Functions, Self-referential Structures, Unions

Data Files: Why Files, Opening and Closing a Data File, Reading and Writing a Data File, Processing a Data File, Unformatted Data Files, Concept of Binary Files

Unit-IV

Low-Level Programming: Register Variables, Bitwise Operations, Bit Fields

Some Additional Features of C: Enumerations, Command Line Parameters, More About Library Functions, Macros, The C Processor

Appendix H Library Functions

Prescribed Book:

Byron S Gottfried, "Programming with C", Second Edition, Schaum Out Lines, TATA Mc Graw Hill (2007)

Chapters: 1.8 to 1.10, 2,3,4,5,6,7,8.1 to 8.4,9,
10.1 to 10.9,11,12,13,14 and Appendix H

Reference Book:

1. Behrouy A. Foreuyan & Richard F. Gilberg, "Computer Science A structured programming Approach using C", Third Edition, Cengage Learning (2008).
2. Herbert Schildt, "The Complete Reference C", Fourth Edition, TMH (2008)
3. Ashok N. Kamthane, "Programming with ANSI and Turbo C", Pearson Education (2008)
4. Mullish Cooper, "The Spirit of C – An Introduction to Moderen Programming", Jaico Books (2006)

MCA 103: Computer Organization

Unit-I

Digital Logic Circuits: Digital Computers, Logic Gates, Boolean Algebra, Map Simplification, Combinational Circuits, Flip-Flops, Sequential Circuits.

Digital Components: Integrated Circuits, Decoders, Multiplexers, Registers, Shift Registers, Binary Counters, Memory Unit.

Data Representation: Data Types, Complements, Fixed Point Representation, Floating Point Representation, Other Binary Codes, error Detection Codes.
(Chapters:)

Unit-II

Register Transfer and Microoperations: Register Transfer Languages, Register Transfer, Bus and Memory Transfer, Arithmetic Micro Operations, Logic Micro Operations, Shift Micro Operations, Arithmetic Logic Shift Unit

Basic Computer Organization and Design: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input-Output and Interrupt.
(Chapters:

Unit-III

Microprogrammed Control: Control Memory, Address Sequencing, Micro Program Example, Design of Control Unit.

Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Format, Addressing Modes, Data Transfer and Manipulation, Program Control.
(Chapters:

Unit-IV

Computer Arithmetic: Addition, Subtraction, Multiplication, Division Algorithms, Floating Point Arithmetic Operations.

Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt.

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary memory, Associative Memory, Cache Memory.
(Chapters:

Prescribed Book:

M.Morris Mano, "Computer System Architecture", 3rd Edition, Pearson Education (2008).

Chapters : 1,2,3, 4, 5.1 to 5.7, 7, 8.1 to 8.7, 10.2 to 10.5,
11.1 to 11.5, 12.1 to 12.5

Reference Books:

1. V. Rajaraman, T. Radha Krishnan, "Computer Organization and Architecture", PHI
2. Behrooz Parhami, "Computer Architecture", Oxford (2007)
3. ISRD group, "Computer Organization", ace series, TMH (2007)
4. William Stallings, "Computer Organization and Architecture – Designing for Performance", Pearson Education (2005)
5. P.Chakraborty, "Computer Architecture and Organization", Jaico Books (2008)

MCA 104: Discrete Mathematical Structures

UNIT-I:

The Foundations: Logic and Proofs: Propositional Logic – Propositional Equivalences – Predicates and Quantifiers – Nested Quantifiers – Rules of Inference – Introduction to Proofs – Proof Methods and Strategy

Basic Structures: Sets, Functions, Sequences and Sums: Sets – Set Operations – Functions – Sequences and Summations

The Fundamentals : Algorithms , The Integers and Matrices: Algorithms – The Growth of Functions – Complexity of Algorithms – The Integers And Divisions – Primes and Greatest Common Divisors – Integers and Algorithms – Applications of Number Theory – Matrices

Introduction and Recursion : Mathematical Induction – Strong Induction and Well-Ordering – Recursive Definitions and Structural Induction – Recursive Algorithms – Program Correctness

UNIT-II:

Counting: The Basics of Counting – The Pigeon Hole Principle – Permutations and Combinations – Binomial Coefficients – Generalized Permutations and Combinations – Generating Permutations and Combinations

Advanced Counting Techniques: Recurrence Relations – Solving Linear Recurrence Relations – Divide and Conquer Algorithms and Recurrence Relations – Generating Functions – Inclusion – Exclusion – Applications of Inclusion & Exclusion

UNIT-III:

Relations : Relations and Their Properties – n-ary Relations and Their Applications – Representing Relations – Closures of Relations – Equivalence Relations – Partial Orderings

Graphs: Graphs and Graph Models – Graph Terminology and Special Types of Graphs – Representing Graphs and Graph Isomorphism's – Connectivity – Euler and Hamilton Paths – Shortest Path Problems – Planar Graphs - Graph Coloring

UNIT-IV:

Trees: Introduction to Trees – Applications of Trees – Tree Traversal – Spanning Trees – Minimum Spanning Trees

Boolean Algebra: Boolean Functions – Representing Boolean Functions – Logic Gates – Minimization of Circuits

Prescribed Book:

Kenneth H Rosen, "Discrete Mathematics & its Applications", 6th Edition, McGraw-Hill (2007)

Chapters : 1 to 10

Reference Books:

1. Ralph P. Grimaldi, B.V. Ramana, "Discrete and Combinational Mathematics", 5th Edition, Pearson Education (2008).
2. Swapan Kumar Sarkar, "A Text Book of Discrete Mathematics", S.Chand (2008).
3. D.S.Malik and M.K.Sen, "Discrete Mathematical Structures", Thomson (2006).

MCA 105: Accounting And Financial Management

UNIT I:

Cost Accounting

- 1.1 Accounting concepts
- 1.2 Double entry system
- 1.3 Journal-ledger, trial balance, preparation of final accounts (problems)
- 1.4 Nature of financial statement-preparation of trading-profit and loss accounts-balance sheet of joint stock companies

UNIT II:

Cost Accounting

- 1.1 cost sheet
- 1.2 marginal costing (problems)
- 1.3 budget and budgetary control
- 1.4 standard costing (Problems)

UNIT III:

Financial Management

- 3.1 nature and scope of finance function-goals of financial management-modern concept of finance function.
- 3.2 Nature of financial decisions: concept-major financial decision areas-investment decision-financing decision and dividend decision.
- 3.3 Financial analysis: concept of financial analysis-types of analysis-tables of analysis-ratio analysis-tables of analysis-funds flow and cash flow analysis (Problems)

UNIT IV:

Working capital management

- 4.1 concepts of working capital-importance of working capital-components of working capital-determination of working capital-source of working capital.
- 4.2 Inventory management-accounts of receivable management-cash management
- 4.3 Forecasting of working capital management

Prescribed Book:

K.Rajeswara Rao & G.Prasad, Accounting and finance, Jaibharath publishers, 2002 (Chapters 1 to 19)

Reference Books:

1. Vanherne & James C, John M.Wachewiez J.R., Fundamentals of Financial management, PHI, 2002
2. Horngren, Sundem Blliott, Introduction to financial accounting, pearson education, 2002

3. Ambrish Gupta, "Financial Accounting for Management", Third Edition, Pearson Education (2009)
4. Paresh Shah, "Basic Financial Accounting for Management", Oxford Higher Education (2008)

MCA 106 : PC Software Lab

Lab Cycle

MS-WORD

1. Design an Invitation to invite Staff, students to a seminar on "Emerging Trends in Computers".
2. Assignment using Mail merge.
3. Creation of Bio-Data: consisting Name, email-id, Contact Address, Carrier Objective, Educational qualifications, social activities, achievements.
4. Assignment to implement macro operations.

MS-POWERPOINT

1. Make a Power point presentation on your carrier planning.
2. Make a Power point presentation on any Current affair.
3. Make a Power point presentation to represent a Software Company Profile.
4. Make a Power point presentation about things you learned during student life.

MS-ACCESS

1. Create a database using MS-ACCESS with atleast 5 records

TABLE₁ STRUCTURE:

EMPLOYEE NUMBER NAME DOB GENDER DEPARTMENT

TABLE₂ STRUCTURE:

EMPLOYEE NUMBER BASIC HRA DA DEDUCTIONS GROSS SALARY

Maintain the relationship between two tables with REGISTER NUMBER as a Primary Key and answer the following queries:

Show the list of Employees with the following fields as one query

EMPLOYEE NUMBER NAME GENDER GROSS SALARY

2. Maintain the relationship between above two tables with EMPLOYEE NUMBER as a Primary Key and generate following reports:

Report 1 : EMPLOYEE NUMBER, NAME, BASIC HRA DA DEDUCTIONS

Report 2 : EMPLOYEE NUMBER, DEPARTMENT, NET SALARY.

Use forms to enter data in to tables

3. Create a table and form with following fields
Book Number, Book Name, Author, Publisher, Price
Generate the report with following fields
All Books with price between Rs.500 and Rs.1000

MS-EXCEL

1. Create an electronic spreadsheet to convert
 - a. Decimal Numbers to Hexa decimal, Octal, Binary
 - b. Binary to Decimal, Octal, Hexadecimal
 - c. Hexadecimal to Decimal, Octal, Binary
2. The Cement Company shows the sales of different products for 5 years. Create column chart, Pie Chart and Bar chart for the following data

YEAR	PRODUCT-1	PRODUCT-2	PRODUCT-3	PRODUCT-4
2004	1000	800	900	1000
2005	800	80	500	900
2006	1200	190	400	800
2007	400	200	300	1000
2008	1800	400	400	1200

3. Demonstrate Hyper Linking in Excel.

MCA 107 : C Programming Lab

Lab Cycle

1. Program to calculate compound interest.
2. Program to calculate roots of a quadratic equation.
3. Program to average of 'n' numbers.
4. Program to find wheather the given number is
 - (i) Prime number or not
 - (ii) Perfect number or not
 - (iii) Armstrong number or not
 - (iv) Palindrome or not
5. Program to demonstrate function calling multiple times.
6. Program to read two integers and print the quotient and remainder of the first number divided by the second number.
7. Program to get the following output.

Row 1 :	1	2	3	4	5
Row 2 :	1	2	3	4	5
Row 3 :	1	2	3	4	5
8. Program for sum of digits of an integer number.
9. Program for following using Recursion
 - (i) Factorial of a number
 - (ii) Fibonacci series
10. Program to write records in to a file.
11. Program to read records from a file sequentially.
12. Program to search a record in a file.
13. Program to update a record in a file.
14. Program to delete a record in a file.
15. Program to calculate average of n no's in an array.
16. Program for addition of matrix.
17. Program for multiplication of matrix.
18. Program for sorting an array.
19. Program for row and column total of a two dimensional array.
20. Program to sort strings using pointers.
21. Program to calculate
 - (i) No.of lines
 - (ii) No.of words
 - (iii) No.of special characters.
22. Program to demonstrate string palindrome.
23. Program to demonstrate union in structure.
24. Program for (i) String Comparison (ii) String Copy
25. Program to demonstrate call by value and call by reference.
26. Program to calculate area of a Hall using macros.
27. Program to calculate no.of vowels, words in a text.

MCA 108 : Seminar

MCA 201: Language Processors

Unit-I

Language Processors: Introduction – Language processing activities – Fundamentals of language processing – Fundamentals of language specification – Language processor development tools.

Data Structures for language processing: Search data structures, Allocation data structures.

Unit-II

Scanning and parsing: Scanning – Parsing

Assemblers: Elements of assembly language programming – A simple assembly scheme – Pass structure of assemblers – Design of a two pass assembler – A single pass assembler for IBM PC.

Unit-III

Macros and Macro processors: Macro definition and call – Macro expansion – Nested macro calls – Advanced Macro facilities – Design of a macro preprocessor.

Compilers and Interpreters: Aspects of compilation – Memory allocation – compilation of expressions – compilation of control structures – code optimization – Interpreters.

Unit-IV

Linkers: Relocation and linking concepts – Design of a linker, self relocating programs – A linker for MS DOS – Linker for overlays – loaders.

Software tools: Software tools for program development – Editors – Debug monitors – Programming environments – User Interfaces.

Prescribed Book: D.M. Dhamdhere, "Systems programming and Operating systems", 2nd revised edition, TMH (2008).

Chapters : 1 through 8

MCA 202: Database Management Systems

Unit-I

Databases and Database Users: Introduction, Characteristics of the Database Approach, Actors on the Scene, Workers behind the scene, Advantages of the using the DBMS Approach.

Database System Concepts and Architecture: Data Models, Schemas and Instances, Three Schema architecture and Data Independence, Database Languages and Interfaces, Centralized and Client/Server Architecture for DBMS, Classification of Database Management Systems.

Disk Storage, Basic File Structures and Hashing: Introduction, Secondary Storage Devices, Buffering of Blocks, Placing file Records on Disk, Operations on Files, Files of Unordered Records, Files of Ordered Records, Hashing Techniques, Other Primary File Organizations, Parallelizing Disk Access using RAID Technology.

Indexing Structures for Files: Types of Single-Level Ordered Indexes, Multilevel Indexes, Dynamic Multilevel Indexes Using B-Trees and B⁺ Trees, Indexes on Multiple Keys, Other Types of Indexes.

Data Modeling Using the ER Model: Conceptual Data models, Entity Types, Entity Sets, Attributes and Keys, Relationship types, Relationship sets, roles and structural Constraints, Weak Entity types, Relationship Types of Degree Higher than Two, Refining the ER Design for the COMPANY Database.

The Enhanced Entity-Relationship Model: Sub classes, Super classes and Inheritance, Specialization and Generalization, Constraints and Characteristics of Specialization and Generalization Hierarchies, Modeling of Union Types using Categories, An Example University ERR Schema, Design Choices and Formal Definitions.

Unit-II

The Relational Data Model and Relational Database Constraints: Relational Model Concepts, Relational Model Constraints and Relational Database Schemas, Update Operations, Transactions and Dealing with Constraint Violations.

The Relational Algebra and Relational Calculus: Unary Relational Operations: SELECT and PROJECT, Relational Algebra Operations from set Theory, Binary Relational Operations: JOIN and DIVISION, Additional Relational Operations, Examples, The Tuple Calculus and Domain Calculus.

SQL-99: Schema Definition, Constraints, Queries and Views: SQL Data Definitions and Data Types, Specifying Constraints in SQL, Schema Change Statements on SQL, Basic Queries in SQL, More Complex SQL Queries, INSERT, DELETE and UPDATE statements in SQL, Triggers and Views.

Unit-III

Functional Dependencies and Normalization for Relational Databases: Informal Design Guidelines for Relation Schemas, Functional dependencies, Normal Forms Based in Primary Keys, General Definitions of Second and Third Normal Forms, Boyce-Codd Normal Form.

Relational Database Design Algorithms and Further Dependencies: Properties of Relational Decompositions, Algorithms for Relational Database Schema Design, Multivalued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form, Inclusion Dependencies, Other Dependencies and Normal Forms.

Unit-IV

Introduction to Transaction Processing Concepts and Theory: Introduction to Transaction Processing, Transaction and System Concepts, Desirable Properties of Transactions, Characterizing Schedules Based on Recoverability, Characterizing schedules Based on Serializability.

Concurrency Control Techniques: Two Phase Locking Techniques for Concurrency Control, Concurrency Control Based on Timestamp Ordering, Multiversion Concurrency control techniques, Validation concurrency control Techniques, Granularity of Data Items and multiple Granularity Locking.

Distributed Databases and Client Server Architectures: Distributed Database Concepts, Data Fragmentation, Replication, and allocation Techniques for Distributed Database Design, Types of Distributed Database Systems, An Overview of 3 Tier Client Server Architecture.

Prescribed Text :

Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", Fifth Edition, Pearson Education (2007)

Chapters: 1.1 to 1.6, 2, 13.1 to 13.10, 14, 3.1 to 3.6,
3.9, 4.1 to 4.5, 5, 6, 8, 10, 11, 17, 18.1 to 18.5,
25.1 to 25.3, 25.6

Reference Books :

1. Peter Rob, Carlos Coronel, "Database Systems" – Design, Implementation and Management, Eighth Edition, Thomson (2008).
2. C.J. Date, A.Kannan, S. Swamynathan, "An Introduction to Database Systems", VII Edition Pearson Education (2006).
3. Raman A Mata – Toledo, Panline K. Cushman, "Database Management Systems", Schaum's Outlines, TMH (2007).
4. Steven Feuerstein, "Oracle PL/SQL – Programming", 10th Anniversary Edition, OREILLY (2008).

MCA 203 : Data Structures Using C++

Unit – I

Software Engineering Principles and C++ Classes : **Classes: Variable - Accessing Class members – Operators – Functions and Classes – Reference parameters and Class Objects – Implementation of member function – Constructors – Destructors ; Data Abstraction, Classes and ADT – Information Hiding.**

Pointers and Array based Lists : **Pointer Data types and Pointer variables: Declaring Pointer Variables – Address of Operator – Dereferencing Operator - Classes, Structures and Pointer Variables – Initializing Pointer Variables – Dynamic Variables – Operators on Pointer Variables.**

Unit – II

Linked Lists : **Linked List – Properties – Item Insertion and Deletion – Building a Linked List – Linked List as an ADT – Ordered Linked Lists – Doubly Linked Lists – Linked Lists with header and trailer nodes – Circular Linked Lists.**

Recursion : **Recursive Definitions – Problem solving using recursion – Recursion or iteration - Recursion and Backtracking : n- Queens Puzzle.**

Search Algorithms : **Search Algorithms: Sequential – Binary search – Performance of binary search – insertion into ordered list; Hashing : Hash functions – Collision Resolution – Hashing : Implementation using Quadratic Probing – Collision Resolution : Chaining.**

Unit – III

Stacks : **Stack operations – Implementation of stacks as arrays – Linked implementation of stacks – Application of stacks.**

Queues : **Queues : Queue operations – Implementation of Queues as arrays ; Linked implementation of Queues ; Priority Queue ; Application of Queues.**

Sorting Algorithms : **Selection Sort – Insertion Sort – Quick Sort – Merge Sort – Heap Sort.**

Unit – IV

Trees : **Binary Trees – Binary Tree Traversal – Binary Search Tree – Nonrecursive Binary Tree Traversal Algorithms – AVL Trees.**

Graphs : **Graph Definitions and Notations – Graph Representation – Operations on graphs – Graph as ADT – Graph Traversals – shortest path**

Algorithm – Minimal Spanning Tree.

Prescribed Book:

D.S.Malik , " Data Structures using C++ " , Cengage Learning India Edition (2008).
(Chapters 1, 3, 5, 6, 7, 8, 9, 10, 11 and 12.)

Reference Books:

1. Mark Allen Weiss , "Data structures and Algorithm Analysis in C++" , Third Edition , Pearson Education (2008).
2. Adam Drozdek , "Data Structures and Algorithms in C++" , Cengage Learning , India Edition .

MCA 204: Operating System Principles

UNIT-I:

Introduction : What Operating Systems Do – Computer System Organization – Computer system Architecture – Operating System Structure – Operating System Operations – Process Management – Memory Management – Storage Management – Protection and Security – Distributed Systems – Special purpose Systems – Computing Environments.

System Structure: Operating System Services – User Operating System Interface – System Calls – Types of System Calls – System Programs – Operating System Design and Implementation – Operating System Structure – Virtual Machine – Operating System Generation – System Boot.

Process Concept : Overview – Process Scheduling – Operations on Processes – Interprocess Communication – Examples of IPC Systems – Communication in Client Server Systems.

UNIT-II:

Multithreaded Programming : Overview – Multithreading Models – Thread Libraries – Threading Issues – Operating System Examples.

Process Scheduling: Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple Processor Scheduling – Thread Scheduling.

Synchronization: Background – The Critical Section Problem – Peterson's solution – Synchronization Hardware – Semaphores – Classic Problem of Synchronization – Monitors – Synchronization Examples – Atomic Transaction.

UNIT-III:

Deadlocks : System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock.

Memory Management Strategies: Background – Swapping – Contiguous Memory Allocation – Paging – Structure of the Page Table – Segmentation – Example: The Intel Pentium.

Virtual Memory Management: Background – Demand Paging – Copy on Write – Page Replacement – Allocation of Frames – Thrashing.

UNIT-IV:

File System : File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection.

Implementing File Systems :File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free Space Management – Efficiency and Performance – Recovery – Log structured File Systems.

Secondary Storage Structure : Overview of Mass – Storage Structure – Disk Structure – Disk Attachment – Disk Scheduling – Disk Management – Swap Space Management – RAID structure.

I/O Systems: Overview – I/O Hardware – Application I/O Interface – Kernal I/O Interface – Transforming I/O requests to Hardware Operations – Streams – Performance.

Prescribed Book:

Abraham Silberschatz, Peter Baer Galvin, Greg Gagne. "Operating System Principles", Seventh Edition, Wiley.

Chapters: 1.1 – 1.12, 2.1 – 2.10, 3.1 – 3.6, 4.1 – 4.5,
5.1 – 5.5, 6.1 – 6.9 , 7.1 – 7.7 , 8.1 – 8.7,
9.1 – 9.6, 10.1 – 10.6, 11.1 – 11.8, 12.1 – 12.7,
13.1 – 13.7

Reference Book:

1. William Stallings, "Operating Systems – Internals and Design Principles", Fifth Edition, Pearson Education (2007)
2. Achyut S Godbole, "Operating Systems", Second Edition, TMH (2007).
3. Flynn/McHoes, "Operating Systems", Cengage Learning (2008).
4. Deitel & Deitel, "Operating Systems", Third Edition, Pearson Education (2008).

M.C.A 205: Probability and Statistics

Unit I:

Some probability laws: Axioms of Probability, Conditional Probability, Independence of the Multiplication Rule, Bayes' theorem

Discrete Distributions: Random Variables, Discrete Probability Densities, Expectation and distribution parameters, Binomial distribution, Poisson distribution, simulating a Discrete distribution,

Continuous distributions: continuous Densities, Expectation and distribution parameters, exponential distribution, Normal distribution, Weibull distribution and Reliability.

UNIT II:

Estimation: Point estimation, interval estimation and central limit theorem.

Inferences on the mean and the Variance of a distribution: Hypothesis Testing, significance testing, Hypothesis and significance test on the mean, Hypothesis tests on the Variance

Inferences on proportions: estimating proportions, testing hypothesis on a proportion, Comparing two proportions: estimation, comparing two proportions: hypothesis testing.

UNIT III:

Comparing two means and two variances: point estimation: independent samples, Comparing variances: the F-distribution,

Comparing means: variances equal,

Analysis of Variance: One-way classification fixed effects model, comparing variances, pair wise comparisons, randomized complete block design

UNIT IV:

Simple linear regression and correlation : model and parameter estimation, inferences about slope, inferences about intercept, Co-efficient of determination

Multiple linear regression models: least square procedures for model fitting, a matrix approach to least squares, interval estimation.

Prescribed book:

J Susan Milton and Jesse C. Arnold: "Introduction to Probability and Statistics", Fourth edition, TMH, (2007).

Chapters: 2, 3.1 to 3.3, 3.5, 3.8, 3.9, 4.1, 4.2, 4.4, 4.7.1, 7.4, 8.3 to 8.6, 9, 10.1 to 10.3, 11.1, 11.3, 11.6, 12.1, 12.2, 12.4, 13.1 to 13.3, 13.5.

Reference book:

William Mendenhall, Robert J Beaver, Barbara M Beaver: Introduction to Probability and Statistics, Twelfth edition, Thomson.

MCA 206: Data Structures Using C++ Lab

Lab cycle

1. Write a program for implementing the operations on complex numbers using classes.
2. Program for finding the area of circle, rectangle and room using function overloading.
3. Program for finding the volume of box using constructor overloading.
4. Program for Sorting 'n' elements Using bubble sort technique.
5. Sort given elements using Selection Sort.
6. Sort given elements using Insertion Sort.
7. Sort given elements using Merge Sort.
8. Sort given elements using Quick Sort.
9. Implement the following operations on single linked list.
(i) Creation (ii) Insertion (iii) Deletion (iv) Display
10. Implement the following operations on double linked list.
(i) Creation (ii) Insertion (iii) Deletion (iv) Display
11. Implement the following operations on circular linked list.
(i) Creation (ii) Insertion (iii) Deletion (iv) Display
12. Program for splitting given linked list.
13. Program for traversing the given linked list in reverse order.
14. Merge two given linked lists.
15. Create a linked list to store the names of colors.
16. Implement Stack Operations Using Arrays.
17. Implement Stack Operations Using Linked List.
18. Implement Queue Operations Using Arrays.
19. Implement Queue Operations Using Linked List.
20. Implement Operations on Circular Queue.
21. Construct and implement operations on Priority Queue.
22. Implement Operations on double ended Queue.
23. Converting infix expression to postfix expression by using stack.
24. Write program to evaluate post fix expression.
25. Implement Operations on two way stack.
26. Add two polynomials using Linked List.
27. Multiply Two polynomials using Linked List.
28. Construct BST and implement traversing techniques recursively.
29. Implement preorder traversal on BST non recursively.
30. Implement inorder traversal on BST non recursively.
31. Implement postorder traversal on BST non recursively.
32. Implement binary search techniques recursively.

MCA 207: DBMS Lab

Lab cycle

Cycle-I: Aim: Marketing Company wishes to computerize their operations by using following tables.

Table Name: Client_Master

Description: This table stores the information about the clients.

Column Name	Data Type	Size	Attribute
Client_no	Varchar2	6	Primary Key and first letter should starts with 'C'
Name	Varchar2	10	Not null
Address1	Varchar2	10	
Address2	Varchar2	10	
City	Varchar2	10	
State	Varchar2	10	
Pincode	Number	6	Not null
Bal_due	Number	10,2	

Table Name:Product_master

Description: This table stores the information about products.

Column Name	Data Type	Size	Attribute
Product_no	Varchar2	6	Primary Key and first letter should starts with 'P'
Description	Varchar2	10	Not null
Profit_percent	Number	2,2	Not null
Unit_measure	Varchar2	10	
Qty_on_hand	Number	8	
Record_lvl	Number	8	
Sell_price	Number	8,2	Not null, can't be o
Cost_price	Number	8,2	Not null, can't be o

Table Name: salesman_master

Description: This table stores the salesmen working in the company

Column Name	Data Type	Size	Attribute
Salesman_id	Varchar2	6	Primary Key and first letter should starts with 'S'
Name	Varchar2	10	Not null
Address1	Varchar2	10	
Address2	Varchar2	10	
City	Varchar2	10	

State	Varchar2	10	
Pincode	Number	6	Not null
Sal_amt	Number	8,2	Should not null and zero
Target_amt	Number	6,2	Should not null and zero
Remarks	Varchar2	10	

Table Name: sales_order

Description: This table stores the information about orders

Column Name	Data Type	Size	Attribute
S_order_no	Varchar2	6	Primary Key and first char is 'O'
S_order_date	Date		
Client_no	Varchar2	6	Foreign key
Delve_address	Varchar2	20	
Salesman_no	Varchar2	6	Foreign key
Delve_type	Varchar2	1	Delivery: part(P)/Full(F) and default 'F'
Billed_yn	Char	1	
Delve_date	Date		Can't be less than the s_order_date
Order_status	Varchar2	10	Values in 'IN PROCESS', 'FULFILLED', 'BACK ORDER', 'CANCELLED'

Table Name: sales_order_details

Description: This table stores the information about products ordered

Column Name	Data Type	Size	Attribute
S_order_no	Varchar2	6	Primary key, foreign key references sales_order table
Product_no	Varchar2	6	Primary key, foreign key references product_master table
Qty_ordered	Number	8	
Qty_disp	Number	8	
Product_rate	Number	10,2	

Table Name: challan_master

Description: This table stores the information about challans made for orders.

Column Name	Data Type	Size	Attribute
Challan_no	Varchar2	6	Primary key, first two letters must start with 'CH'
S_order_no	Varchar2	6	Foreign key references sales_order
Challan_date	Date		

Billed_yn	Char	1	Values in 'Y', 'N' default 'N'
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Table Name: Challan_Details

Description: This table stores the information about challan details.

Column Name	Data Type	Size	Attribute
Challan_no	Varchar2	6	Primary key, foreign key references challan_master table
Product_no	Varchar2	6	Primary key, foreign key references product_master table
Qty_disp	Number	4,2	Not null

Solve the following queries by using above tables.

1. Retrieve the list of names and cities of all the clients.
2. List the various products available from product_master.
3. Find out the clients who stay in a city whose second letter is 'a'.
4. Find the list of all clients who stay in the city 'CHENNAI' or 'DELHI'.
5. List all the clients located at 'CHENNAI'.
6. Print the information from sales order as the order the places in the month of January.
7. Find the products with description as 'Floppy Drive' and 'Pen drive'.
8. Find the products whose selling price is grater than 2000 and less than or equal to 5000.
9. Find the products whose selling price is more than 1500 and also find the new selling price as original selling price *15.
10. Find the products in the sorted order of their description.
11. Divide the cost of product '540 HDD' by difference between its price and 100.
12. List the product number, description, sell price of products whose description begin with letter 'M'.
13. List all the orders that were cancelled in the month of March.
14. Count the total number of orders.
15. Calculate the average price of all the products.
16. Determine the maximum and minimum product prices.
17. Count the number of products having price grater than or equal to 1500.
18. Find all the products whose quantity on hand is less than reorder level.
19. Find out the challan details whose quantity dispatch is high.
20. Find out the order status of the sales order, whose order delivery is maximum in the month of March.
21. Find out the total sales made by the each salesman.
22. Find the total revenue gained by the each product sales in the period of Q1 and Q2 of year 2006.
23. Print the description and total qty sold for each product.
24. Find the value of each product sold.
25. Calculate the average qty sold for each client that has a maximum order value of 1,50,000.

26. List the products which has highest sales.
27. Find out the products and their quantities that will have to deliver in the current month.
28. Find the product number and descriptions of moving products.
29. Find the names of clients who have purchased 'CD DRIVE'.
30. List the product numbers and sales order numbers of customers having quantity ordered less than 5 from the order details for the product '1.44 Floppies'.
31. Find the product numbers and descriptions of non-moving products.
32. Find the customer names and address for the clients, who placed the order '019001'.
33. Find the client names who have placed orders before the month of May, 2006.
34. Find the names of clients who have placed orders worth of 10000 or more.
35. Find out if the product is '1.44 drive' is ordered by any client and print the client number, name to whom it is sold.

Cycle-II

Aim: A Manufacturing Company deals with various parts and various suppliers supply these parts. It consists of three tables to record its entire information. Those are as follows

S(SNO,SNAME,CITY,STATUS)
 P(PNO,PNAME,COLOR,WEIGHT,CITY,COST)
 SP(SNO,PNO,QTY)
 J(JNO,JNAME,CITY)
 SPJ(SNO,PNO,JNO,QTY)

33. Get Suppliers Names for Suppliers who supply at least one red part.
34. Get Suppliers Names for Suppliers who do not supply part 'P2'
35. Using Group by with Having Clause, Get the part numbers for all the parts supplied by more than one supplier.
36. Get supplier numbers for suppliers with status value less the current max status value.
37. Get the total quantity of the part 'P2' supplied.
38. Get the part color, supplied by the supplier 'S1'
39. Get the names of the parts supplied by the supplier 'Smith' and "Black"
40. Get the Project numbers, whose parts are not in Red Color, from London.
41. Get the suppliers located from the same city.
42. Get the suppliers, who does not supply any part.
43. Find the pnames of parts supplied by London Supplier and by no one else.
45. Find the sno's of suppliers who charge more for some part than the average cost of that part.
46. Find the sid's of suppliers who supply only red parts.
47. Find the sid's of suppliers who supply a red and a green part.
48. Find the sid's of suppliers who supply a red or green part.

Cycle: III

An Airline System would like to keep track their information by using the following relations.

Flights (flno: integer, from: string, to: string, distance: integer,
Price: integer)

Aircraft (aid: integer, aname: string, cruising_range: integer)

Certified (eid: integer, aid: integer)

Employees (eid: integer, ename: string, salary: real)

Note that the employees relation describes pilots and other kinds of employees as well; every pilot is certified for aircraft and only pilots are certified to fly. Resolve the following queries:

1. For each pilot who is certified for more than three aircraft, find the eid's and the maximum cruising range of the aircraft that he (or She) certified for.
2. Find the names of pilots whose salary is less than the price of the cheapest route from Los Angeles to Honolulu.
3. Find the name of the pilots certified from some Boeing aircraft.
4. For all aircraft with cruising range over 1,000 miles, find the name of the aircraft and the average salary of all pilots certified for this aircraft.
5. Find the aid's of all aircraft than can be used from Los Angels to Chicago.
6. Print the enames of pilots who can operate planes with cruising range greater than 3,000 miles, but are not certified by Boeing aircraft.
7. Find the total amount paid to employees as salaries.
8. Find the eid's of employees who are certified for exactly three aircrafts.
9. Find the eid's of employee who make second highest salary.
10. Find the aid's of all than can be used on non-stop flights from Bonn to Chennai.

Cycle: IV : Employee Database

Aim: An enterprise wishes to maintain a database to automate its operations. Enterprise divided into to certain departments and each department consists of employees. The following two tables describes the automation schemas

DEPT (DEPTNO, DNAME, LOC)

EMP (EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)

1. Create a view, which contain employee names and their manager names working in sales department.
2. Determine the names of employee, who earn more than there managers.
3. Determine the names of employees, who take highest salary in their departments.
4. Determine the employees, who located at the same place.
5. Determine the employees, whose total salary is like the minimum

- salary of any department.
6. Update the employee salary by 25%, whose experience is greater than 10 years.
 7. Delete the employees, who completed 32 years of service.
 8. Determine the minimum salary of an employee and his details, who join on the same date.
 9. Determine the count of employees, who are taking commission and not taking commission.
 10. Determine the department does not contain any employees.
 11. Find out the details of top 5 earners of company. (Note: Employee Salaries should not be duplicate like 5k,4k,4k,3k,2k)
 12. Display those managers name whose salary is more than an average salary of his employees.
 13. Display the names of the managers who is having maximum number of employees working under him?
 14. In which year did most people join the company? Display the year and number of employees.
 15. Display ename, dname even if there no employees working in a particular department(use outer join).

PL/SQL PROGRAMS

1. WRITE A PL/SQL PROGRAM TO CHECK THE GIVEN NUMBER IS STRONG OR NOT.
2. WRITE A PL/SQL PROGRAM TO CHECK THE GIVEN STRING IS PALINDROME OR NOT.
3. WRITE A PL/SQL PROGRAM TO SWAP TWO NUMBERS WITHOUT USING THIRD VARIABLE.
4. WRITE A PL/SQL PROGRAM TO GENERATE MULTIPLICATION TABLES FOR 2, 4, 6
5. WRITE A PL/SQL PROGRAM TO DISPLAY SUM OF EVEN NUMBERS AND SUM OF ODD NUMBERS IN THE GIVEN RANGE.
6. WRITE A PL/SQL PROGRAM TO CHECK THE GIVEN NUMBER IS PALLINDROME OR NOT.
7. THE HRD MANAGER HAS DECIDED TO RAISE THE EMPLOYEE SALARY BY 15%. WRITE A PL/SQL BLOCK TO ACCEPT THE EMPLOYEE NUMBER AND UPDATE THE SALARY OF THAT EMPLOYEE. DISPLAY APPROPRIATE MESSAGE BASED ON THE EXISTENCE OF THE RECORD IN EMP TABLE.
8. WRITE A PL/SQL PROGRAM TO DISPLAY TOP 10 ROWS IN EMP TABLE BASED ON THEIR JOB AND SALARY.

9. WRITE A PL/SQL PROGRAM TO RAISE THE EMPLOYEE SALARY BY 10%, FOR DEPARTMENT NUMBER 30 PEOPLE AND ALSO MAINTAIN THE RAISED DETAILS IN THE RAISE TABLE.
10. WRITE A PROCEDURE TO UPDATE THE SALARY OF EMPLOYEE, WHO ARE NOT GETTING COMMISSION BY 10%.
11. WRITE A PL/SQL PROCEDURE TO PREPARE AN ELECTRICITY BILL BY USING FOLLOWING TABLE USED: ELECT

NAME	NULL?	TYPE
MNO	NOT NULL	NUMBER(3)
CNAME		VARCHAR2(20)
CUR_READ		NUMBER(5)
PREV_READ		NUMBER(5)
NO_UNITS		NUMBER(5)
AMOUNT		NUMBER(8,2)
SER_TAX		NUMBER(8,2)
NET_AMT		NUMBER(9,2)

12. WRITE A PL/SQL PROCEDURE TO PREPARE AN TELEPHONE BILL BY USING FOLLOWING TABLE. AND PRINT THE MONTHLY BILLS FOR EACH CUSTOMER TABLE USED : PHONE.

NAME	NULL?	TYPE
-----	-----	-----
TEL_NO	NOT NULL	NUMBER(6)
CNAME		VARCHAR2(20)
CITY		VARCHAR2(10)
PR_READ		NUMBER(5)
CUR_READ		NUMBER(5)
NET_UNITS		NUMBER(5)
TOT_AMT		NUMBER(8,2)

13. WRITE A PL/SQL PROGRAM TO RAISE THE EMPLOYEE SALARY BY 10%, WHO ARE COMPLETED THERE 25 YEARS OF SERVICE AND STORE THE DETAILS AT APPROPRIATE TABLES (DEFINE THE RETAIR_EMP TABLE).
14. WRITE A PL/SQL PROCEDURE TO EVALUATE THE GRADE OF A STUDENT WITH FOLLOWING CONDITIONS:

FOR PASS: ALL MARKS > 40
 FOR I CLASS: TOTAL% > 59
 FOR II CLASS: TOTAL% BETWEEN > 40 AND < 60
 FOR III CLASS: TOTAL% = 40

AND ALSO MAINTAIN THE DETAILS IN ABSTRACT TABLE.

TABLES USED

1. TABLE STD

NAME	NULL?	TYPE
-----	-----	-----
NO	NOT NULL	NUMBER
NAME		VARCHAR2(10)
INTNO		NUMBER
CLASS	NOT NULL	VARCHAR2(10)
M ₁	NUMBER	
M ₂	NUMBER	
M ₃	NUMBER	
M ₄	NUMBER	
M ₅	NUMBER	

2. TABLE ABSTRACT

NAME	NULL?	TYPE
-----	-----	-----
STDNO		NUMBER
STDNAME		VARCHAR2(10)
CLASS		VARCHAR2(10)
MONTH		VARCHAR2(10)
INTNO (INTERNAL NUMBER)		NUMBER
TOT		NUMBER
GRADE		VARCHAR2(10)
PERCENT		NUMBER
DAT_ENTER		DATE

15. CREATE AN VARRAY, WHICH HOLDS THE EMPLOYEE PHONE NUMBERS (AT LEAST THREE NUMBERS).
16. CREATE AN OBJECT TO DESCRIBE THE DETAILS OF ADDRESS TYPE DATA.
17. WRITE A PL/SQL PROCEDURE TO READ THE DATA INTO THE TABLE AS PER THE FOLLOWING DESCRIPTION.

Attribute Name	Data Type	DETAILS
EMPLOYEE NUMBER	NUMBER	
EMPLOYEE NAME	CHARACTER	
ADDRESS	OBJECT	STREET NUMBER
		STREET NAME
		TOWN
		DIST AND STATE

QUALIFICATION	CHARACTER	
PHONE NUMBER	OBJECT- VARRAY	HOLDS THREE PHONE NUMBER

MCA 208: Communication Skills

Prescribed Books :

1. Raymond Murphy, "Essential English Grammar", Second Edition, Cambridge University Press (2008)
2. Leena Sen, "Communication Skills", Second Edition, PHI (2008)

Reference Books :

1. Aysha Viswamohan, "English for Technical Communication", TMH (2008)
2. P. Kiranmai Dutt, Geetha Rajeevan, "Basic Communication Skills", Foundation Books (2007)
3. T.M. Farhathullah, "Communication Skills for Technical Students", Orient Longman (2002)
4. E.Suresh Kumar, P. Sreehari, "Communicative English", Orient Longman (2007)

MCA 301: Object Oriented Programming with JAVA

Unit-I

Object Oriented Programming : Introduction to OOP, Objects and Classes, Characteristics of OOP, Difference between OOP and Procedure Oriented Programming, Summary

Introduction to Java Programming : Introduction, Features of Java, Comparing Java and other languages, Applications and Applets, Java Development Kit, More Complex Programs, Java Source file structure, Prerequisites for Compiling and Running Java Programs.

Java Language Fundamentals : The building Blocks of Java – Data types – variable declarations – wrapper classes – Operators and Assignment – Control structures – Arrays – Strings – The String Buffer Class.

Unit-II

Java as an OOP Language : Defining classes – Modifiers – Packages – Interfaces.

Exception Handling : Introduction – Basics of Exception Handling in Java – Exception Hierarchy – Constructors and Methods in Throwable class – Unchecked and checked exceptions – Handling exceptions in Java – Exception and Inheritance – Throwing User defined Exceptions – Redirecting and Rethrowing Exceptions – Advantages of Exception – Handling Mechanism.

Unit-III

Multithreading : Introduction : An Overview of Threads – Creating Threads – Thread Life – cycle – Thread priorities and Thread scheduling – Thread synchronization – Thread groups – Communication of Threads.

Files and I/O Streams : An Overview of I/O streams – Java I/O – File streams – File Input stream and File output stream – Filter streams – Random Access File – Serialization.

Applets : Introduction – Java applications versus Java Applets – Applet Life cycle – Working with Applets – The HTML Applet Tag.

Unit-IV

Database Handling Using JDBC : An Overview of DBMS – JDBC Architecture – Working with JDBC

Servlets : Introduction – How to run servlets – The Life – cycle of the servlet – servlet API – Multitier Applications using JDBC from a servlet.

Networking and Remote Method Invocation : Introduction to Networking – Understanding Ports – Networking classes in JDK – Introduction to RMI – RMI Architecture – Implementing Remote class and interface – security.

Prescribed Book:

P. Radha Krishna, "Object Oriented Programming through Java", Universities Press (2008)

Chapters:1,2,3,4,5,6.1-6.5,6.7,6.8,7,8.1-8.5,9.1-9.3,
12.1-12.5, 13

Reference Books:

1. Cay S. Horstmann Gray Cornell, "Core Java – Volume 1 Fundamentals", Eighth Edition, Pearson Education
2. E.Balagurusamy, "Programming with Java", 3e, TMH (2007)
3. H.M.Deitel, P.J.Deitel, "Java How to Program", Sixth Edition, Pearson Education (2007)
4. Debasish Jana, "Java and Object Oriented Programming Paradigm", PHI (2005).
5. ISRD Group, "Introduction to Object Oriented Programming through Java", TMH (2007).

MCA 302: Computer Networks

UNIT – I

Introduction : Uses of Computer Networks: Business Application, Home Applications, Mobile Users – Social Issues. Network Hardware : Local Area Networks – Metropolitan Area Networks – Wide Area Networks – Wireless Networks – Home Networks – Internetworks. Network Software: Protocol Hierarchies – Design Issues for the Layers – Connection Oriented and Connectionless Services – Service Primitives – The relationship of Services to Protocols. Reference Models: The OSI Reference Model – The TCP/IP Reference Model – A Comparison of OSI and TCP/IP reference Model – A Critique of the OSI Model and Protocols – A Critique of the TCP/IP reference model. Example Networks: The Internet – Connection Oriented Networks: x.25, Frame Relay, and ATM – Ethernet – Wireless LANs Network Standardization: Who's who in the Telecommunication World – Who's who in the International Standards World – Who's who in the Internet Standards World.

Physical Layer: Guided Transmission Media: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics

Data Link Layer: Data Link Layer Design Issues: Services Provided to the Network Layer – Framing – Error Control – Flow Control. Error Detection and Correction: Error correcting Codes – Error Detecting Codes. Elementary Data Link Protocols : An unrestricted Simplex Protocol – A simplex Stop- and – wait Protocol – A simplex Protocol for a Noisy channel. Sliding Window Protocols: A one-bit sliding Window Protocol – A Protocol using Go Back N – A Protocol using selective Repeat. Example Data Link Protocols: HDLC – The Data Link Layer in the Internet.

UNIT – II

The Medium Access Control Sublayer : Ethernet : Ethernet Cabling – Manchester Encoding – The Ethernet MAC sublayer Protocol – The Binary Exponential Backoff Algorithm – Ethernet Performance – Switched Ethernet – Fast Ethernet – Gigabit Ethernet – IEEE 802.2: Logical Link Control – Retrospective on Ethernet. Wireless LANS: The 802.11 Protocol Stack - The 802.11 Physical Layer - The 802.11 MAC sublayer Protocol - The 802.11 Frame Structure. Bluetooth: Bluetooth Architecture – Bluetooth Applications – The Bluetooth Protocol Stack – The Bluetooth Radio Layer – The Bluetooth Baseband Layer – The Bluetooth L2CAP layer – The Bluetooth Frame Structure. Data Link Layer Switching: Bridges from 802.x to 802.y – Local Internetworking – Spanning Tree Bridges – Remote Bridges – Repeaters, Hubs, Bridges, Switches, Routers and Gateways – Virtual LANs.

UNIT – III

The Network Layer: Network Layer Design Issues : Store – and Forward Packet Switching – Services Provided to the Transport Layer – Implementation of Connectionless Services – Implementation of Connection Oriented Services – Comparison Of Virtual Circuit and Datagram subnets. Routing Algorithms : The Optimality Principle – Shortest Path Routing –

Flooding – Distance Vector Routing – Link State Routing – Hierarchical Routing – Broadcast Routing – Multicast Routing – Routing for Mobile Hosts. Internet Working : How Networks Differ – How Networks can be connected – Concatenated Virtual Circuits – Connectionless Internetworking – Tunneling – Internet work Routing – Fragmentation. The Network Layer in the Internet: The IP Protocol – IP address – Internet Control Protocols – OSPF – The Internet Gateway Routing Protocol – BGP – The Exterior Gateway Routing Protocol.

The Transport Layer: The Transport Service: Services provided to the Upper Layers – Transport Services Primitives – Berkeley Sockets. Elements of Transport Protocols : Addressing – Connection Establishment – Connection Release – Flow Control and Buffering – Multiplexing – Crash Recovery. The Internet Transport Protocols :UDP
Introduction to UDP – Remote Procedure Call – The Real Time Transport Protocol. The Internet Transport Protocols: TCP Introduction to TCP – The TCP Service Model – the TCP Protocol – The TCP segment header – TCP connection establishment – TCP connection release – Modeling TCP connection management- TCP Transmission Policy – TCP congestion Control – TCP Timer Management – Wireless TCP and UDP – Transactional TCP.

UNIT – IV:

The Application Layer: DNS : The Domain Name System : The DNS Name Space – Resource Records – Name Servers. Electronic Mail : Architecture and Services – The User Agent – Message Formats – Message Transfer – Final Delivery. The World Wide Web: Architecture Overview – Static Web Documents – Dynamic Web Documents – HTTP – The Hyper Text Transfer Protocol – Performance Enhancements – The Wireless Web. Multimedia: Introduction to Digital Audio – Audio Compression – Streaming Audio – Internet Radio – Voice Over IP – Introduction to Video – Video Compression – Video on Demand.

Prescribed Book:

Andrew S. Tanenbaum, "Computer Networks", Fourth Edition, PHI.

Chapters: 1.1 to 1.6, 2.2, 3.1 to 3.4, 3.6, 4.3, 4.4, 4.6, 4.7,
5.1, 5.2.1 to 5.2.9, 5.5, 5.6.1 to 5.6.5, 6.1.1 to 6.1.3,
6.2, 6.4, 6.5, 7.1 to 7.4

Reference Books:

1. James F.Kurose, Keith W.Ross, "Computer Networking", Third Edition, Pearson Education.
2. Behrouz A Forouzan, "Data Communications and Networking", Fourth Edition, TMH (2007).
3. Michael A. Gallo, William M. Hancock, "Computer Communications and Networking Technologies", Cengage Learning (2008)

MCA 303 : Operations Research

UNIT I:

Linear Programming: Introduction, formulation of Linear Programming Models, Graphic solution of Linear programming Models, Maximization with Less-than-or-equal to constraints, equalities and Greater than or equal to constraints, Minimization of the objective function, the simplex Method, properties of simplex Method, transportation problem, Assignment Problem.

UNIT II:

Deterministic inventory Models: Introduction, Infinite Delivery Rate with No Backordering, Finite delivery Rate with no Backordering, Infinite Delivery Rate with Backordering, finite Delivery rate with Backordering.

UNIT III:

Game Theory: Introduction, Minimax -Maxmini pure strategies, Mixed Strategies and Expected Payoff, solution of 2x2 games, dominance, solution of 2xn games, solution of mx2 games, Brown's algorithm

UNIT IV:

PERT: Introduction, PERT Network, Time Estimates for Activities(ET), Earliest Expected completion of events(TE), Latest Allowable Event Completion time(TL), Event Slack Times(SE),Critical path

Prescribed book:

Belly E. Gillett, "Introduction to Operations Research - A computer-oriented algorithmic approach", TMH (2008).

Chapters: 3.2 to 3.7, 3.10 to 3.12, 6.1 to 6.5, 11.1 to 11.4,
11.6 to 11.9, 12.1 to 12.7

Reference Book:

J K Sharma, "Operation Research theory and applications",
Third edition, MACMILLAN

MCA 304: Computer Graphics

Unit-I

Overview of Computer Graphics: Video Display Devices, Raster Scan Displays, Random Scan Displays, Color CRT Monitors, Direct View Storage Tubes, Flat Panel Displays, Raster Scan Systems, Random Scan Systems, Input Devices.

Graphical User Interfaces and Interactive Input Methods: The User Dialogue, Windows and Icons, Input of Graphical Data, Input Functions

Unit-II

Output Primitives: Points and Lines, Line-Drawing Algorithms: DDA Algorithm, Bresenham's Line Algorithm, Line Function, Circle Generation Algorithms, Ellipse Generation Algorithms

Attributes of output Primitives: Line Attributes, Color and GrayScale levels, Area Fill Attributes, Character Attributes, Bundled Attributes, Antialiasing.

Unit-III

Two Dimensional Geometric Transformations: Basic Transformations, Matrix Representation and Homogenous Coordinates, Composite Transformations, Other Transformations.

Two Dimensional Viewing: The Viewing pipeline, Viewing Coordinates Reference Frame, Window to Viewport Coordinate Transformations, Two Dimensional Viewing Functions, Clipping Operations, Point Clipping, Line Clipping: Cohen-Sutherland Line Clipping, Polygon Clipping: Sutherland-Hodgeman Polygon Clipping, Curve Clipping, Text Clipping, Exterior Clipping.

Unit-IV

Three Dimensional Concepts: Three Dimensional Display Methods.

Three Dimensional Object Representations: Polygon Surfaces, Quadric Surfaces, Superquadrics.

Three Dimensional Geometric and Modeling Transformations: Translation, Rotation, Scaling, Other Transformations, Composite Transformations, Three Dimensional Transformation Functions.

Three Dimensional Viewing: Viewing pipeline, Viewing Coordinates, Projections, Clipping

Prescribed Book:

Donald Hearn, M. Pauline Baker, "Computer Graphics", Second Edition, Pearson Education (2004)

Chapters : 2.1 to 2.5, 8.1 to 8.3, 3.1, 3.2, 3.4 to 3.6, 4,
5.1 to 5.4, 6, 9.1, 10.1, 10.3, 10.4, 11, 12.1, 12.2,
12.3, 12.5

Reference Book:

1. Shalini Govil-Pai, "Principles of Computer Graphics – Theory and Practice using open GL and Maya", Springer (2007)
2. ISRD group, "Computer Graphics", ace series, TMH (2006)
3. Amearendra N. Sinha, Arun D Udai, "Computer Graphics", TMH (2008)

MCA-305: Artificial Intelligence

Unit-I :

What is AI? : The AI Problems, The Underlying Assumption, What is AI Technique?, The level of the Model, Criteria for Success.

Problems, Problem spaces & Search: Defining the Problem as a State Space Search, Production Systems, Problem Characteristics, Production System Characteristics, Issues in the design of Search Programs, Additional Problems.

Heuristic search techniques: Generate and Test, Hill Climbing, Best First Search, Problem Reduction, Constraint Satisfaction, Means Ends Analysis.

Unit-II :

Knowledge Representation Issues: Representations and Mappings, Approaches to Knowledge Representation, Issues in Knowledge Representation, The Frame Problem

Using Predicate Logic: Representing Simple Facts in Logic, Representing Instance and Isa Relationships, Computable Functions and Predicates, Resolution, Natural Deduction

Representing knowledge using Rules: Procedural versus Declarative Knowledge, Logic Programming, Forward versus Backward Reasoning, Matching, Control Knowledge

Unit-III :

Symbolic Reasoning under Uncertainty: Introduction to Nonmonotonic Reasoning, Logics for Nonmonotonic Reasoning, Implementation Issues, Augmenting a Problem Solver, Implementation: Depth-First Search, Implementation: Breadth-First Search

Weak slot & filler Structures: Semantic Nets, Frames

Planning : Overview, An Example Domain : The Blocks World, Components of a Planning System, Goal Stack Planning, Nonlinear Planning Using Constraint Posting, Hierarchical Planning, Reactive Systems, Other Planning Techniques

Unit-IV :

Natural Language Processing: Introduction, Syntactic Processing, Semantic Analysis, Discourse and Pragmatic Processing

Commonsense: Qualitative Physics, Commonsense Ontologies, Memory Organisation, Case-Based Reasoning

Expert Systems: Representing and Using Domain Knowledge, Expert System Shells, Explanation, Knowledge Acquisition

Prescribed Book :

Knight K, "Artificial Intelligence", TMH (1991)

Chapters : 1 through 7, 9, 13, 15, 10 and 20

Reference Book :

1. Michael Negnevitsky, "Artificial Intelligence – A Guide to Intelligent Systems", Second Edition, Pearson Education (2008)
2. Winston P.H, "Artificial Intelligence", Addison Wesley (1993)