Chhattisgarh Swami Vivekanand Technical University
Bhilai (C.G.)
SCHEME OF TEACHING & EXAMINATION
Master of Computer Applications (MCA) – IIISemester

Sl. No.	Board of Study	Subject Code	SUBJECT	Periods Per Week			SchemeofExam Theory /Practical			Total Marks	Credits L+(T+P)/2
				L	T	P	ESC	CT	TA		
1	Computer Applications	521351(21)	ComputerNetworksand Communication	4	1	0	100	20	20	140	5
2	Applied Maths	521352(14)	ComputerOriented Optimization	4	1	0	100	20	20	140	5
3	Computer Applications	521353(21)	FormalLanguages and AutomataTheory	4	1	0	100	20	20	140	5
4	Computer Applications	521354(21)	Unix OperatingSystem andShell	4	1	0	100	20	20	140	5
5	Computer Applications	521355(21)	ObjectOriented MethodologyandC++	4	1	0	100	20	20	140	5
6	Computer Applications	521361(21)	ProgrammingLabin C++	0	0	4	50	_	25	75	2
7	Computer Applications	521362(21)	Unix lab	0	0	4	75	_	25	100	2
8	Computer Applications	521363(21)	Software Technology Lab III	0	0	5	75	_	25	100	3
9	Humanities	521364 (46)	Report Writing & Seminar	0	0	2	_	_	25	25	1
			TOTAL	20	5	15	700	100	200	1000	33

L: Lecture   **T:**   Tutorial   **P:**   Practical
ESE: End Semester Examination   **CT:**   Class Test   **TA:**   Teacher's Assessment

ChhattisgarhSwamiVivekanandTechnicalUniversity,Bhilai

Name of the programme: **Master of Computer Applications (MCA)**   Semester: **III**
Subject: **Computer Networks & Communication**   Code: **521351 (21)**
Total Theory Periods: **40**   Total Tutorial Periods: **10**

Class Test: **Two (Minimum)**   Assignments: **Two (Minimum)**
Duration of ESE: **Three Hours**   Maximum marks in ESE: **100**   Minimum Marks in ESE: **40**

Course Objectives:
1. To make student know, the network architecture comprising of hardware & software technologies, also to provide the basic knowledge of data communications
2. To make students know, the insight working of network in terms of layered architecture, which includes a set of protocol and its implementation.
3. To make students know, the practical aspect of working of Ethernet in terms of IEEE standards.
4. To make students know, the general principles of network in terms of routing algorithm and Internet architecture and addressing.
5. To make students know, the security aspects in network and implementing it through various methodologies.

Course Outcomes:
a. The students will be able to understand the structure and organization of computer networks; including the division into layers, role of each layer, and relationships between the layers.
b. The students will have basic understanding of Communication techniques and functioning of physical layer.
c. The students will be able to understand the basic concepts of data link layer properties; including the flow control mechanisms.
d. The students will be able to understand the channel structure of ISDN, HDLC and ATM formats.
e. The students will be able to understand the working of IEEE 802 standards with its working prototype.
f. The students will be able to understand the mechanism of dual bus architecture for transmission.
g. The students will have in depth understanding of network layerconcepts and protocol design; including virtual circuit and datagram network designs, routing algorithms, and network interconnections.
h. The students will have in depth understanding of transport layer concepts and protocol design; including connection-oriented and connection-less models
i. The students will be able to understand the basic concepts of application layer protocol design.
j. The students will be able to understand the basic concepts of network security concepts; including authentication, integrity and system security design challenges.

UNIT I **Introduction**: Layered Network Architecture, Review of ISO-OSI Model, Introductionto TCP/IP Model. ;DataCommunication Techniques: Pulse Code Modulation(PCM), Differential Pulse Code Modulation(DPCM),Delta Modulation(DM).; Multiplexing Techniques: Frequency Division, Time Division, Statistical Time Division Multiplexing. Physical Layer: Transmission Media-Wires, Cables, Radio Links, Satellite Link, Fiber Optic; Error Detection And Correction: Single and Burst Error, Parity Check Codes, Cyclic Redundancy Code& Hamming Code.

UNIT II **Data Link Layer Protocols**: Stop and Wait Protocols: Noise free and Noisy channels, performance and efficiency, Sliding Window Protocols: Go Back and Selective Repeat ARQS ,performance and Efficiency, verification of protocol, HDLC :HDLC data link protocol, ISDN, Channel Structure; Asynchronous Transfer Mode(ATM), ATM cells, Header and Cell Formats, Layers in ATM class1,2,3,4,traffic.

UNIT III **Medium Access Control Sublayer:** Concept of Random Access, Pure ALOHA throughput characteristics of ALOHA. Throughputs for finite and infinite populations S-ALOHA.,LAN: IEEE 802.3,802.4 and 802.5 Protocols performance of Ethernet. Token Ring Protocol, FDDI Protocol, Distributed Queue Dual Bus (DQDB)Protocol,

UNIT IV **Network And Transport Layer Protocols:** General Principles, Virtual Circuits and Datagrams, Internetworking using Bridges, Routers and Gateways, Traffic Shaping: Leaky Bucket, Token Bucket, RoutingAlgorithms: Optimality principle, shortest path routing-Dijkstra, Flooding and broadcasting, distance vector routing, linkstaterouting,flowbasedrouting, Multicasting routing flow and congestion control. Internet Architecture and addressing,TransportLayer:Designissues, Quality ofServices, Elementof TCP/IPprotocol:*User*Datagram Protocol, (UDP/TCP) Layering,

UNIT V **Presentation And Application Layer Protocols**: Abstract Syntax notation. 1 (ASN-1).Simple Network Management Protocol (SNMP), Cryptography: Substitution and Transposition, Ciphers, Data Encryption Standard(DES), DES Chaining, BreakingDES, Public keyCryptography, Authentication Protocols, Virtual LAN (VLAN), Virtual Private Network (VPN).

TextBooks:
1. A.S. Tanenbaum"ComputerNetwork:Second Ed. PrenticeHall,India(tan)
2. B.A .Frouzan, DataCommunication ,TataMcGrawHill.

Reference Books:
1. D. BerekasanR. Gallager, "DataNetworks", second Ed. PrenticeHall, India
2. D.E. Coner,"IntertworkingwithTCP/IP", Vol-I.PrenticeHallIndia.
3. G.E. Keiser,"LocalAreaNetworks", McGraw Hill,InternationalEd.
4. W. Stalling, "Data& ComputerCommunications",MaxwellMacmillanInternational Ed.

Name of the Programme: Master of Computer Applications (MCA)   ::::   Duration of the Programme: Three years

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of the programme: **Master of Computer Applications (MCA)**   Semester: **III**
Subject: **Computer Oriented Optimization**   Code: **521352 (14)**
Total Theory Periods: **40**   Total Tutorial Periods: **10**

Class Test: **Two (Minimum)**   Assignments: **Two (Minimum)**
Duration of ESE: **Three Hours**   Maximum marks in ESE: **100**   Minimum Marks in ESE: **40**

Course objectives:
1. To introduce students to allocation model, solve problems involving assignment of jobs to machine, blending, product mix, advertising media selection, least cost diet, distribution, transportation.
2. To make studentsuse the concept of inventory control to determine Economics Order Quantity(E.O.Q) , safety stack ,reorder level, maximum and minimum reorder level.
3. To make students use PERT & CPM in planning, scheduling and controlling construction of dams, bridge , roads, development of production of aircrafts , ships and computer networking
4. To make students present computer oriented algorithm for the most of the method used to solve the well known mathematical model.
5. To make students learn the simulation technique through this paper.

Course Outcomes:
(a) Students will be able to use allocation model, solve problems involving assignment of jobs to machine , blending,product mix, advertising media selection, least cost diet, distribution ,transportation.
(b) Students will be able to use the concept of inventory control to determine Economics Order Quantity(E.O.Q) , safety stack ,reorder level, maximum and minimum reorder level.
(c) students will be able to use PERT & CPM in planning, scheduling and controlling construction of dams, bridge , roads, development of production of aircrafts , ships and computer networking
(d) Students will be able to present computer oriented algorithm for the most of the method used to solve the well known mathematical model.
(e) Students will learn the simulation technique through this paper.

UNIT I   **LINEAR PROGRAMMING** - LP formulations, Graphical method for solving LP with 2 variables, Simplex method, Application of simplex method for maximization and minimization of LP problems, Artificial variable technique for finding the initial basic feasible solution , The Big-M method, Two phase method, Degeneracy in simplex method, Duality theory in LP, Dual simplex method.

UNIT II   **TRANSPORTATION MODEL -** North – West comer rule, Least cost method, Vogel's Approximation method, Modi method, Assignment problem, Dynamic Programming: Basic concepts, Bellman's optimality principle, Dynamic programming approach in decision making , Optimal subdivision problem.

UNIT III   **INVENTORY MODELS -** Introduction to the inventory problem, Deterministic models, The classical EOQ (Economic order quantity) model,Purchasing model with no shortage, Manufacturing model with no shortage, purchasing model with shortage,Manufacturing model with shortage, Inventory models with probabilistic demand.

UNIT IV   **SEQUENCING AND QUEUING THEORY-** Sequencing problem, Johnson's algorithm for processing N-jobs through 2 machine problem, N-jobs through 3 machine problem, 2- job through N machine by graphical method, Characteristics of queuing system- steady state M/M/1, M/M/1K and M/M/C queuing models.

UNIT V   **CPM and PERT -** Arrow network, Time estimates – Earliest expected time, Latest allowable occurrence time and slack, Critical path, Probability of meeting scheduled date of completion of project, Calculation on CPM network, Various floats for activities, Critical Path, Updating project, Operation time cost trade off curve & project time cost trade off curve, selection of schedule based on cost analysis.

Text Books:
1. B.E. Gillet Introduction to Operations Research, A Computer Oriented Algorithmic Approach – Tata McGraw Hill publishing Co. Ltd. New York.
2. P.K. Gupta & D.S. Hira, Operations Research, S. Chand & Co.

Reference Books:

1. J.K. Sharma "Operation Research" Theory and Applications" Mac Millan
2. H.A. Taha, Operations Research – An Introduction, Fifth Edition, Mac Millan publishing Co. Ltd. New York.
3. S.D. Sharma "Operations Research, KedarNath, Ram Nath, Mecrut.
4. KantiSwarup, Operations Research, S. Chand & Sons.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of the programme: **Master of Computer Applications (MCA)**   Semester: **III**
Subject: **Formal languages & Automata Theory**   Code: **521353 (21)**
Total Theory Periods: **40**   Total Tutorial Periods: **10**

Class Test: **Two (Minimum)**   Assignments: **Two (Minimum)**
Duration of ESE: **Three Hours**   Maximum marks in ESE: **100**   Minimum Marks in ESE: **40**

Course Objectives:
1. To introduce concepts of automata theory.
2. To identify different formal language classes and their relationships
3. To design grammars and recognizers for different formal languages
4. To determine the decidability of computational problems

Course Outcomes:
1. The students will be able to understand the concepts of computational madel
2. The students will be able to convert among DFAs, NFAs.
3. The students will be able to identify the grammars and languages based on Chomsky hierarchy.
4. The students will be able to designFA, PDA, TM for the languages.
5. The students will be able to know about decidability and complexity

UNIT I	Alphabet, String and language, Finite state systems, finite automata with Є ꞏmoves, Conversion of NDFA to DFA, Removal of Є ꞏtransition from ꞏNDFA, Two way finite automata, finite automata with output, Mealy & Moore machines, Applications of finite automata, minimization of finite automata.
UNIT II	Chomsky hierarchy, Regular Expression and Language, Properties of Regular languages, Pumping lemma for regular sets, Closure properties of regular sets, Decision algorithms for Regular sets, Myhill-Nerode theorem.
UNIT III	Context free grammars and their properties, derivation tree, simplifying CFG, ambiguity in CFG, Chomsky Normal form, Greibach Normal form, Pumping lemma for CFL, Closure properties of CFL.
UNIT IV	Pushdown automata: Informal description, Definition, Determinism and Non determinism in PDA, Equivalence of PDA's and CFL's. Two way PDA, Concept of Linear Bounded Automata, context sensitive grammars and their equivalence, Turning machine construction, determinism and non-determinism in TM, Multi tape, multi-track TM.
UNIT V	Undecidability, Universal turning machine and an undecidable problem, recursive function theory, Recursively enumerable sets, recursive sets, partial recursive sets, Church's hypothesis, post correspondence problem,Russell's paradox**.**

Text Books:
1. Introduction to Automata Theory Language and Computation, John E. HopcraftandJeffary D. Ullman, Narosa Publication house.
2. Theory of Computer Science, Automata Languages & computation , K.L.P. Mishra, N. Chandrashekharan, PHI, New Delhi.

Reference Books:
1. Introduction to Formal Languages, Automata Theory and Computation, Kamala Krithivasan and Rama. R, Pearson.
2. Theory of Computation,LewishPapadimitra, Prentice hall of India, New Delhi
3. Introduction to Automata Theory Languages and Computation, John E. HopcraftJeffary, D. Ullman and Rajeev Motwani.
4. Introduction to languages and theory of computation, Matin, J.C, McGraw-Hill, 2003
5. Theory of Computsation, Rajesh .K. Shukla, Cenage Learning

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of the programme:	**Master of Computer Applications (MCA)**	Semester:	**III**
Subject:	**Unix Operating System and Shell Programming**	Code:	**521354 (21)**
Total Theory Periods:	**40**	Total Tutorial Periods:	**10**
Class Test:	**Two (Minimum)**	Assignments:	**Two (Minimum)**
Duration of ESE: **Three Hours**	Maximum marks in ESE: **100**	Minimum Marks in ESE:	**40**

Course objectives:
1. To provide the deeper understanding of structure of Unix Operating system.
2. To provide the detail study of basic Unix commands to advanced commands
3. To develop programming strengths of the Unix system through system calls to shell script
4. To provide better understanding of how the kernel works.
5. To provide deeper understanding of how the programs interact with the system so that more efficient and sophisticated coding can be done.

UNIT I **Introduction:** Features of Unix O/S, History of Unix, flavors of Unix, Layered architecture of Unix O/S, Unix file system and its layout(Boot block, Super block, Inode, Data block), concept of Inode , Commands: Basic commands, directory and files related commands, administrative commands, advanced commands, filters, commonly used commands like who, pwd, cd, mkdir, rm, rmdir, ls, mv, ln, chmod, cp, grep, sed, tr, etc. getting started (login/logout) redirection operators, pipe operator.Introduction to vi editor.

UNIT II **Introduction To Shell Scripts &Awk Programming**: Type of Shells: (bourne ,bash, c shell, k shell), Shell meta characters , environment variables, shell variables, Shell scripts, more Shell facilities and Shell Meta characters, Shell Commands, writing and executing shell scripts, taking decisions : *if-then-fi*,*if-then-else-fi*, other forms of *if* , test command, choice making :The Case statement, The for Loop, Conditional Looping: while and until, Awk pattern scanning and processing language, BEGIN and End patterns, Awk arithmetic and variables, built in variable names and operators, arrays, strings.

UNIT III **General Overview of the System:** Architecture of UNIX O/S, System Concepts, Buffer cache: Buffer headers, Structure of the buffer pool, scenarios for retrieval of a buffer, Reading and writing disk Blocks, advantage and disadvantage of buffer cache.

UNIT IV **Internal Representation of Files and System Calls for The System:** Inodes, Algorithms for allocation of incoreinode (iget) , iputalgorithm.structure of regular file , Directories, conversions of a path name to an Inode, Super Block, Inode Assignment to a New File, Allocation of Disk Blocks. OPEN , READ ,WRITE, CLOSE , file and record locking, File creation, Pipes, Dup.

UNIT V **Structures Of Processes And Process Control:** Process States and Transitions, layout of System Memory, Regions and Page Tables, Manipulation of the process address space, The Context of a Process, Sleep and Wakeup, Process Creation/Termination: fork() and exit() system call, SIGNALS.

Text Books:

1. Design of Unix O.S., Maurice Bach, Prentice Hall of India.
2. Advance UNIX by Steven Prata, a Programming Guide, BPB publication, New Delhi.
3. UNIX Concepts and Applications, Sumitabha Das, Tata McGraw Hill.

Reference Books:

1. The UNIX Programming Environment, B.W. Kernighan & R. Pike, Prentice Hall of India, 1995.
2. UNIX and shell programming, Frouzan B.A. &Gilberg R.E., Cengage Learning.
3. UNIX shell programming, YashavantKanetkar, BPB Publications.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of the programme: **Master of Computer Applications (MCA)** Semester: **III**
Subject: **Object Oriented Methodology and C++** Code: **521355 (21)**
Total Theory Periods: **40** Total Tutorial Periods: **10**

Class Test: **Two (Minimum)** Assignments: **Two (Minimum)**
Duration of ESE: **Three Hours** Maximum marks in ESE: **100** Minimum Marks in ESE: **40**

Course Objectives:
1. To gain a better understanding of object-oriented design and program implementation by using object-oriented language features of C++.
2. Understand an object-oriented software development methodology,
3. To use object-oriented modeling techniques and methodologies to produce requirements specification documents.

Course Outcomes:
1. Understand object-oriented programming features in C++,
2. Apply these features to program design and implementation,
3. Gain some practical experience of C++.

UNIT I **Introduction to Object Oriented Concepts:** Data hiding, Encapsulation, Data abstraction, Classes and objects, Scope of a class and its members , Nested Class, Constructors: parameterized constructor, multiple constructor, default constructor, copy constructor, destructor function, passing objects as function arguments, returning objects, array of objects, object pointer, new and delete operators, inline functions.

UNIT II **Polymorphism and Inheritance:** Polymorphism, Function overloading, default arguments, Operator overloading: unary, binary, friend function, Inheritance, Inheritance: Single inheritance, multilevel inheritance, Hierarchical inheritance, Hybrid Inheritance, Multiple inheritance, container classes.

UNIT III **Late binding, Templates and Exception Handling**: Virtual base classes, pointers to base and derived classes, virtual functions, pure virtual functions, virtual base classes, early and late binding, introduction to templates, function and class templates, exception handling.

UNIT IV **Formatting and working with Files**; Formatted I/O with manipulators, formatting with ios class, streams and files, file modes, writing and reading objects on a file, random access of files, updating file.

UNIT V **Object Oriented Analysis and Design:** OOA and OOD, Three models – Object, Dynamic and Functional. Object modeling – objects and classes, links, associations, generalization and inheritance. Dynamic modeling - Events and states, operations, nested state diagrams, concurrency. Functional modeling- functional models, example of functional model, relation of functional to object and dynamic models, OMT methodology.

TextBooks:
1. K.R.Venugopal, Raj Kumar and T.RaviShankar ,Mastering C++, TMH.
2. H. Schildt , C++ Complete reference, , TMH.
3. J.Rumbaugh, M.Blaha et.al, Object - Oriented modeling and design, PHI.

Reference Books:
1. Object Oriented Programming with C++, Balaguruswami:
2. Object Oriented Programming in Turbo C++, Robert Lafore, Galgotia Pub.
3. Object Oriented Analysis and Design, GradyBooch, Pearson.
4. C++ Primer plus, Stephen Prata, Galgotia Pub.
5. The C++ Programming language, BjarneStroustrup, Pearson

ChhattisgarhSwamiVivekanandTechnicalUniversity,Bhilai

Name of program: **Master of Computer Applications (MCA)** Semester: **III**

Subject: **Programming Laboratory in C++** Code: **521361(21)**

Lab Periods/ week: **4** Batch Size: **30**

Maximum Marks: **50** MinimumMarks: **25**

List of experiments:

1. A book shop maintains the inventory of books that one being sold at the shop. He list includes details such as authors, title, price, publisher and stock position. Whenever a customer wants a book, the sales person input the title and author and the system searches the list and displays whether it is available or not. If it is not, an appropriate message is displayed. If it is then the system displays the book details and requests for the number of copies required.
2. Write a program which will show the order of execution of constructor, destructor, static data member, static function and member functions.
3. Create class Distance having private data feet(type integer), inches(type float) and function getdist() and showdist() . Overload + operator to add two distance values and > operator to compare them.
4. Create a class called employee containing protected data name(20 characters), employee number(long integer). Also write its constructor and destructor functions. Create two derived classes called hourly _employee containing private data rate and hours and salary_ employee containing basic salary and allowances as data members. The class employee is inherited as public by these derived classes. Write appropriate functions in each class to calculate total salary of each employee and to display name, number and total salary.
5. Create a class dimension containing three float type data and a constructor to accept values, also declare a pure virtual function area() in it. Now create three derived classes rectangle, square and triangle, each inheriting dimension as public. Define corresponding constructors and redefine virtual function area() in each to give area of respective figure. A main() program should create suitable objects to implement this inheritance.
6. Create a class STRING that contains a character array as a data member. Overload + and = operators respectively to concatenate and compare strings.
7. Create two classes DM and DB respectively represent the distance in meters, centimeters and distance in feet, inches. Write a program that can read values for the class objects and add one object DM with another object of DB. Use a friend function to carry out the addition operation. The object that stores the results may be a DM object or DB object depending on the units in which the results are required. The display should be in the format of feet and inches or meters and centimeters depending on the object on display.
8. Write a program to define a class 2DPoint that represents a point in a 2D plane by its x and y coordinates. The class will contain constructors and member function distance() that can calculate the distance between the point to any other point in the plane. Drive a new class 3DPoint from the class 2DPoint that will add a new member, the z coordinate. Override the function distance() that calculate the distance between two points in the space.
9. Write a program containing a possible exception. Use a try block to throw it and a catch block to handle it properly.
10. Write a program to read the contents of a text file and count the number of words present in the file.
11. Write a program that reads a text file and creates another file that is identical except that every sequence of consecutive blank spaces is replaced by single space.
12. Write a program that will ask the users to enter the details of 5 students and transfer those details into a binary file Stud.dat. Write another file that will read the details of the students and print the names of all those students who have total marks greater that a particular given value.

13. Write a program that will take the details of 10 employees as input and transfer those details into a binary file. Write another program that will provide a menu to the user for the following purpose.
    a. To display the details of all the employees.
    b. To display the details of all employees having total salary greater than a given value.
    c. To sort the file on the basis of their employment number.
    d. To sort the file on the basis of their name.
    e. To update the record for a particular employee.
    f. To delete the record for a particular employee.
    g. To search the record for a particular employee on the basis of their employee number or name.
14. Write a program that will take two strings from the command line as argument and print the appropriate message if both the strings are same.

Students should be able to answer the following questions:

1. Consider the following function prototype with default arguments. Point out any error in it.
    int Sum(int =100, int , int = 200);
2. Explain the concept of function overloading. Discuss the advantages.

Name of the Programme: Master of Computer Applications (MCA)   ::::   Duration of the Programme: Three years

3. Can the following functions be overloaded? If no, why?

> void fun(int , int);
> int fun(int, int);

4. Explain the concept of inline functions. Which functions are best suited to be declared as inline?
5. Explain the difference between macro definitions in C and inline functions in C+.
6. Explain the difference between a C++ class and a C++ structure definition.
7. What do you mean by access specifiers? What are the different access specifiers?
8. Define constructor. What are the features of a constructor?
9. What is the importance of the concept of function overloading in defining constructors of a class?
10. What do you mean by a destructor? Mention the importance of a destructor in a class.
11. What is the importance of friend functions in a class?
12. What do you mean by a friend class? Discuss a situation in which a class F should be declared as a friend class of some class C.
13. What is the use of :: (Scope resolution operator) in C++ ?
14. What do you mean by a static member of a class?
15. Why is it necessary to initialize a static data member of a class outside a class?
16. Compare a static member of a class with the static storage class of a variable defined inside a function.
17. Explain this pointer?
18. What do you mean by a reference variable? Explain the uses of reference variables in C++.
19. Explain the different techniques of passing a parameter in a function in C++.
20. "References work as implicit pointers" comment on this statement with supporting argument.
21. Why cannot we use this pointer inside a static function?
22. What is the use of a copy constructor?
23. Why it is necessary to use call by reference technique to pass parameter in a copy constructor?
24. With the help of example explain the difference between assignment operator and a copy constructor.
25. What is the advantage of overloading any operator?
26. What is the advantage of using a friend function in operator overloading?
27. Which operators cannot be overloaded and why?
28. Explain the concept of inheritance with the help of an example.
29. Explain the concept of multiple inheritance with an example.
30. Explain the concept of multilevel inheritance with an example.
31. Explain the difference between multiple inheritance and hierarchical Inheritance.
32. Explain the concept of virtual base class.
33. Explain the difference between inheritance and containership.
34. Explain the difference between private, protected and public inheritance.
35. Explain the use of protected access specifiers with the base class members in inheritance.
36. What do you mean by function overriding? Explain the need to override a function in the derived class
37. Explain the difference between function overriding and function overloading.
38. What do you mean by the term binding? Explain the difference between static and dynamic binding.
39. Define virtual functions and its advantages.
40. What is the importance of using an abstract class? How can we make a class abstract?
41. What are templates? Discuss the advantage of using a template.
42. Why templates are also called as generics?
43. Explain Standard Template Library (STL) and its uses.
44. What is the syntax to declare a template class?
45. Explain the class hierarchy of the stream classes in C++.
46. Explain the use of eof( ) and open( ) function in file handling .
47. Explain the fstream class along with its constructors and other member functions.
48. Explain the functions used while working with binary files in C++.
49. Explain the use of seekg( ) and seekp( ) functions in file handling programs .

Text Books:
4. Mastering C++,K.R.Venugopal, Raj Kumar and T.RaviShankar, TMH.
5. C++ Complete reference, H. Schildt, TMH.
6. Object - Oriented modeling and design, J.Rumbaugh, M.Blaha et.al, PHI.

Reference Books:
2. Object Oriented Programming with C++, Balaguruswami:
3. Object Oriented Programming in Turbo C++, Robert Lafore, Galgotia Pub.
4. Object Oriented Analysis and Design, GradyBooch, Pearson.
5. C++ Primer plus, Stephen Prata, Galgotia Pub.
6. The C++ Programming language, BjarneStroustrup, Pearson

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Master of Computer Applications (MCA)**   Semester: **III**

Subject: **UNIX Laboratory**   Code: **521362(21)**

Lab Periods/ week: **4**   Batch Size: **30**

Maximum Marks: **50**   MinimumMarks: **25**

List of Experiments:

1) Practice of UNIX Basic commands, directory and files related commands, administrative commands, advanced commands: tr, sed, awk.filters, redirection operators, pipe operator.
2) Working with vi editor.
3) Find the factorial of any number using awk command.
4) Write awk command to count the number of times each word occurs in asorted list that contains one word per line.
5) Consider the data file containing columns: item name ,id, number of item sold and cost per item. Write a shell script to display
      i)   Total no. of item sold
      ii)   Total cost of individual item
      iii)   Total cost of all item
6) Write shell script to display menu for the following
      a. Display file contents with line number
      b. Display the file contents with page break
      c. Quit.
7) Write a shell script for accepting the following information and storing it in file.
      i)   customer name
      ii)   item description
      iii)   quantity
      iv)   rate
   the user should get the facility to enter any number of records.
8) Write menu driven shell script to execute 5 basic command of UNIX.
9) Write shell script to check the no is prime or not.
10) Find greatest among three no. using c-shell script.
11) Write interactive shell script to copy the contents of one file to another.
12) Display the output of ls-l command in user friendly way.
13) Write a shell script to search a word in list of file .Take thefile name as input from command line argument in which one of them will contain words to search and another will contain name of files.
14) Write shell script to check whether the string is-
      i.   vowel
      ii.   'unix' or 'UNIX
      iii.   it is two character long
15) Write shell script to perform following for each file of current directory-
      i.   To delete a file if its extension is .old
      ii.   To copy a file it its extension is .c
      iii.   To move a file it its extension is .txt
      iv.   To display the contents of file if it has read permission
16) Write a shell script to delete one of thefile if two file are similar if not, display proper message. Write shell Script - with command line argument, without command line argument.
17) Write shell script to generate multiple answer type questions.
18) Write a shell script that accepts one or more file names as arguments and converts their contents to uppercase.
19) Write a shell script using set command which uses date that prints the usual date output as default but which has options for printing just the time, just the day-month-year or just the day of week.
20) Write a shell script program to sort the numbers in descending order supplied as command line arguments.

Text Book:
   1. SumitabhaDas ,Unix Concepts and Applications, 4th Ed. Tata McGraw Hill
   2. B.A. Forouzan, Unix and Shell Programming, Cenegage Learning India Private
      Limited

Reference Book:
   1. Y. Kanetkar, Unix Shell programming, BPB Publications

Chhattisgarh Swami Vivekanand Technical University, Bhilai

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Name of program:	**Master of Computer Applications (MCA)**	Semester:	**III**
Subject:	**Software Technology Laboratory - III**	Code:	**521363(21)**
Lab Periods/ week:	**4**	Batch Size:	**30**
Maximum Marks:	**50**	MinimumMarks:	**25**

Course Contents:

HTML - Concepts of Hypertext, Hyperlinks, ASP & HTML Forms.**The usefulness of Style Sheets, Creating Style sheets, Classes and Pseudo Classes, CSS Tags.**Overview of C#, OOPs Concepts with C#, ASP.NET Controls, Applications, Web servers, form controls -server controls, client controls, Validation Controls, .NET architecture, Accessing Data using Data Adapters and Datasets, . Running a web Application, creating a multiform web project, Installation and Configuration of PHP, PHP Conditional Statements, PHP Looping Statements

Experiments to be performed: (minimum 10 experiments)

1. Write a program to display three images in a line. When any one of the images is clicked, it must be displayed below. On clicking the displayed image it must be cleared. The screen must look as in the figure given below
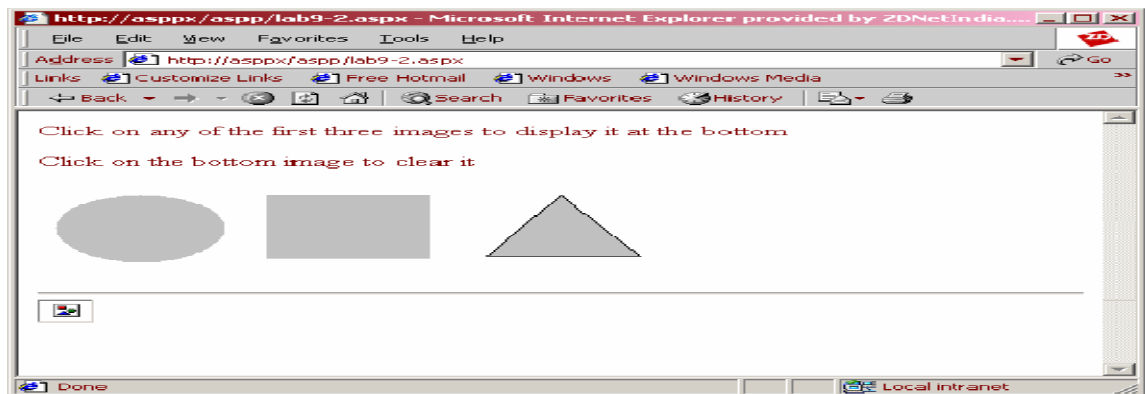
2. Write a program containing the following controls –
   - Two Label
   - A text box
   - A button

   One of the label is displayed adjacent to the textbox ,displaying the message " Enter the quantity " when the user enters the quantity in the textbox and clicks the button the total cost is evaluated and displayed in another label.
3. Write a program to get a user input such as boiling point of water and test it to the appropriate value used compare validator.
4. Create a table which has fields Eno, Ename, and Esal . All of these being retrieved from the Empstable . Each of the above is displayed as a drop down list containing all the values of the corresponding coloumns in the table.
5. Bind a checkbox list to the Pname field of the product table in the master database so   that all the name of the product are displayed as a series of checkboxes.
6. Write a program to implement paging feature in the customer table which has fields CID, CNAME , PLACE, CONTACT as shown in the following figure

CID	CNAME	PLACE	CONTACT
121	JOHN	DELHI	12345
122	MIKE	MUMBAI	54321
1 2 3 4			

7. Create a user control that displays current date /time . Include it in a web form and refresh it each time a button is clicked.
8. Create a user control that contains a list of colors . Add a button to the web form which when clicked changes the color of the form to the color selected from the list.
9. Create a user control that receives a user name and password from the user and validate them. If the user name is SAM and the password is ASP.NET then the user is authorized otherwise not.
10. Write a program that displays a button in green color and it should change in to yellow when the mouse moves over it.

Name of the Programme: Master of Computer Applications (MCA)   ::::   Duration of the Programme: Three years

11. Write a simple PHP page that will display some information onto webpage.
12. Write a PHP script for the following: Design a form to accept a string. Write a function to count the total number of vowels (a,e,i,o,u) from the string. Show the occurrences of each vowel from the string.
13. Write a PHP script for the following: Design a form to accept two numbers from the user. Give options to choose the arithmetic operation (use radio buttons). Display the result on the next form.
14. Write a PHP script for the following: Design a form to accept the details of 5 different items, such as item code, item name, units sold, rate. Display the bill in the tabular format.
15. Write a menu driven program to perform the following operations on an associative array:
    i. Display the elements of an array along with the keys.
    ii. Display the size of an array
    iii. Delete an element from an array from the given index.
    iv. Reverse the order of each element's key-value pair [Hint: use array_flip()]
    v. Traverse the elements in an array in random order [[Hint: use shuffle()].

The students should be able to answer the following questions:

1. What is the basic difference between ASP and ASP.NET?
2. How can we identify that the Page is Post Back?
3. What is Microsoft ADO.NET?
4. List the 4 common ADO.NET Namespaces?
5. What is the difference between DataReader and DataAdapter?
6. Can you inherit from SqlConnection Class?
7. How do you upload a file in ASP.NET ?
8. What is the Differences between ASP and ASP.NET?
9. Explain the differences between Server-side and Clientside code?
10. What is a CLR?
11. What is Difference between Namespace and Assembly?
12. What is a Common Language Specification?
13. What's Thread.Sleep() in threading ?
14. Why do you use the App_Code folder in ASP.NET?
15. What is an ASP.NET Web Form?
16. What is IIS? Why is it used?
17. How can you display all validation messages in one control?
18. Differentiate between client-side and server-side validations in Web pages.
19. What is the difference between HTML and Web server controls?
20. Explain the AdRotator Control.
21. What is the difference between $name and $$name?
22. How can we submit a form without a submit button?
23. What is use of header() function in php ?
24. What are the different types of errors in PHP?
25. How many types of Inheritances used in PHP and how we achieve it
26. How can we register the variables into a session?
27. How can we get second of the current time using date function?
28. How can we know the count/number of elements of an array?
29. What is the difference between the functions unlink and unset?
30. What are the differences between Get and post methods.

Text Books:

1. Roger Jennings ,3.5 Introduction To .Net Framework-Wrox Publication
2. Jason Lengstorf ,Php For Absolute Beginners, Apress, 2009
3. Thomas Powell, HTML & CSS: The Complete Reference, McGraw-Hill Osborne 2010

Reference Books:
1. Kogent Learning Solutions Inc. ,Asp.Net 3.5 Black Book (Covers C# And VB 2008 Codes) - Dreamtech Publication
2. Mathew Macdonald , The Complete Reference Asp.Net S Book Edition 1 - Tmh
3. ImarSpaanjaars ,Professional Asp.Net3.5- Wrox Publication
4. Andrew Curioso , Ronald Bradford ,Patrick Galbraith, Expert Php And Mysql, Wrox Programmer To Programmer, Wrox Press, 2010
5. Kogent Learning Solutions Inc , Web Technologies, Black Book, Dream Tech Press

Name of the Programme: Master of Computer Applications (MCA)   ::::   Duration of the Programme: Three years

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Master of Computer Applications (MCA)**   Semester: **III**

Subject: **Report Writing and Seminar**   Code: **521364(46)**

Lab Periods/ week: 2   Batch Size: **60**

UNIT I   **Introduction to Technical Writing:** how differs from other types of written communication Purpose oftechnical writing, Correspondence: prewriting, writing and rewriting Objectives of Technical Writing.Audience Recognition: High-tech audience, Low tech audience, Lay audience, Multiple Audience.

UNIT II   **Correspondence:** Memos, Letters, E-mails, Its differentiation, types of letters, Document Design, itsimportance, Electronic Communication: Internet, Intranet, extranet, Writing effective e-mail.

UNIT III   **Summary:** Report Strategies, Effective style of technical report writing: Structures: content,introduction, conclusions, references, etc., Presentation, Writing first draft, revising first draft, diagrams,graphs, tables, etc. report lay-out.

UNIT IV   **Report Writing:** Criteria for report writing, Types of Report: Trip report, Progress report, lab report,Feasibility report, project report, incident report, etc. Case Studies.

UNIT V   **Proposals & Presentation:** Title page, Cover letter, Table of Content, list of illustrations, summary,discussion, conclusion, references, glossary, appendix, Case Studies. Oral Presentation/Seminar.

Text Books:
1. Sharon J. Gerson& Steven M. Gerson "Technical Writing - Process& Product", PearsonEducation.

Reference Books:
1. Sunita Mishra, "Communication Skills for Engineers" Pearson Education
2. Davies J.W. "Communication for engineering students", Longman
3. Eisenberg, "Effective Technical Communication", Mc. Graw Hill.