Gondwana University, Gadchiroli

Choice Based Credit System (CBCS) Syllabus
Of

Master of Computer Application (MCA)
(Three Years Post Graduate Course)

Prepared by

Dr. S. B. Kishor

2017-2018

Master of Computer Application – II

(Semester III)

MCA II (Semester III)

Subject	Paper Code	Paper Name	Total Period /Week	Credit	IA	UE	Total	Min. Passing (40%)
					\% of Assessment			
Core	PMCAT301	.Net Technologies	4	4	20	80	100	**40**
	PMCAT302	Cyber Law & Intellectual Property Right	4	4	20	80	100	**40**
	PMCAT303	Scripting Languages	4	4	20	80	100	**40**
Discipline Specific Elective (DSE)	PMCAT304.1 PMCAT304.2	**Elective** 1. Operational Techniques 2. Wireless & Mobile Computing	4	4	20	80	100	**40**
Skill Enhancement Elective (SEE)	PMCAT305.1 PMCAT305.2	**Elective** 1. Soft Skills and Personality Development 2. E-Commerce	4	4	20	80	100	**40**
Core Lab	MCAP306	Lab on PMCAT301 & PMCAT302	6	2	50	50	100	**40**
DSC & SEE based Lab	MCAP307	Lab on PMCAT303 & PMCAT304.1	6	2	50	50	100	**40**
Ability Enhancement	PMCAS308	Seminar	1	1	25	-	25	**10**
Total			**33**	**25**	**255**	**470**	**725**	**290**

- **Lab*:**

    1) Not more than two students should be allowed to do practical on one machine.

    2) Wherever possible Practical's should be perform using Open Source Software.

- **Batch:** Each batch can be of Maximum 12 students.

Master of Computer Application – II (Semester III)
Paper Code: PSMCAT301
Paper 1: .NET TECHNOLOGIES

Credit: 4]   **[Max. Marks: 80**

Unit –I: Introduction to .NET

Introduction to .NET Framework, Basic Functionality of CLR, MSIL, About Platform Independency, Why language Interoperability, CTS and CLS, .NET Languages, Assemblies, Garbage Collection, Architecture of GC and Application Domain.

Unit - II : C #.Net

Language Features and Creating .NET Projects, Generating Console Output, Processing Console Input . **Data Types, Expressions and Operators**: Basic Element of Programming (Data types, Variable, Constant, Control Flow Statement),Type Casting, Boxing and Unboxing, Built-in Functions in C#.Net, Sub Programs and Working with Arrays. Namespaces Classes and Inheritance – Introduction, Exploring the Base Class Library , Exploring Assemblies and Namespaces.

Unit -III : Windows Forms and Controls

The Windows Forms Model, Creating Windows Forms, Windows Forms Properties and Events, Windows Form Controls, Menus - Dialogs – ToolTips , Apply Inheritance techniques to Forms, Creating Base Forms, Programming Derived Forms. Debugging and Error Handling

Unit - IV : ADO.Net

Introduction to Access Libraries DAO,RDO,ADO, Limitation of ADO, ADO.Net Objects and Usage, ADO.Net Managed Providers, Data Reader, Data Adapter and DataSet, Data Relation and DataSet, Data Binding, Connected and Disconnected Environments ,Reading and Write Data from database.

Text Books:

1. Christian Nagel, Professional C# .Net, Wrox Publication

2. Matthew Macdonald and Robert Standefer, ASP.NET Complete Reference, TMH

3. Vijay Mukhi, C# The Basics, BPB Publications

References :
1. Andrew Troelsen, "C# and the .NET Platform", A! Press, Year- 2003.

Master of Computer Application – II (Semester III)
Paper Code: PSMCAT302
Paper 2: CYBER LAW & IPR

Credit: 4]   **[Max. Marks: 80**

Unit - I: Principles & Acquisition of IPR

Philosophical Aspects of Intellectual Property Laws, Basic Principles of Patent Law, Patent Application Procedure, Drafting of a Patent Specification, Understanding Copyright Law, Basic Principles of Trade Mark, Basic Principles of Design Rights, International Background of Intellectual Property.

Unit - II: IT related to IPR

Computer Software and Intellectual Property-Objective, Copyright Protection, Reproducing, Defences, Patent Protection.

Domain Name Protection- Objectives, Domain Name and Intellectual Property, Registration of Domain Names, disputes under Intellectual Property Rights, Jurisdictional Issues and International Perspective.

Enforcement of Intellectual Property Rights - Civil Remedies, Criminal Remedies, Border Security measures.

Unit-III: Patents (Ownership and Enforcement of Intellectual Property) :

Patents - Objectives, Rights, Assignments, Defences in case of Infringement. **Copyright -** Objectives, Rights, Transfer of Copyright, work of employment Infringement, Defences for infringement Trademarks-Objectives, Rights, Protection of good will, Infringement, Passing off, Defences. **Designs** - Objectives, Rights, Assignments, Infringements, Defences of Design Infringement.

Unit-IV: Cyber Law & issues related to IPR

Introduction to Cyber Law, Scope of Cyber Laws, Cyber Jurisprudence. Intellectual Property issues in Cyber Space. **Cyber Law Issues for Management:** Cyber Law Issues in E-Business Management, Major issues in Cyber Evidence Management, Cyber Law Compliancy Audit.

Text Books:
1. V. V. Sopale, "Managing Intellectual Property: The Strategic Importance", 2nd Edition, PHI Publication
2. Peter Weill, Jeanne Ross, "IT Governance: How Top Performers Manage IT Decision Rights for Superior Results" 1st Edition, Harvard Business Review Press, June 2004, ISBN-10 1591392535, ISBN -13: 978-1591392538.
3. Caryn R. Leland, "Licensing Art & Design" Allworth Press Publication.

References:
1. Jeanne W. Ross, "Enterprise Architecture as Strategy: Creating a Foundation for Business Execution"
2. Peter Weill "IT Savvy: What Top Executives Must Know to Go from Pain to Gain
3. How To Register Your Own Copyright by Marx Warda, Sphinx Publishing

Master of Computer Application – II (Semester III)
Paper Code: PSMCAT303
Paper 3: SCRIPTING LANGUAGES

Credit: 4]   **[Max. Marks: 80**

Unit – I: HTML and CSS

HTML: Introduction HTML Documents, Basic structure of an HTML document creating an HTML document Mark up Tags, Heading-Paragraphs, Line Breaks, and HTML Tags. Elements of HTML Introduction to elements of HTML- Working with Text, Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia Working with Forms and controls.

CSS:-Creating Style Sheet, CSS Properties, CSS Styling(Background, Text Format, Controlling Fonts) Working with block elements and objects, Working with Lists and Table, CSS Id and Class Box Model(Introduction, Border properties, Padding Properties, Margin properties),CSS Advanced(Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector),CSS Colour Creating page Layout and Site Designs.

Unit – II: XML

Introduction to XML: What is XML, XML verses HTML, XML terminology, XML standards, XML syntax checking, The idea of mark-up, XML Structure, Organizing information in XML, Creating well-formed XML, XML Namespaces. DTD-Introduction to DTD, Document Type Declaration, Element Type Declaration, Attribute Declaration, Conditional Section, Limitations of DTD. **Parsing XML**: Introduction to Parser, Parsing approaches, JAXP, JAXP and SAX, JAXP and DOM., Extensible Style sheet Language (XSL): Introduction to XSL, overview, XPATH, XSLT templates, creating elements and attributes, looping and sorting, conditional processing, defining variables.

Unit – III: JAVASCRIPT

Introduction to JavaScript. Basic Syntax. JS Data Types, Control Structures., JS Event, JS object, (JS String function, JS math function, JS date function , JS array function and property)Working with Arrays. The Document Object Model. Events Handling.

Unit – IV: Python Scripting

Python: Introduction to Python language, Using the Python Interpreter, python-syntax, statements, functions, Built-in-functions and Methods, Modules in python, Exception Handling. Integrated Web Applications in Python — Building Small, Efficient Python Web Systems, Web Application Framework. More Control Flow Tools, Data Structures, Input and Output, Classes, Brief Tour of the Standard Library.

Text Books-
1. Beginning CSS: Cascading Style Sheets for Web Design, Wiley India ,author Ian Pouncey, Richard York.
2. HTML 5 in simple steps publication Kogent Learning ,Dreamtech Press
3. Mastering HTML, CSS & Javascript Web Publishing by Laura Lemay (Author), Rafe Colburn (Author), Jennifer Kyrnin (Author), BPB publication
4. Python: The Fundamentals of Python Programming by **Paul Jones**

Master of Computer Application – II (Semester III)
Paper Code: PSMCAT304.1
Elective: OPERATIONAL TECHNIQUES

Credit: 4]   **[Max. Marks: 80**

Unit –I: Introduction to Operational Techniques
Basics of Operational Research: Origin & Development of Operational Research, Definition and Meaning of Operational Research, Different Phases of an Operational Research Study, Scope and Limitations of Operational Research, Mathematical Modelling of Real Life Problem.

Unit-II: Quantitative Techniques
Need, importance, limitations, management decisions a quantitative techniques; Measures of central tendency (Mean, mode median) measures of dispersion (range, mean deviation, standard deviation) Decision Theory: certainty, uncertainty risk, Decision tree: concept and application. Forecasting techniques: Need, importance, methods-Moving averages, regression analysis and trends etc.

Unit –III: Linear programming and Allocation Models
Introduction, requirement applications, formulation, solution by graphical and simplex Allocation Models: Assignment and Transportation problems Project Management: Introduction, network analysis, PERT/CPM method, Resource levelling and smoothing: concept and methodology.

Unit –IV: Inventory Control, Simulation and Queuing
Inventory Control: concept, cost elements, inventory process and graphical representation, EOQ modes, Simulation: Concept, use of random number, use of computers in simulation. Queuing: Introduction, Classification and MM1/FIRO model.

Text Books:
1. J.K. Sharma, "Operation Research Problems and Solutions", Macmillan, ISBN 9781403931511
2. V.K. Kapoor ,"Operation Research" ISBN: 0470112689
3. Panerselvam ,"Operation Research", PHI, ISBN 81-204-1251-6

References:
1. Sancheti & Kapoor, "Business Statics", Sultan Chand & Sons, New Delhi.
2. Kanti Swarup, P.K. Gupta, Man Mohan," Operation Research", Sultan Chand & Sons, ISBN-81-8054-535-0
3. J.K. Sharma , "Quantitative Techniques For Managerial Decision", Macmillan, ISBN: 090195446740

Credit: 4]   **[Max. Marks: 80**

Unit I: Wireless Communication

Wireless Communication, Advantages of Wireless Communication, Antenna , variation pattern, antenna types, antenna gain, propagation modes, Model for wireless digital communication, multiple access technique-SDMA, TDMA, FDMA, CDMA, DAMA, PRMA, MAC/CA, Cellular network organization, operations of cellular system, mobile radio propagation effects, , handoff, power control, sectorization, traffic engineering, Infinite sources, lost calls cleared, grade of service, poison arrival process

Unit II: Introduction of GSM AND GPRS

GSM- Services, system architecture, radio interface, logical channels, protocols, localization and calling, handover, security, GPRS-architecture, Interfaces, Channels, mobility management DECT.

Unit III: IEEE 802.11: LAN-architecture

IEEE 802.11: LAN-architecture, 802.11 a, b and g, protocol architecture, physical layer, MAC layer , MAC management, HIPERLAN-protocol architecture, physical layer, access control sub layer, MAC sub layer. Bluetooth-user scenarios- physical layer, MAC layer.

Unit IV: Mobile Communication & Security Method

Mobile Communication, SMS, Mobile IP, DHCP, Ad hoc networks: Characteristics, Performance issue, routing in mobile host. Wireless sensor network, Mobile transport layer: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective retransmission, transaction oriented TCP. Introduction to WAP.

Text Books:-

1. J. Schiller, "Mobile Communication", Addison , Wiley

2. William Stalling, "Wireless Communication and Network", Pearson Education

3. Upen Dalal," Wireless Communication", Oxford Higher Education

4. Dr. Kamilo Feher, "Wireless Digital communication", PHI

5. William C.Y Lee, "Mobile Communication Design Fundamental" , John Wiley.

Paper Code: PSMCAT305.1
Elective: Soft Skills and Personality Development

Credit: 4]   **[Max. Marks: 80**

UNIT –I: BUSINESS COMMUNICATION: AN INTRODUCTION

Introduction, Role of Communication in Business, Definitions of Communications, Purpose of Communications, Communication Situation.
INTRODUCTION TO SOUND SYSTEM OF ENGLISH: Introduction, The sounds of English-vowel sound, consonant sound, Organs of Speech.
EFFECTIVE BUSINESS WRITING: THE WHITE PAPER: Guidelines for a Business Article, Writing Plan, Writing Process, Introduction to the Article and Things to avoid.

UNIT-II: NON VERBAL COMMUNICATION

Importance, First Impression, Posture, Clothing , Gestures , Adapters , Symbolic , Conversational , Distance , Eye Contact , Across Culture , Display of Emotions , Non Verbal Actions , Movement and Body Positions - kinesics .
SELF CONCEPT: History, Academic Self Concept - Existential Self, Categorical Self. A positive Self Talk, Reality Check, Use of Humor.
SELF IMAGE AND SELF- ESTEEM: Meaning, Poor vs. Healthy Self Esteem, Inner Voice , Steps to Improve Self Esteem - Rebut the Inner Critic , Practice Self Compassion

UNIT-III: BUILDING SELF CONFIDENCE

Introduction, Self- Esteem , Depression and Other Illness , Things to Raise Self Esteem , Changing Negative Thoughts to Positive .
PERSONAL PLANNING AND SUCCESSES ATTITUDE: Personal Planning , Evaluating Success , Setting Goals , Negative Thoughts , Positive Thoughts , Success Attitude , Optimism Over Pessimism , Optimism Over Cynicism , Interruptions into Opportunities,Teins Pak 8 Positive Attitude foe success and Positive Boss Attitude .
SWOT ANALYSIS: Strengths, Weaknesses, Opportunities, Threats, Master Plans.
MOTIVATION: How to be a Positive Person, Enthusiasm, Difference Between Enthusiasm and Effort , Conducive Conditions for Enthusiasm .

UNIT – IV: ETIQUETTE

Meaning, Good Manners, Speaking Politely, Greeting People, Introductions with Grace, Grooming Appropriately, Writing Thank you Notes.
PUBLIC SPEAKING: Importance of Listening and Responding, 5 steps to Better Listening - Receiving, Understanding, Remembering, Evaluating, Responding. Techniques for writing.
OFFICE ETIQUETTES , E-MAIL ETIQUETTES AND PHONE ETIQUETTES: Most Important Email Etiquette Tips , Work or Office Etiquette , Most Important Office Etiquette Tips, Time Management ,Reasons Why Time Management is Important , Phone Etiquette.
TEAM DYNAMICS: Teamwork , Keys to Successful Teamwork , Benefits of Teamwork , Attitude(Psychology) - Definition , Explicit , Implicit , Function . Conflict - Definition, Conflict Resolution.

BOOKS:

1) Soft skill development by PRASHANT A.DHANWALKAR , S. R. SHARMA, Sai Jyoti Publication.
2) Business correspondence and report writing by R C SHARMA and KRISHNA MOHAN, Tata McGraw Hill.
3) Professional communication skills by PRAVIN BHATIA, S. Chand.

Credit: 4]   **[Max. Marks: 80**

Unit I: Introduction to E-Commerce

Introduction, Applications, Definition of E-Commerce, Goals, Functions, Advantages & Drawback of E-Commerce, Traditional Vs E-Commerce. **EDI:** Introduction, Benefits, Applications, Advantages and Disadvantage, EDI Model, VAS, On-line Payment, Payment Gateways, OTP, Wallet Payment, IMPS, UPI, etc

Unit II: Internet & Extranet

Definition of Internet, Advantages & Disadvantages of the Internet, Component of Intranet Information Technology Structure, Development of an Intranet, Extranet and Intranet Difference, Role of Intranet in B2B Application.

Planning for Electronic Commerce - Planning electronic commerce initiatives, Linking objectives to business strategies, Measuring cost objectives, Comparing benefits to costs, Strategies for developing electronic commerce web sites.

Unit III: EDI, E-Governance & Electronic Payment System

Electronic Data Interchange: Introduction, Concepts of EDI and Limitation, Application of EDI, Disadvantages of EDI, EDI model.

Electronic payment System: Introduction, Types of EPS, Payment types, Traditional payment, Value exchange system, Credit card system, Electronic funds transfer, Paperless bill, Modern payment cash, Electronic cash.

Unit IV: Internet Marketing & E-Governance in India

Internet Marketing: The PROS and CONS of online shopping, The cons of online shopping, Justify an Internet business, Internet marketing techniques, The E-cycle of Internet marketing, Personalisation e – Commerce.

E- Governance for India: E- Governance of India, Indian customer EDI system, Service centre, Imports, Exports.

Text Books -
1. E-Commerce Concepts , Models , Strategies by G.S.V Murthy
2. E-Commerce by Kamlesh K Bajaj and Debjani Nag
3. Electronic Commerce by Gary P. Schneider

Paper Code: PSMCAT306
Practical List

Credit: 2] [Max. Marks: 100

Practical List on .Net Technologies

1. Write a program to accept any character from keyboard and display whether it is vowel or not.

2. Write a program in C#.Net that receives the following information from a set of students:

       Student Id:
       Student Name:
       Course Name:
       Date of Birth:

The application should also display the information of all the students once the data is entered.
Implement this using an Array of Structures.

3. Write a program in C#.Net to accept a number from the user and throw an exception if the number is not an even number.
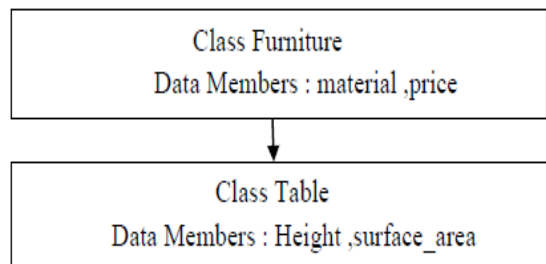
4. Write a program in C#.Net to declare a class 'staff' having data members as name and post. Accept this data for 5 staffs and display names of staff who are HOD.

5. Write a program in C#.Net to declare class 'Distance' have data members dist1,dist2 ,dist3. Initialize the two data members using constructor and store their addition in third data member using function and display addition.
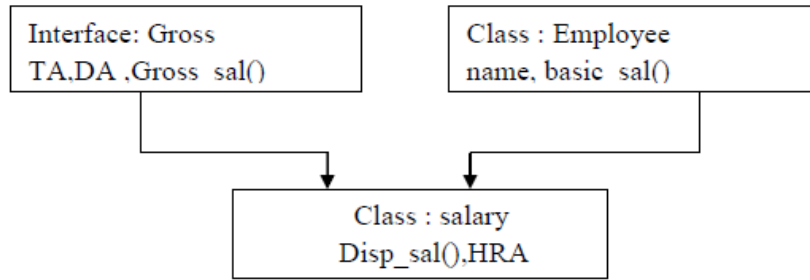
6. Write a program in C#.Net using function overloading to swap two integer numbers and swap two float numbers.

7. Write a program in C#.Net to implement single inheritance from following figure. Accept and display data for one table.

8. Write a program in C#.Net to define a class 'salary' which will contain member variable Basic, TA, DA, HRA. Write a program using Constructor with default values for DA and HRA and calculate the salary of employee.
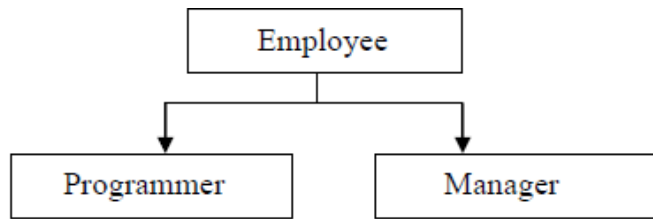
9. Write a program in C#.Net to define a class 'salary' which will contain member variable Basic, TA, DA, HRA. Write a program using Constructor with default values for DA and HRA and calculate the salary of employee.
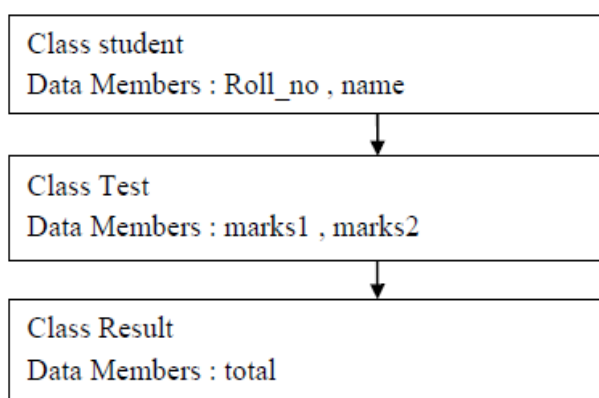
```
┌─────────────────────────┐        ┌─────────────────────────┐
│ Interface: Gross        │        │ Class : Employee        │
│ TA.DA .Gross  sal()     │        │ name, basic  sal()      │
└─────────────────────────┘        └─────────────────────────┘
             │                                  │
             └──────────────┐    ┌──────────────┘
                            ▼    ▼
                  ┌─────────────────────────┐
                  │ Class : salary          │
                  │ Disp_sal(),HRA          │
                  └─────────────────────────┘
```

10. Write a program in C#.Net for given class hierarchy for the Employee where the base class is Employee and derived class and Programmer and Manager. Here make display function virtual which is common for all and which will display information of Programmer and Manager interactively.

```
                  ┌─────────────┐
                  │  Employee   │
                  └─────────────┘
                    │         │
            ┌───────┘         └───────┐
            ▼                         ▼
   ┌─────────────┐            ┌─────────────┐
   │ Programmer  │            │  Manager    │
   └─────────────┘            └─────────────┘
```

11. Write a program in C#.Net to implement multilevel inheritance from following figure. Accept and display data for one student.

```
┌────────────────────────────────────┐
│ Class student                      │
│ Data Members : Roll_no , name      │
└────────────────────────────────────┘
                  │
                  ▼
┌────────────────────────────────────┐
│ Class Test                         │
│ Data Members : marks1 , marks2     │
└────────────────────────────────────┘
                  │
                  ▼
┌────────────────────────────────────┐
│ Class Result                       │
│ Data Members : total               │
└────────────────────────────────────┘
```

12. Write a program in C#.Net to develop a Form in C#.NET to pick a date from Calendar control and display the day, month, and year details in separate text boxes.

13. Develop a C#.Net application using the File, Directory and Directory controls to Implement a common dialog box.

14. Write a program in C#.Net to create a simple customer screen which takes customer name, country, gender, hobby and status. Display a preview screen that will display data entered in to the customer data entry screen.

15. Write a program in C#.Net for Using Try, Catch and Finally blocks to demonstrate error handling.

16. Write a program in C#.Net to demonstrate abstract class and abstract methods.

17. Write a program in C#.Net to demonstrate boxing and Unboxing.

18. Write a program in C#.Net to demonstrate Operator overloading.

19. Write a program in C#.Net to demonstrate Use of Virtual and override key words in C# with a simple program.

20. Write a Program in C# to use the Menustrip control , create two forms One for checking number is palindrome or not and other form for Armstrong number.

21. Consider the Database STUDENT.accdb consisting of following tables: tbl_Course (CourseID: Number, CourseName: Text, CourseFees: Number). Develop suitable windows application using C#.NET having following options:

    1. Entering new course details.
    2. Display the details of course (in a Grid) of a particular course.

21. Consider the Database STUDENT.accdb consisting of following tables: Student (USN: Text, StudName: Text, Address: Text, CourseID: Number, YrOfAdmsn: Number, DateofAdmsn: Date/Time). Develop suitable windows application using C#.NET having following options:

    1. Entering new student details
    2. Display the details of students (in a Grid) who belong to a particular course.
    3. Display the details the students who have taken admission in a particular year.

22. Consider the Database BLOODBANK.accdb consisting of following tables: tbl_BloodGroup (BloodID: Number, BloodGroup: Text). Develop suitable windows application using C#.NET having following options:

    1. Entering Blood group details.
    2. Display the details of BloodGroup (in a Grid) having particular blood group.

24. Consider the Database BLOODBANK.accdb consisting of following tables tbl_Donor (DonorID: Number, DonorName: Text, Address: Text, ContactNo: Number, DOB: Date/Time, Gender: Text, Weight: Number, BloodID: Number). Develop suitable windows application using C#.NET having following options:

    1. Entering new donor details.
    2. Display the details of donors (in a Grid) having particular blood group.
    3. Display the details of donors (in a Grid) based on gender.
    4. Display the details of donors (in a Grid) based on age (above 18), weight (above 45KG) and Gender(user's choice).

25. Consider the Database BLOODBANK.accdb consisting of following tables tbl_Donor (DonorID: Number, DonorName: Text, Address: Text, ContactNo: Number, DOB: Date/Time, Gender: Text, Weight: Number, BloodID: Number). Develop suitable windows application using C#.NET having following options:

    1. Entering new donor details.
    2. Navigate through the records
    3. Search for a particular DonarID.

Master of Computer Application – II (Semester III)
Paper Code: PSMCAT307
Practical List

Credit: 2]   **[Max. Marks: 100**

Practical List on Scripting Languages

1. Create a webpage with HTML describing your department. Use Paragraph and list tags.
   (a) Apply various colors to suitably distinguish key words. Also apply font styling like italics, underline and two other fonts to words you find appropriate. Also use header tags.
   (b) Create links on the words e.g. "Wi-Fi" and "LAN" to link them to Wikipedia pages.
   (c) Insert an image and create a link such that clicking on image takes user to other page.
   (d) Change the background color of the page. At the bottom create a link to take user to the top of the page.
2. Design a web page and apply block & text-level, horizontal rules & special characters tags, set Text color & backgroup color tag.
3. Design a web page to include ordered, unordered and definition lists.
4. Design a web page to include links and set colors for links, active links and visited links.
5. Design a web page to include image with various attributes, set image as a button & background image.
6. Apply in-line CSS to change colors of certain text portion, bold, underline and italics certain words in HTML web page. Also change background color of each paragraph using in-line CSS.
7. Write all styling in CSS in different file (.css) and link it to your webpage such that changes made in CSS file are immediately reflected on the page. Group paragraphs into single class and add styling information to the class in CSS.
8. Create a simple form to submit user imput lik his name, age, address and favourite subject, movie and singer.
9. Add few form elements such as radio buttons, check boxes and password field. Add a submit button at last.
10. Write a JavaScript using control structures and looping.
11. Write a JavaScript for web page using event handlers.
12. Design a web page to incorporate GIF animation.
13. Write a Javascript program to display information box as soon as page loads.
14. Write a JavaScript programs to dynamically bold, italic and underline words and phrases based on user actions.
15. Write a JavaScript program to display a hidden div (e.g. showing stats of a player when user clicks on his name).
16. Add your own XML tags. Revalidate it using validator.
17. Design an XML document to store information about a student in MCA colleges affiliated to Gondwana University, information includes PRN, Name, Name of College, Branch, Year of Joining, and e-mail id.
18. Write a Python Script lines for Loop, built-in enumerate function, new style formatting.
19. Write a Python Script lines for Fibonacci, tuple assignment.
20. Write a Python Script lines for implementing functions.
21. Write a Python Script line for import, regular expressions
22. Write a Python Script lines Command Line arguments using exception handling.

Practical List on Operational Techniques

1. Write a C++ program to calculate Mean.

2. Write a C++ program to calculate Mode.

3. Write a C++ program to calculate Median.

4. Write a C++ program for calculation of standard deviation.

5. Write a C++ program for variance.

6. Write a C++ program for finding a range.

7. Write a C++ program for simulating operation research problems for Student Learning

8. Write down a program in C++ to implement critical path method.

9. Write a C++ program to implement NWCM for solving transportational problem

10. Write a C++ program to implement LCM (Matrix Minima Method) for solving transportational problem.

Master of Computer Application – II

(Semester IV)

MCA II (Semester IV)

Subject	Paper Code	Paper Name	Total Period /Week	Credit	IA	UE	Total	Min. Passing (40%)
Core	PMCAT401	ASP.Net using C#	4	4	20	80	100	40
	PMCAT402	Advance Data Communication	4	4	20	80	100	40
	PMCAT403	Database Administration & Distributred Database	4	4	20	80	100	40
Discipline Specific Elective	PMCAT404.1 PMCAT404.2	Elective 1. Computer Graphics 2. Image Processing	4	4	20	80	100	40
Skill Enhancement	PMCAP405	Project	4	4	20	80	100	40
Core Lab	PMCAP406	Lab on PMCAT401 & PMCAT402	6	2	50	50	100	40
Discipline Specific based Lab	PMCAP407	Lab on PMCAT403 & PMCAT404.1 or PMCAT404.2	6	2	50	50	100	40
Ability Enhancement	PMCAS408	Seminar	1	1	25	-	25	10
Total			33	25	255	470	725	290

(% of Assessment spans IA, UE, Total, Min. Passing columns)

Master of Computer Application – II (Semester IV)
Paper Code: PSMCAT401
Paper 1: ASP.NET using C#

Credit : 4]   **[Max. Marks: 80**

Unit-I: Introduction to ASP.NET 4
Introduction to ASP.NET 4: Microsoft.NET framework, ASP.NET lifecycle. **CSS:** Need of CSS, Introduction to CSS, Working with CSS with visual developer.

Unit-II: ASP.NET Server Controls
ASP.NET server controls: Introduction, How to work with button controls, Textboxes, Labels, checkboxes and radio buttons, list controls and other web server controls, web.config and global.asax files. **Programming ASP.NET web pages**: Introduction, data types and variables, statements, organizing code, object oriented basics.

Unit- III: Validation
Validation Control: Introduction, basic validation controls, validation techniques, using advanced validation controls. **State Management**: Using view state, using session state, using application state, using cookies and URL encoding. **Master Pages**: Creating master pages, content pages, nesting master pages, accessing master page controls from a content page. **Navigation**: Introduction to use the site navigation, using site navigation controls

Unit-IV: Database and Security
Databases: Introduction, using SQL data sources, GridView Control, DetailsView and FormView Controls, ListView and DataPager controls, Using object datasources.
ASP.NET Security: Authentication, Authorization, Impersonation, ASP.NET provider model

Books:
1. Beginning Visual C# 2010, K. Watson, C. Nagel, J.H Padderson, J.D. Reid, M.Skinner, Wrox (Wiley) 2010.
2. Murach's ASP.NET 4 Web Programming with C# 2010, 4th Edition, Anne Boehm, Joel Murach, SPD.
3. Beginning ASP.NET 4 in C# and VB, I. Spanjaars, Reprint 2011

References:
1. ASP.NET 4.0 programming, J. Kanjilal, Tata McGraw-Hill.
2. Programming ASP.NET, D.Esposito, Microsoft Press (Dreamtech), Reprint 2011. ASP.NET.
3. Visual C#.NET, Vijay Nicoel, TMH

Master of Computer Application – II (Semester IV)
Paper Code: PSMCAT402
Paper 2: Advance Data Communication

Credit: 4]   **[Max. Marks: 80**

Unit – I: Data Transmission & Communication

Data Transmission- Concept and Terminology, Analog & Digital Data Transmission, Transmission Impairments. **Signal Encoding**- Digital Data, Analog Data, Digital Signal, Analog Signal. **Digital Data Communication-** Asynchronous & Synchronous Transmission, Types of Errors, Error Detection, Error Correction, Line Configuration. **Data Link Control Protocols-** Flow Control, Error Control. **Multiplexing-** Frequency Division Multiplexing, Synchronous Time Division Multiplexing.

Unit-II: Data Communication Networking

Circuit Switching- Switched Communication Networks, Circuit Switching, Softswitch Architecture. **Packet Switching-** Packet Switching Principles, Switching Techniques, X.25, Routing in Packet-Switching Networks. **LAN-** Topologies and Transmission Media, LAN Protocol Architecture, Medium Access Control, Bridges, Bridge Protocol Architecture, Layer 2 and Layer 3 Switches.

Unit-III: Communication Architecture

Need for Protocol Architecture, TCP/IP Protocol Architecture, OSI Model, Traditional Internet-based Applications. **Internetworking-** Principles of Internetworking, Internet Protocol Operation, Internet Protocol, IPv4 vs IPv6, Connectionless Internetworking Protocol, Router-Level Protocol, and Connection Oriented Internetworking.

Unit- IV: Transport Protocols Network

Basic Protocol Functions, Transport Protocols. **TCP**- TCP Mechanisms, TCP Implementation Policies, - Transport Services, Protocol Mechanism, TCP Congestion Control. **UDP-** Light Weight Transport Protocol. **Session Service and Protocols**- Session Characteristics, OSI Session Service Definition, OSI Session Protocols Definition. **ISDN & Broadband ISDN**- The Integrated Digital Network, Overview of ISDN, Transmission Structure, User Access, ISDN Protocols, Broadband ISDN.

Text Books:

1. William Stalling, "Data and Computer Communication", PHI Publication, "7th Edition", Year-2004, ISBN No- 81-203-2355-6.
2. Forouzan, "Data Communication and Network", Tata McGraw Hill, "2nd Edition", Year- 2003, ISBN No- 07-049935-7.

References:

1. Tanenbaum, "Computer Networks", PHI Publication, "3rd Edition", ISBN No- 0130661023.

Credit: 4]   **[Max. Marks: 80**

Unit – I: ORACLE DATABASE ARCHITECTURE AND ADMINISTRATION

Creating databases, Background processes, Internal database structure, Database file layout, Database space usage overview, Resizing data file. Oracle database architecture, Design, Creation, Migration and Management of Oracle Databases and related database schemes, Data Dictionary views and standard packages, Maintaining the control, Redo Log files, Managing Tablespaces and Data Files, Storage structure and relationships, Managing rollback segment, managing password security and resources, Managing users, Privileges, roles.

UNIT – II : ORACLE BACKUP , RECOVERY AND TUNNING

Backup and recovery considerations, Oracle recovery structure and processes, Oracle backup and recovery configuration, Physical backup, Complete recovery of an Oracle database, Incomplete recovery of an Oracle database with Archiving, Oracle Export / Import utilities, Oracle standby database. **TUNNING** : Oracle performance tuning methodology, Oracle alert and trace files, Tuning the shared pool, Buffer Cache, Redo Log buffer, Database configuration and I/O issues, Using Oracle Blocks efficiently

UNIT – III: INTRODUCTION TO DISTRIBUTED DBMS DESIGN ANDARCHITECTURE

Distributed data processing; Distributed database systems (DDBS); Problems of DDBSs; Completing factors and problem areas.
DBMS standardization; Architectural models for DDBMSs; DDBMS architecture and Global directory issues. Alternative design strategies; Distributed design issues; Fragmentation and allocation.

UNIT- IV: OVERVIEW OF QUERY PROCESSING

Query processing problems; Objectives of query processing; Complexity of relational algebra operators; Characterization of query processors; Layers of query processing

Text Books:
1) Craig S. Mullins, Database Administration: The Complete Guide to Practices and Procedures, Addison-Wesley Professional, 2002.
2) ORACLE DBA Handbook - Oracle Press (Tata McGraw Hill Publication).
3) M. Tamer Ozsu and Patrick Valduriez, "Principles of Distributed Database Systems, 2ND Ed.

References :
1. Silberschatz, Korth, Database System Concepts, McGraw hill, 6th edition, 2010.
2. Thomas Connoly and Carlolyn Begg, Database Systems, A Practical Approach to Design, Implementation and Management, Fourth Edition, Pearson Education 2008.

Master of Computer Application – II (Semester IV)
Paper Code: PSMCAT404.1
Paper 4 Elective: Computer Graphics

Credit : 4] [**Max. Marks: 80**

Unit-I: Geometry, Line Generation and Graphics Primitive
Geometry and Line Generation- Introduction, Points and Lines, Plane and Coordinate, Line Segments, Perpendicular Lines, Vectors, Pixels and Frame Buffers, Vector Generation, Character Generation, Displaying the Frame Buffer. Graphics Primitive- Introduction, Display Devices, Primitive Operations. Polygon- Introduction, Polygons, Polygon Representation, Entering Polygon, Filling Polygon. Transformations- Introduction, Matrices, Scaling Transformation, SIN And COS, Sum of Angles Identifier.

Unit-II: Clipping Techniques
Clipping Techniques- Introduction, Viewing Transformation, Viewing Transformation Implementation, Clipping, Clipping of Polygons, Adding Clipping to the System, Avoiding Division, Generalized Clipping, Position Relative to an Arbitrary Line Multiple Windowing. Interaction- Introduction, Hardware, Input Device Handling Algorithm

Unit- III: 3-Dimension Geometry, Hidden Surface and Lines
3-Dimension Geometry- Introduction, 3D Geometry, Primitives and Transformation, Rotation About an Arbitary Axis, Parallel Projection, Perspective Projection, Viewing Parameters, Conversation to View Plan Coordinate, 3D Viewing Transformation, Special Projection. Hidden Surface and Lines- Introduction, Back Face Removal, Pointers Algorithm, Collection of Polygons, Remembering the Style, Hidden Surface Check.

Unit-IV: Shading and Curves
Shading- Introduction, Diffusion, Illustration, Point-Source Illustration, Specular Reflection, Transparency and Shadows. Curves-Introduction, Curve Generation, Implementation, Interpolating Polygon, B-Splines and Curves.

Books:
1.Donald Hearn, M. Pauline Baker, "Computer Graphics", Prentice Hall Publication, Year- 1994, "2nd Edition".
2. Steven Harrington, "Computer Graphics A Programming Approach", McGraw-Hill International Edition, Year- 1987, ISBN 0-07-026753-7

References:
1. Apurva A. Desai, " Computer Graphics" , Prentice Hall Publication , Year- 2006, ISBN No. 978-81-203-3524-0
2. V. K. Pachghare, "Comprehensive Computer Graphics: Including C++", Laxmi Publications

Credit : 4]   **[Max. Marks: 80**

Unit - I: Digital Image Fundamentals

Digital Image Fundamentals: What is Digital Image Processing. fundamental Steps in Digital Image Processing, Components of an Image processing system, elements of Visual Perception. Image Sensing and Acquisition, Image Sampling and Quantization, Some Basic Relationships between Pixels, Linear and Nonlinear Operations.

Unit - II: Image Transforms

Image Transforms: Two-dimensional orthogonal & unitary transforms, properties of unitary transforms, two dimensional discrete Fourier transform. Discrete cosine transform, sine transform, Hadamard transform, Haar transform, Slant transform, KL transform

Unit - III: Image Enhancement

Image Enhancement: Image Enhancement in Spatial domain, Some Basic Gray Level Trans - formations, Histogram Processing, Enhancement Using Arithmetic/Logic Operations. Basics of Spatial Filtering Image enhancement in the Frequency Domain filters, Smoothing Frequency Domain filters, Sharpening, Frequency Domain filters, homomorphic filtering

Unit - IV: Model of Image Degradation

Model of image degradation/restoration process, noise models, Restoration in the Presence of Noise, Only-Spatial Filtering Periodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invariant Degradations, inverse filtering, minimum mean square error (Weiner) Filtering, Color Fundamentals. Color Models, Pseudo color Image Processing., processing basics of full color image processing

Books:

1.Donald Hearn, M. Pauline Baker, "Computer Graphics", Prentice Hall Publication, Year- 1994, "2nd Edition".

2. Steven Harrington, "Computer Graphics A Programming Approach", McGraw-Hill International Edition, Year- 1987, ISBN 0-07-026753-7

References:

1. Apurva A. Desai, " Computer Graphics" , Prentice Hall Publication , Year- 2006, ISBN No. 978-81-203-3524-0

2. V. K. Pachghare, "Comprehensive Computer Graphics: Including C++", Laxmi Publications

Master of Computer Application – II (Semester IV)
Paper Code: PSMCAT405
Paper 5: Project

Credit: 4]   **[Max. Marks: 100**

Instruction:

Towards the end of the second semester of study, a student will be examined in the course "Project Work".

a. Project Work may be done individually or in groups (Maximum 2 students) in case of bigger projects. However if project is done in groups, each student must be given a responsibility for a distinct module and care should be taken to monitor the progress of individual student.

b. The Project Work should be done using the tools covered in Master of Computer Application

c. The Project Work should be of such a nature that it could prove useful or be relevant from the System-oriented/Application/commercial / management angle.

d. The project work will carry 100 marks.

e. The external viva-voce examination for Project Work would be held as per the Examination Time Table of the second year of study, by a panel of one external and one Internal examiner.

f. Head/Co-ordinator of Computer Dept. must reject any project title which was already carried out in any computer course in the college. It must maintain a Record that lists the projects along with other detail (like Guide, Session, and Number of students working on project etc) that was carried out so far and must be shown to external examiner at the time of examination.

Types of Project

As majority of the students are expected to work out a project in some industry/research and development laboratories/educational institutions/software export companies, it is suggested that the project is to be chosen which should have some direct relevance in day-today activities of the candidates in his/her institution. The Applications Areas of project - Financial/Marketing/Database Management System/ Relational Database Management System/E-Commerce /Internet/ Manufacturing/ web Designing/Hardware and Software interaction based etc.

Project Proposal (Synopsis)

The project proposal should be prepared in consultation with the guide. The project guide must be a person having minimum Qualification MCA/M.Sc.(Computer)/ M.Sc. (Maths/Electronics/Statistics/Physics + Post B.Sc. Dip. In Comp. Sci. & Appl.) The project proposal should clearly state the objectives and environment of the proposed project to be undertaken. It should have full details in the following form:

1. Title of the project
2. Objectives and Hypothesis of the Project
3. Project Category (DBMS/RDBMS/OOPS/Web Designing/Internet etc.)
4. Tools/Platform, Languages to be used
5. A complete Structure of the program:
   i. Analysis.
   ii. Numbers of Modules.
   iii. Data Structures or Tables
   iv. Process Logic.

v.   Types of Report Generation.

6.   Scope of future Application.

Project Report Formulation.
1.   Title Page.
2.   Certificate Page.
3.   Declaration Page.
4.   Acknowledgment Page.
5.   Index or Content Page.
6.   Documentation.
      i.   Introduction/Objectives.
      ii.   Preliminary System Analysis.
             Identification of Need.
             Preliminary Investigation.
             Feasibility Study.
             Need of New System. Flaws
             in Present System.
     iii.   Project Category.
     iv.   Software Requirement Specification. v.
           Detailed System Analysis.
             Data Flow Diagram.
             Numbers of Modules and Process Logic. Data
             Structures and Tables.
             Entity-Relationship Diagram. vi.
         System Design.
             Source Code.
             Input screen & Output Screen. vii
         Validation Checks.
     viii   Implementation, Evaluation and Maintenance. ix
         Security Measures taken.
     x   Future Scope of the project. xi
         Bibliography

Appendix

   o   Survey Questionnaire

Credit: 2]   **[Max. Marks: 100**

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Practical List on ASP.Net using C#

1. Create an application that allows the user to enter a number in the textbox named 'getnum'. Check whether the number in the textbox 'getnum' is palindrome or not. Print the message accordingly in the label control named lbldisplay when the user clicks on the button 'check'.

2. Create an application that allows the user to enter a number in the textbox named 'getnum'. Check whether the number in the textbox 'getnum' is palindrome or not. Print the message accordingly in the label control named lbldisplay when the user clicks on the button 'check'.

3. List of employees is available in listbox. Write an application to add selected or all records from listbox (assume multi-line property of textbox is true).

4. "How is the book Programming in C# ?" Give the user three choice : i)Good ii)Satisfactory iii)Bad. Provide a VOTE button. After user votes, present the result in percentage using labels next to the choices.

5. Create a project that calculates the total of fat, carbohydrate and protein. Allow the user to enter into text boxes. The grams of fat, grams of carbohydrate and grams of protein. Each gram of fat is 9 calories and protein or carbohydrate is 4 calories. Display the total calories of the current food item in a label. Use to other labels to display and accumulated some of calories and the count of items entered. The form food have 3 text boxes for the user to enter the grams for each category include label next to each text box indicating what the user is enter.

6. Set the label border color of rollno to red using css.

7. Set the font-Arial , font style-bond , font size-18px of different controls(ie. Label, textbox, button) using css.

8. Create the application that accepts name, password ,age , email id, and user id. Allthe information entry is compulsory. Password should be reconfirmed. Age should be within 21 to 30. Email id should be valid. User id should have at least a capital letter and digit as well as length should be between 7 and 20 characters.

9. Create a website for a bank and include types of navigation.
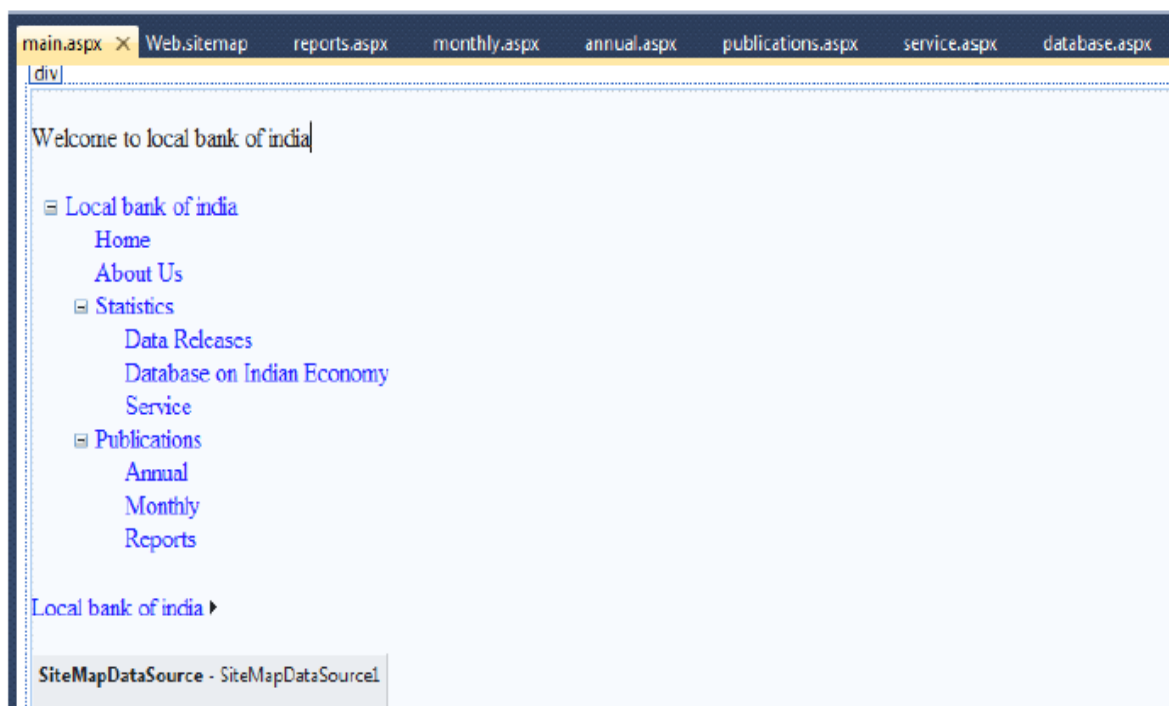
10. Create a Web App to display all the Empname and Deptid of the employee from the database and bind it to GridView . Database fields are(DeptId, DeptName, EmpName, Salary).

11. Create a Login Module which adds Username and Password in the database. Username in the database should be a primary key.

12. Create a web application to insert 3 records inside the SQL database table having following fields(DeptId, DeptName, EmpName, Salary). Update the salary for any one employee and increment it to 15% of the present salary. Perform delete operation on 1 row of the database table.

13. Write a program to get a user input such as the boiling point of water and test it to the appropriate value using CompareValidator.

14. Write a program that uses a textbox for a user input name and validate it for RequiredField Validation.

15. Write a program that gets user input such as the user name, mode of payment, appropriate credit card.After the user enters the appropriate values the Validation button must validates the values entered.

16. Declare one TextBox control, one Button control, one Label control, and one RegularExpressionValidator control in an .aspx file. The submit() function checks if the page is valid. If it is valid, it returns "The page is valid!" in the Label control. If it is not valid, it returns "The page is not valid!" in the Label control. If validation fails, the text "The zip code must be 5 numeric digits!" will be displayed in the RegularExpressionValidator control.

17. Check the length of the string in the TextBox using CustomValidator.

Master of Computer Application – II (Semester IV)
Paper Code: PSMCAT407
Practical List

Credit: 2]   **[Max. Marks: 100**

Practical List on Database Administration and Tuning

1. Installing Database Server, Create Database, Starting and stopping Database instance, network Configuration

2. Managing Table spaces and Data Files

3. Storage Management at table space, Table and user level

4. Managing tables, indexes and constraints: Storing data (create, alter, analyzing, querying table information), Managing indexes, Managing constraint

5. Maintainance of Control file , Redo log file and Data file.

6. User Access and Security: Creating and modifying use accounts, creating and using roles, granting and revoking privileges, Managing user groups with profiles

7. Introduction to performance tuning: brief overview of Tuning methodology, General tuning concepts, Rollback Segments Tuning SQL (e.g. EXPLAIN PLAN Utility of Oracle)

8. Backup and Recovery Overview: Database backup, restoration and recovery, Types of failure in oracle environment, defining a backup and recovery strategy, Testing the backup and recovery plan

9. Monitoring the Database (Tools and Auditing)

10. Database Utility : Bulk Insert, Export/Import

Practical List on Computer Graphics

1. Explain MATLAB's workspace, Save, Load, Clear All functions.

2. Write a program in MATLAB to enter two arrays of any dimension and multiply them after checking the condition.

3. Write a program in MATLAB to enter a date so that program will display the day coming on that date. If first of month is on Wednesday.

4. Write a program in MATLAB to generate the sine wave

5. Write a program in MATLAB to demonstrate the subplots.

6. Write a program in MATLAB to demonstrate the 3-D plot

7. Write a program in MATLAB to create a tree using Huffman's Encoding.

8. Write a program in MATLAB to demonstrate the multidimensional array.

9. Write a program in MATLAB to demonstrate the Data Brushing.

10. Write a program in MATLAB to enter co – ordinate of a point and find its position with respect to co – ordinate system.

11. Write a program in MATLAB to enter two arrays of any dimension and add them after checking the condition.

12. Write a program in MATLAB to enter Cartesian co – ordinate of a point and convert them into equivalent polar coordinates.

13. Write a program in MATLAB to find the transpose of a matrix of 4 * 5

14. Enter the following complex number, $z = 2-j3$ then

   (a) Get the real and the imaginary parts of z

   (b) Get the magnitude and the phase angle of z

   (c) If $y = 3+j5$, calculate the following: y+z, y-z, y×z

15. What is meant by relational and logical operators, write a program to demonstrate each one.

16. The following were the daily maximum temperatures (in F): 58 73 73 53,50 48 56 73 73 66 69 63 74 82 84 91 93 89 91 80 59 69 56 64 63 66 64 74 63,69. Use relational and logical operations to determine the following:

   a) The number of days the temperature was above 75.

   b) The number of days the temperature was between 65 and 80.

   c) The days of the month that the temperature was between 50 and 60.

17. Write a program in MATLAB to Plot, xlabel, ylabel, title, and axis commands.

18. Enter the following matrix,

A =   1 3 4 2

        2 0 1 6

        4 1 2 7

        0 3 6 4

(a) Get the diagonal of the matrix A

(b) Get the sum of each column in the matrix A

19. Enter the following matrix,

A =   1 3 4 2

        2 0 1 6

        4 1 2 7

        0 3 6 4

(a) Get the sum of each row in the matrix A

(b) Get the sum of all elements in the matrix A

20. Enter the following matrix,

A =   1 3 4 2

        2 0 1 6

        4 1 2 7

        0 3 6 4

(a) Add 2 to the element in the 2nd row and 3rd column

(b) multiply 2 to the element in the 2nd.

Practical List on Image Processing

1. Write a program for image enhancement

2. Write a program for image compression

3. Write a matlab function: [*im_q*] = quant(*im*, N) that performs uniform quantization of the image *im* to

  N gray levels (0≤N≤255).

4. Write a program for color image processing

5. Write a program for image segmentation

6. Write a program for image morphology

7. Program for Image Restoration

8. Program for Edge detection

9. Blurring 8 bit color versus monochrome

10. To enhance contrast using Histogram Equalization.

11. To display the Gray scale images.

12. Write a program for mirror image generation