

**Syllabus of
TDC (B.A. / B.Sc. / B.Com.) with Computer Application**

(CHOICE BASED CREDIT SYSTEM)



This is approved in the Academic Council held on 8/11/2019

TDC Program with Computer Application as a regular subject

Program Objectives:

Upon successful completion of a TDC program with Computer Application, students will be able to:

1. Demonstrate proficiency in problem-solving techniques using the computer.
2. Demonstrate proficiency in at least one high-level programming language and one operating system.
3. Demonstrate proficiency in the analysis of complex problems and the synthesis of solutions to those problems.
4. Demonstrate comprehension of modern software engineering principles.
5. Demonstrate a breadth and depth of knowledge in latest Information Technology tools and techniques.

Program Learning Outcomes:

The goals of the computer science department are to prepare students for graduate training in some specialized area of computer science and applications, to prepare students for jobs in industry, business or government, and to provide support courses for students in technology, mathematics and other fields requiring computing skills.

CBCS Course Structure for TDC with Computer Application

SEMESTER WISE PLACEMENT OF THE COURSES

SE ME STE R	CORE COURSE (12)	Ability Enhancement Compulsory Course(AECC)(2)	Skill Enhancement Course (SEC) (4)	Elective: Discipline Specific DSE (6)
I	Fundamentals of Computer Applications (TCA-RC-1016)	ENG-AE-1014		
II	Introduction to Programming in C (TCA-RC-2016)	ENV-AE-2014		
III	Operating System (TCA-RC-3016)		SEC -1 Multimedia Applications (TCA-SE-3014)	
IV	Introduction to Database Management System (TCA-RC-4016)		SEC – 2 (any one) (i) System Administration and Maintenance (TCA-SE-4014) (ii) ICT Hardware (TCA-SE-4024)	
V			SEC – 3 (any one) (i) Web Technology (TCA-SE-5014) (ii) PHP Programming (TCA-SE-5024) (iii) Computer Oriented Financial Accounting (TCA-SE-5034)	DSE – 1A Project Work / Dissertation (TCA-RE-5016)
VI			SEC – 4 (any one) (i) Programming with Python (TCA-SE-6014) (ii) Cyber Law (TCA-SE-6024) (iii) Management Information System (TCA-SE-6034)	DSE – 1B (any one) (i) Programming in Java (TCA-RE-6016) (ii) Computer Networks (TCA-RE-6026) (iii) Software Engineering (TCA-RE-6036) (iv) E-Commerce Technologies (TCA-RE-6046)

Detailed Syllabus

TCA-RC-1016: Fundamentals of Computer Applications

4 Lectures, 4 Practical, Credits 6 (4+2)

Theory: 60 Lectures, Practical: 60 Lectures

End Semester Marks:

Theory: 60 Marks, Practical: 20 Marks

Internal Marks:

Sessional: 10 Marks, Practical: 6 Marks, Attendance: 4 Marks

UNIT 1: Major components of a computer

(10 Lectures)

Block diagram, a brief introduction of CPU, Main Memory, I/O units, RAM, ROM, Keyboard, display, mouse, printers etc. Hardware, Software, Secondary storage devices (hard disks, optical disks, flash memory), backup devices, Bootstrapping, Representation of Information, Number Systems-binary, octal, decimal and hexadecimal, ASCII, EBDIC, BCD Gray code, Unicode, Conversion of bases.

UNIT 2: Algorithms

(10 Lectures)

Concept of algorithm and flow chart, Writing simple algorithms and drawing flow charts for simple problems like finding sum, max, min, average of a list of numbers etc.

UNIT 3: Operating System

(10 Lectures)

Evolution of OS, types of OS, functions of OS, Case study on any OS, [No questions on theory paper will be set on these topics] System features, Software features, File structure, File handling, Installation of OS, Hardware & Software requirements. Computer Networks

UNIT 4: Data communication

(10 Lectures)

Transmission Media- Coaxial, UTP, Optical-Fiber, Wireless, Components of Computer Networks, Types of wireless communication (mobile, WiFi, WiMAX, Bluetooth, Infrared – concept and definition only)

UNIT 5: Internet

(10 Lectures)

Evolution of internet, Basic internet terms(Client, Server, MODEM, Web page, Web site, Home page, Browser, URL, ISP, Web server, Download & Upload, Online & Offline), Internet applications (e-mail, search engines, ftp, VOIP, Video Conferencing, Audio-Video streaming, Chatting).

UNIT 6: Computer Security

(10 Lectures)

Definition, Viruses and Worms, Antivirus, Digital Signature, Software Piracy, Firewall. Hacking and Cracking (basic concepts only for these topics will have to be given).

Practical / Lab work to be performed

A. Office Automation Lab

Introduction to Open Office/MS Office/Libre Office

(N.B: Students have to perform the following experiments and are encouraged to work in the Linux platform)

1. Create a new folder and do the following:
 - Make a word processing document in it.
 - Make a Spreadsheet document in it.
 - Make a new folder in it
 - Rename the initial folder
 - Move the initial folder
 - Copy the initial folder.
 - Delete the initial folder
2. Implement the various well known features of the operating system such as Painting, System tools, Entertainment tools etc.
3. Implement various display properties by right clicking on the Desktop.
4. Explore the taskbar
5. Set the wall paper and screen saver.
6. Set the data/time.

B. Word Processing Tool

1. Create a document and
 - a. Put Bullets and Numbers
 - b. Apply various Font parameters.
 - c. Apply Left, Right, and Centre alignments.
 - d. Apply hyperlinks
 - e. Insert pictures
 - f. Insert ClipArt
 - g. Show the use of WordArt
 - h. Add Borders and Shading
 - i. Show the use of Find and Replace.
 - j. Apply header/footers
2. Create any document and show the use of File→versions.
3. Create any document and show the difference between paste and paste special.
4. Create a document to show the use of Washout/Watermark.
5. Implement the concept of mail merge.
6. Implement the concept of macros.
7. Implement the concept of importing a file/document.
8. Implement the concept of merging the documents.

9. Create a student table and do the following:
 - a. Insert new row and fill data
 - b. Delete any existing row
 - c. Resize rows and columns
 - d. Apply border and shading
 - e. Apply merging/splitting of cells
 - f. Apply sort
 - g. Apply various arithmetic and logical formulas.
10. Create your resume using General Templates.

C. Spreadsheet Tool

1. Create a student worksheet containing roll numbers, names and total marks. Open a document in Word and insert the excel worksheet using:-
 - i) Copy/Paste
 - ii) Embedding
 - iii) Linking
2. The term wise marks for APS class of 20 students are stored in 3 separate sheets named term1, term2 and term3. Create 4th worksheet that contains student names and their total and average marks for the entire year. Give proper headings using headers. Make the column headings bold and italic. The 4th worksheet should contain college name as the first line. Make it bold, italic and center it.
3. Using a simple pendulum, plot 1-T and 1-T² graph.

I	t1	t2	t3	Mean(t)	T=t/20	T²
70						
80						
90						
100						

4. Consider the following employee worksheet:-

Full Name (First Last)	Grade 1/2/3	Basic Salary	HRA	PF	Gross	Net	(VA) Vehicle Allowance

HRA is calculated as follows:

Grade	HRA % (of Basic)
1	40%
2	35%
3	30%

Gross = Basic + HRA + VA

Net = Gross - PF

PF is 8% for all Grades

VA is 15000, 10000 and 7000 for Grades 1, 2 and 3.

- i) Find max, min and average salary of employees in respective Grade
 - ii) Count no. of people where VA>HRA
 - iii) Find out most frequently occurring grade.
 - iv) Extract records where employee name starts with “A” has HRA>10000
 - v) Print Grade wise report of all employees with subtotals of net salary and also grand totals. Use subtotal command.
 - vi) Extract records where Grade is 1 or 2 and salary is between 10000 and 20000 both inclusive.
5. In a meeting of a marketing department of an organization it has been decided that price of selling an item is fixed at Rs40. It was resolved to increase the sell of more of more items and getting the profit of Rs40,000/. Use Goal Seek to find out how many items you will have to sell to meet your profit figure.
6. To study the variation in volume with pressure for a sample of an air at constant temperature by plotting a graph for P – V and P-I/V. Sample observations are:-

Pressure (P)	Volume (V)	I/V	PV	P/V
75	20			
78.9	19			
83.3	18			
88.2	17			

7. Plot the chart for marks obtained by the students (out of 5) vs. frequency (total number of students in class is 50).
8. Create the following worksheet(s) containing a year wise sale figure of five salesmen in Rs.

Salesman	2002	2003	2004	2005
MOHAN	10000	12000	20000	50000
MITRA	15000	18000	50000	60000
SHIKHA	20000	22000	70000	70000
ROHIT	30000	30000	100000	80000
MANGLA	40000	45000	125000	90000

Apply the following Mathematical & Statistical functions:

- i) Calculate the commission for each salesman under the condition :-
 - a) If total sales is greater than Rs. 3, 00,000/-, then commission is 10% of total sale made by the salesman.
 - b) Otherwise, 4% of total sale.
- ii) Calculate the maximum sale made by each salesman.
- iii) Calculate the maximum sale made in each year.
- iv) Calculate the minimum sale made by each salesman.
- v) Calculate the minimum sale made in each year.
- vi) Count the no. of sales persons.
- vii) Calculate the cube of sales made by Mohan in the year 2002.
- viii) Find the difference in sales by salesman Mitra between the year 2002 and 2003.
Find the absolute value of difference.
- ix) Also calculate the Mode, Stddev, Variance, Median for the sale made by each salesman.
- x) Calculate the year wise Correlation coefficient between the sales man Mohan and Mitra year wise

9. The following table gives a year wise sale figure of five salesmen in Rs.

Salesman	2000	2001	2002	2003
S1	10000	12000	20000	50000
S2	15000	18000	50000	60000
S3	20000	22000	70000	70000
S4	30000	30000	100000	80000
S5	40000	45000	125000	90000

- a) Calculate total sale year wise.
- b) Calculate the net sales made by each salesman
- c) Calculate the commission for each salesman under the condition :-
 - a) If total sales is greater than Rs. 4, 00,000/-, then commission is 5% of total sale made by the salesman.
 - b) Otherwise, 2% of total sale.
- d) Calculate the maximum sale made by each salesman.
- e) Calculate the maximum sale made in each year.
- f) Draw a bar graph representing the sale made by each salesman.
- g) Draw a pie graph representing the sale made by salesmen in year 2001.

10. Consider the following worksheet for APS 1st year students:-

S.No.	Name	PH	CH	BY	MT	CS	Total Marks	%	Grade
1									
2									

Grade is calculated as follows:-

- If % ≥ 90 Grade A
- If % ≥ 80 & < 90 Grade B
- If % ≥ 70 & < 80 Grade C
- If % ≥ 60 & < 70 Grade D

Otherwise students will be declared fail.

- i) Calculate Grade using if function
- ii) Sort the data according to total marks
- iii) Apply filter to display the marks of the students having more than 65% marks.
- iv) Draw a pie chart showing % marks scored in each subject by the topper of the class.
- v) Draw the doughnut chart of the data as in (iv)
- vi) Enter the S.No. of a student and find out the Grade of the student using VLOOKUP.
- vii) Extract all records where name
 - a) Begins with "A"
 - b) Contains "A"
 - c) Ends with "A"

D. Presentation Tool

1. Make a presentation of College Education System using
 - a. Blank Presentation
 - b. From Design Template

- c. From Auto Content Wizard
2. Make a presentation on “Wild Life” and apply the following:
- a. Add audio and video effects
 - b. Apply various Color Schemes
 - c. Apply various animation schemes.
 - d. Apply Slide Show

REFERENCE BOOKS

1. Sushila Madan , Introduction to Essential tools,JBA,2009.
2. Anita Goel, Computer Fundamentals, Pearson, 2012
3. Introduction to Information Technology, IITL solutions Ltd, Pearson Education
2. Fundamentals of Computer, V. Rajaraman.
4. P. K. Sinha & Priti Sinha , “Computer Fundamentals”, BPB Publications, 2007.
5. Dr. Anita Goel, Computer Fundamentals, Pearson Education, 2010.
6. T. Budd, Exploring Python, TMH, 1st Ed, 2011
7. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist : learning with Python , Freely available online.2012

TCA-RC-2016: Introduction to Programming in C

4 Lectures, 4 Practical, Credits 6 (4+2)
Theory: 60 Lectures, Practical: 60 Lectures

UNIT 1: Introduction to C

(20 Lectures)

Elementary data types, variables, constants and identifiers, Integer, character floating point and string constants, variable declarations, Syntax and semantics, reserved word, Initialization of variable during declarations Constant data types. Expression in C, precedence and associativity of C operators, unary, binary and ternary operators, C arithmetic operators, assignment operators, relational operators, logical operators and bit –wise operators, L-value and R-value, Side effects of operators, Expression statement, Conditional Statement-if, if-else, switch, Iterative Statement-while, do-while, for, other Statement –break, continue, goto, return, null Statement, block Statement. Function: function declaration, calling a function, Parameters – Call by value, Call by reference and its absence in C. Recursion and how it works, Cast and sizeof operator, Automatic type Conversion

UNIT 2: Arrays and pointers

(20 Lectures)

Storage classes: Automatic, External, Static, Register, Scope and lifetime of variables, Arrays and pointers and corresponding operators, Pointer arithmetic, Programs using arrays and pointers like sum, average, minimum, maximum of an array of numbers, Add and delete an element of an array, Merge two sorted arrays, String manipulation programs like addition, subtraction, multiplication and their combinations, Sum of rows, columns, and diagonal elements of a matrix, Transpose of a matrix, Linear search, binary search. Selection sort and bubble sort.

UNIT 3: Structures and Files

(20 Lectures)

Structure – declaration and use, Structure member resolution and structure pointer member resolution operators, Programs to show the use of structure, Standard C library, Files in C— opening, closing, reading and writing of files, Seeking forward and backward, Simple examples of file handling programs.

Practical / Lab work to be performed

(At least 20 programming assignments have to be done by each student from the following list. The assignments should be selected in such a way that all the features of C language are covered.)

1. Write a program to convert a given temperature value from Fahrenheit scale to Centigrade scale and vice versa.

2. Write a program to display ASCII value of a character.
3. Write a program to check whether a number is perfect or not.
4. Write a program to find out the biggest of three numbers using nested if.
5. A company insures its drivers if either of the following conditions are satisfied
 - Driver is married.
 - Driver is an unmarried, male and above 30 years of age.
 - Driver is unmarried, female and above 25 years of age.

Write a program to decide if a driver is to be insured using logical operators.

6. Write a program to read a list of positive integers terminated by -1 and display the odd and even numbers separately and also their respective counts.
7. Write a program to read values of n and x and print the value of y using switch case where
 - a. $y=n+x$ when $n=1$
 - b. $y=1+x/n$ when $n=2$
 - c. $y= n+3x$ when $n=3$
 - d. $y=1+nx$ when $n>3$ or $n<1$.
8. Write a program to n values of sales and then calculate the commission on sales amount where the commission is calculated as follows:
 - a. If sales \leq Rs.500, commission is 5%.
 - b. If sales > 500 but ≤ 2000 , commission is Rs 35 plus 10% above Rs 500.
 - c. If sales > 2000 but ≤ 5000 , commission is Rs 185 plus 12% above Rs.2000.
 - d. If sales > 5000 ,commission is 12.5%.
9. Write a program to find out minimum, maximum, sum and average of n numbers without using array.
10. Write a program to find out the roots of a quadratic equation. Use proper testing to find checks for real and complex roots.
11. Write a program to print the digits of a number in words. (eg. if a number 841 is entered through the keyboard your program should print “Eight Four One”.)
12. Write a program to print the PASCAL Triangle up to the n-th row where n is an input to the program.
13. Write a function to return the HCF of two positive integers. Write a main function to read two positive integers and print their HCF and LCM by using the above function.
14. Write a program to convert a decimal number into binary number using function.
15. Write a program to display the result of sine series using function.
16. Write a program to find the sum of the following series
 $1+x-x^3/3!+x^5/5!-x^7/7!+ \dots$ corrected up to the 3 decimal place.
17. Write a program to read n numbers in a sorted array and insert a given element in a particular position
18. Write functions to compute the factorial of a number using both recursive and non-recursive procedure.
19. Write a program to print the values of ${}^n C_r$ and ${}^n P_r$ for given positive integers $n \geq r > 0$. Use a function fact(n) to return the factorial of a non-negative integer.n.

$${}^n C_r = n! / r! * (n-r)! \quad {}^n P_r = n! / (n-r)!$$
20. Write a program to display the first n Fibonacci numbers using function.

21. Write a program to display the prime numbers within a given range. Write a function to check whether a given integer is prime or not and use it.
22. Write a program to Multiply two matrices using function
23. Write a program to display the upper Triangle and lower Triangle of a given square matrix using function.
24. Write a function to check if a given square matrix is symmetric or not. Write a main function to implement it.
25. Write a program to read a m X n matrix and calculate the Row sum and Column Sum of the matrix
26. Write a function to read in an integer and print the representation of the number using the sign and magnitude representation scheme using 8 bits. The program should check for overflow/under flow conditions. The left most bit is to be used as the sign bit.
27. Write a program to merge two sorted arrays.
28. Write a program to count the number of vowels in a string.
29. Write a program to concatenate two strings using function (without using library function).
30. Write a program to convert a string from upper case to lower case and vice versa.
31. Write a program to swap two numbers using function (pass the pointers).
32. Write a program to sort n number of strings in ascending order using pointer.
33. Write a program using pointers to copy a string to another string variable (without using library function).
34. Declare a structure of a student with details like roll number, student name and total marks. Using this, declare an array with 50 elements. Write a program to read details of n students and print the list of students who have scored 75 marks and above.
35. Create a structure to store the following information of employees.
 - a. Employee's number, name, pay and date of joining.
 It has been decided to increase the pay as per the following rules:

Pay <= Rs.3000	: 20% increase
Pay <= Rs.6000 but > Rs.3000	: 15% increase
Pay > Rs.6000	: no increase

 Write a program to implement the above structure.
36. Write a program to read a text file and count the number of vowels in the text file.
37. Write a program to copy a text file to another file.

REFERENCE BOOKS

1. B.S. Gottfried, "Programming with C", Tata Mc-Graw Hill.
2. B.W. Kernighan and D.M. Ritchie, "The C Programming Language", PHI
3. Herbert Schild, "The complete reference to C++", Osborn McGraw Hill
4. R. Lafore, "Object Oriented Programming using C++", Galgotia Publications
5. Ian Graham, "Object Oriented Methods", Addison Wesley.
6. E. Balagurusamy, "Programming in ANSI C", Tata McGraw – Hill

TCA-RC-3016: Operating Systems

4 Lectures, 4 Practical, Credits 6 (4+2)

Theory: 60 Lectures, Practical: 60 Lectures

UNIT 1: Introduction (2 Lectures)

System Software, Resource Abstraction, OS strategies

UNIT 2: Types of operating systems (3 Lectures)

Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems

UNIT 3: Operating System Organization (10 Lectures)

Factors in operating system design, basic OS functions, implementation consideration; process modes, methods of requesting system services – system calls and system programs.

UNIT 4: Process Management (15 Lectures)

System view of the process and resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy, Thread model

UNIT 5: Scheduling (15 Lectures)

Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies

UNIT 6: Memory Management (15 Lectures)

Mapping address space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory

Practical / Lab work to be performed

(N.B: Student has to perform *any five* of the following experiments)

1. Write a program to create a child process that starts looping and then terminates.
2. Write a program to show that the child can be set up to ignore a signal from its parent.
3. Write a program to show that a process can ignore a signal.
4. Write a program to create a thread in which prints "We are proud to be Indians" and terminates.
5. Write a program to demonstrate how to "wait" for thread completions by using the P thread join routine. Threads are explicitly created in a joinable state.
6. Write a program to create a thread in which print "We are proud to be Indians" and pass multiple arguments using structure during its creation.
7. Write a program to compute the dot product of two vectors and also show the use of mutex variable.
8. Write a program to implement Banker's Algorithm for multiple resource type each.
9. Write a program to simulate Dining Philosophers Algorithm

REFERENCE BOOKS

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications 2008.
2. A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education 2007.
3. G. Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education 1997.
4. W. Stallings, Operating Systems, Internals & Design Principles, 5th Edition, Prentice Hall of India. 2008.
5. M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill 1992.

TCA-SE-3014: Multimedia Applications

02 Lectures, 04 Practical, Credits 4 (2+2)
Theory: 20 Lectures Practical: 20 Lectures

UNIT 1: Multimedia

(5 Lectures)

Introduction to multimedia, Components, Uses of multimedia

UNIT 2: Making Multimedia

(10 Lectures)

Stages of a multimedia project, Requirements to make good multimedia, Multimedia Hardware - Macintosh and Windows production Platforms, Hardware peripherals - Connections, Memory and storage devices, Multimedia software and Authoring tools.

UNIT 3: Text

(10 Lectures)

Fonts & Faces, Using Text in Multimedia, Font Editing & Design Tools, Hypermedia & Hypertext

UNIT 4: Images

(10 Lectures)

Still Images – Bitmaps, Vector Drawing, 3D Drawing & rendering, Natural Light & Colors, Computerized Colors, Color Palletes, Image File Formats.

UNIT 5: Sound

(10 Lectures)

Digital Audio, MIDI Audio, MIDI vs Digital Audio, Audio File Formats

UNIT 6: Video

(10 Lectures)

How Video Works, Analog Video, Digital Video, Video File Formats, Video Shooting and Editing

UNIT 7: Animation

(5 Lectures)

Principle of Animations, Animation Techniques, Animation File Formats

Practical / Lab work to be performed

Software Lab Based on Multimedia (FLASH as a multimedia S/W):

Practical exercises based on concepts listed in theory using Flash.

FLASH: Concept of Frame, Key frames, Frame rate, Timeline, Tween, Layers, Symbols, Embedding audio/video and embedding on the web page

1. Draw an animation to show a bouncing ball.
2. Draw an animation to show a moving stick man.
3. Draw an animation to show a fainting banana.
4. Draw an animation to show sunrise and sunset.

5. Draw an animation to show a disappearing house.
6. Draw an animation to show two boats sailing in river
7. Draw an animation to show a scene of cricket match.
8. Draw an animation to help teach a poem or a song
9. Draw an animation to show cartoon with a message
10. Make a movie showing Shape Tweening.
11. Make a movie showing Motion Tweening.
12. Add sound and button to the movie

REFERENCE BOOKS

1. Tay Vaughan, "Multimedia: Making it work", TMH, Eighth edition. 2006
2. Ralf Steinmetz and Klara Naharstedt, "Multimedia: Computing, Communications Applications", Pearson, 1995
3. Keyes, "Multimedia Handbook", TMH. 2000
4. K. Andleigh and K. Thakkar, "Multimedia System Design", PHI, 2000

TCA-RC-4016: Introduction to Database Management System

4 Lectures, 4 Practical, Credits 6 (4+2)
Theory: 60 Lectures, Practical: 60 Lectures

UNIT 1: Introduction to Database Management Systems (10 Lectures)

Characteristics of database approach, data models, DBMS architecture and data independence.

UNIT 2: Entity Relationship and Enhanced ER Modeling (15 Lectures)

Entity types, relationships, SQL- 99: Schema Definition, constraints, and object modeling.

UNIT 3: Relational Data Model (15 Lectures)

Basic concepts, relational constraints, relational algebra, SQL queries

UNIT 4: Database Design (20 Lectures)

ER and EER to relational mapping, functional dependencies, normal forms up to third normal form.

Practical / Lab work to be performed

Note: MyAccess/MySQL may be used.

The following concepts must be introduced to the students:

DDL Commands

- Create table, alter table, drop table

DML Commands

- Select , update, delete, insert statements
- Condition specification using Boolean and comparison operators (and, or, not, =, <>, >, <, >=, <=)
- Arithmetic operators and aggregate functions(Count, sum, avg, Min, Max)
- Multiple table queries (join on different and same tables)
- Nested select statements
- Set manipulation using (any, in, contains, all, not in, not contains, exists, not exists, union, intersect, minus, etc.)
- Categorization using group by.....having
- Arranging using order by

7. Retrieve all employees who were born during the 1950s
8. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
9. Retrieve the names of all employees who do not have supervisors
10. Retrieve SSN and department name for all employees
11. Retrieve the name and address of all employees who work for the 'Research' department
12. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birthdate.
13. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
14. Retrieve all combinations of Employee Name and Department Name
15. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan' either as a worker or as a manager of the department that controls the project.
16. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.
17. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.
18. Select the names of employees whose salary does not match with salary of any employee in department 10.
19. Retrieve the name of each employee who has a dependent with the same first name and same sex as the employee.
20. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
21. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. Display with proper headings.
22. Find the sum of the salaries and number of employees of all employees of the 'Marketing' department, as well as the maximum salary, the minimum salary, and the average salary in this department.
23. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
24. For each department, retrieve the department number, the number of employees in the department, and their average salary.
25. For each project, retrieve the project number, the project name, and the number of employees who work on that project.

26. Change the location and controlling department number for all projects having more than 5 employees to 'Bellaire' and 6 respectively.
27. For each department having more than 10 employees, retrieve the department no, no of employees drawing more than 40,000 as salary.
28. Insert a record in Project table which violates referential integrity constraint with respect to Department number. Now remove the violation by making necessary insertion in the Department table.
29. Delete all dependents of employee whose ssn is '123456789'.
30. Delete an employee from Employee table with ssn = '12345'(make sure that this employee has some dependents, is working on some project, is a manager of some department and is supervising some employees). Check and display the cascading effect on Dependent and Works on table. In Department table MGRSSN should be set to default value and in Employee table SUPERSSN should be set to NULL
31. Perform a query using alter command to drop/add field and a constraint in Employee table.

REFERENCE BOOKS

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, Pearson Education, 2010.
2. R. Ramakrishanan, J. Gehrke, Database Management Systems 3rd Edition, McGraw-Hill, 2002
3. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition, McGraw Hill, 2010
4. R. Elmasri, S.B. Navathe Database Systems Models, Languages, Design and Application Programming, 6th Edition, Pearson Education, 2013

TCA-SE-4014: System Administration and Maintenance

02 Lectures, 04 Practical, Credits 4 (2+2)
Theory: 20 Lectures Practical: 20 Lectures

UNIT 1: (Linux/Unix)

(8 Lectures)

Basics of operating system, services,

- Installation and configuration, maintenance
- What is Linux/Unix Operating systems, Kernel, API, cli, gui,
- Difference between Linux/Unix and other operating systems
- Features and Architecture
- Linux features, advantages, disadvantages

UNIT 2: (Windows)

(12 Lectures)

- Windows as operating system, history, versions.
- PC hardware, BIOS, Devices and drivers,
- Kernel Configuration and building
- Application installation, configuration and maintenance
- Server services and Client services
- Difference between Windows XP/windows 7 and windows server 2003/2008

Practical / Lab work to be performed

A. Software Lab Based on System Administration and Maintenance Linux:

Linux Desktop tour, Configuring desktop environment and desktop settings
--

Basic Commands :Terminal, shell,Cat, ls, cd, date, cal, man, echo, pwd, Mkdir, rm, rmdir Ps, kill
--

Package Installation

Synaptic package manager

B. Windows:

<p>Creating users – Admin and regular.</p> <p>Path of their personal files. Adding and changing passwords.</p> <p>Difference between workgroup and domain. Concept of roles.</p> <p>user profiles – creating and roaming Concept of Active Directory. Creating active directory in windows 2003/2008.</p>
<p>Process and Disk management</p> <p>Windows Task manager. File systems – NTFS, FAT.</p>
<p>Services</p> <p>Control Panel</p> <p>C:/program Files, C:/system C:/windows</p> <p>Add /remove new hardware (like printer), Add/remove new programmes.</p>
<p>Network Administration</p> <p>Ipconfig, Ping, tracert, route, hostname, net, netstat, whoami</p> <p>Set manual IP address, check connectivity – ipv4, ipv6</p>
<p>Administrator Tools</p> <p>Control Panel -> Administrative Tools</p> <p>Computer Management, Local security Policy, Performance Monitor, Task Scheduler, Antivirus and firewall.</p>
<p>Misc</p> <p>Start->Accessories->System tools -> All options (Remote desktop, backup/restore etc.)</p> <p>LAN – sharing printer, files and folder over the network.</p>

TCA-SE-4024: ICT Hardware

02 Lectures, 04 Practical, Credits 4 (2+2)
Theory: 20 Lectures Practical: 20 Lectures

UNIT 1

(4 Lectures)

Evolution of computer system, Modern computer, Classification of computer, Personal Computer hardware: Monitor, Keyboard, Mouse, Scanner, printer, speaker

UNIT 2

(4 Lectures)

Hard Disk Drive: logical structure and file system, FAT, NTFS. Hard disk tools: Disk cleanup, error checking, de fragmentation, scanning for virus, formatting, installing additional HDD, New trends in HDD, Floppy Disk Drive

UNIT 3

(4 Lectures)

Optical Media, CDROM, drive speed, buffer, cache, CD-R, CD-RW, DVD ROM, DVD technology, preventive maintenance for DVD and CD drives, New Technologies, Driver installation, Writing and cleaning CD and DVD

UNIT 4

(4 Lectures)

Processor: Intel processor family. Latest trends in processor, Motherboard, Sockets and slots, power connectors, Peripheral connectors. Bus slots, USB, pin connectors. Different kinds of motherboards, RAM, different kinds of RAM, RAM up gradation. Cache and Virtual Memory (only concept will be given without going into implementation details)

UNIT 5

(4 Lectures)

SMPS, BIOS, Network Interface Card, network cabling, I/O Box, Switches, RJ 45 connectors, Patch panel, Patch cord, racks, IP address

Practical / Lab work to be performed

Objectives

The Practical introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like Windows OS, LINUX OS, device drivers. Basic system administration in Linux which includes: Basic Linux commands in bash, Create hard and symbolic links, Text processing, Using wildcards In addition hardware and software level troubleshooting process, tips and tricks would be covered, Different ways of hooking the PC on to the network and internet from home and workplace and effectively usage of the internet, Configuring the TCP/IP setting. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with

the viruses, worms and other cyber attacks would be introduced. The students should perform the following tasks.

Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva.

Task 3: Every student should individually install MS windows on the personal computer. They should learn how to format and partition a hard disk. Lab instructor should verify the installation and follow it up with a Viva.

Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Task 5: Basic commands in Linux

Task 6: Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva

Task 7: Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Task 8: The test consists of various systems with Hardware / Software related troubles, Formatted disks without operating systems. Installation of antivirus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

REFERENCE BOOKS

1. Comdex; Hardware and Networking Course Kit; Dream Tech press
2. PC hardware : A beginners Guide; Ron Gilster, Tata Mc Graw Hill
3. Computer Fundamentals, Anita Goel, Pearson, 2010.
4. Vikas Gupta; Comdex“ Hardware and Networking Course Kit, DreamTech press
5. Ron Gilster, PC hardware: A beginners Guide; Tata McGraw Hill

TCA-SE-5014: Web Technology

02 Lectures, 04 Practical, Credits 4 (2+2)
Theory: 20 Lectures Practical: 20 Lectures

UNIT 1: Web page design **(2 Lectures)**

Designing web pages with HTML- use of tags, hyperlinks, tables, text formatting, graphics & multimedia, image map, frames, forms and Cascading Style Sheet in web pages

UNIT 2: Creating interactive and dynamic web pages with JavaScript **(5 Lectures)**

Client-side scripting languages, JavaScript overview, constants, variables, operators, expressions and statements, user-defined & built-in-functions; properties and methods of built-in objects, client-side form validation

UNIT 3: Extensible Markup Language (XML) **(5 Lectures)**

Introduction to XML, need for XML, advantages, simple XML programs, XML DTDs.

UNIT 4: Web Browsers **(2 Lectures)**

Functions and working principle of web browsers, Web browsers Netscape navigator and IE

UNIT 5: Client/Server Computing **(2 Lectures)**

Client-Server computing basics; types of Client/Server systems; middleware; N-tiered systems: 2-tier/3-tier/4-tier systems; Fat Clients Versus Fat Servers.

UNIT 6: Web Servers **(2 Lectures)**

Functions, architecture of web servers

UNIT 7: Introduction to Server-side scripting **(2 Lectures)**

Overview of CGI, ASP

Practical / Lab work to be performed

(At least 16 assignments has to be done from this group)

1. Create a HTML document consisting of HTML heading, paragraphs and images.
2. Create a HTML document and insert comments in the HTML source code and insert horizontal lines.
3. Construct HTML document to set the font of a text, size of the font, style of the font.
4. Create a HTML document to show how to create hyperlinks.
5. Create a HTML document to use an image as a link.

6. Create a HTML document to open link in a new browser window.
7. Create a HTML document to jump to another part of a document (on the same page).
8. Create a HTML document to insert images from another folder or another server.
9. Create an image-map, with clickable regions.
10. Create a HTML document with all table elements (Table, Caption, Table Row, Table Data element, Table Heading Element, THEAD, TFOOT, TBODY)
11. Create HTML document to make an unordered list, an ordered list, different types of ordered lists, different types of unordered lists, Nested list, Definition list.
12. Create HTML form with the all FORM elements (text fields, password field, Checkboxes, Radio buttons, Select elements, Drop-down list with a pre-selected value, Textarea (a multi-line text input field) and buttons.
13. Create HTML document with all Frame elements (FRAMESET, FRAME, NOFRAMES, and INLINE FRAME).
14. Create a HTML document to add AUDIO and VIDEO.
15. Create a HTML document to aligning images (Let the image float to the left/right of a paragraph)
16. Create a HTML document to jump to a specified section within a frame
17. Construct a HTML document with CSS to Set the background colour of a page.
18. Construct a HTML document with CSS to set an image as the background of a page
19. Construct HTML document with CSS to Set the text color of different elements and align the text.
20. Construct HTML document to set different colours to visited/unvisited links, Specify a background colour for links JavaScript
(At least 10 assignments has to be done from this group)
21. Write a program in JavaScript to accept a name from the user and display the same name in an alert box.
22. Write a program in JavaScript to display a message in a confirm box.
23. Write a program in JavaScript to display the message „time is running out“ in the status bar.
24. Write a program in JavaScript to enter marks of a student and find his/her grade according to the following:
 if marks \geq 90 then grade A
 if marks \geq 80 then grade B
 if marks \geq 70 then grade C
 if marks \geq 60 then grade D
 else fail.
25. Write a program in JavaScript to create a button and when the button is clicked the message ‘Hello World’ is displayed on an alert box.
26. Write a program in JavaScript to accept 2 numbers from the user and show the working of all arithmetic operators.
27. Write a program in JavaScript to accept 2 strings and concatenate them.

28. Write a program in JavaScript to display the current date and time.
 29. Write a program in JavaScript that responds to a mouse click anywhere on the page (using mouse click).
 30. Write a program in JavaScript to display the contents of a check box in a alert box.
 31. Write a program in JavaScript to validate a form containing the fields - user id and password.
- XML
32. Construct a XML document that contains information about products of an organization.
 33. Construct a XML document that contains information of 5 students (such as roll no., name, address, class).
 34. Construct a XML document that contains details of 10 books. ASP
 35. Write a program in ASP to interact with a user in a form that uses the "get" method.
 36. Write a program in ASP to interact with a user in a form that uses the "post" method.
 37. Write a program in ASP to interact with a user in a form with radio buttons.

TCA-SE-5024: PHP Programming

02 Lectures, 04 Practical, Credits 4 (2+2)
Theory: 20 Lectures Practical: 20 Lectures

UNIT 1: Introduction to PHP **(3 Lectures)**

- PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.)
- PHP with other technologies, scope of PHP
- Basic Syntax, PHP variables and constants
- Types of data in PHP , Expressions, scopes of a variable (local, global)
- PHP Operators: Arithmetic, Assignment, Relational, Logical operators, Bitwise, ternary and MOD operator.
- PHP operator Precedence and associativity

UNIT 2: Handling HTML form with PHP **(4 Lectures)**

- Capturing Form Data
- GET and POST form methods
- Dealing with multi value fields
- Redirecting a form after submission

UNIT 3: PHP conditional events and Loops **(3 Lectures)**

- PHP IF Else conditional statements (Nested IF and Else)
- Switch case, while ,For and Do While Loop
- Goto, Break ,Continue and exit

UNIT 4: PHP Functions **(3 Lectures)**

- Function, Need of Function , declaration and calling of a function
- PHP Function with arguments, Default Arguments in Function
- Function argument with call by value, call by reference
- Scope of Function Global and Local

UNIT 5: String Manipulation and Regular Expression **(4 Lectures)**

- Creating and accessing String , Searching & Replacing String
- Formatting, joining and splitting String , String Related Library functions
- Use and advantage of regular expression over inbuilt function
- Use of preg_match(), preg_replace(), preg_split() functions in regular expression

UNIT 6: Array: Anatomy of an Array, Creating index based and Associative array, Accessing array (3 Lectures)

- Looping with Index based array, with associative array using each() and foreach()
- Some useful Library function

Practical / Lab work to be performed

1. Create a PHP page using functions for comparing three integers and print the largest number.
2. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.
3. WAP to check whether the given number is prime or not.
4. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
5. Write a PHP function that checks if a string is all lower case.
6. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)
7. WAP to sort an array.
8. Write a PHP script that removes the whitespaces from a string.
Sample string : 'The quick " " brown fox'
Expected Output: The quick " " brown fox
9. Write a PHP script that finds out the sum of first n odd numbers.
10. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.
11. Write a PHP script that checks if a string contains another string.
12. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.
13. Create a script to construct the following pattern, using nested for loop.

```
      *
     * *
    * * *
   * * * *
  * * * * *
```
14. Write a simple PHP program to check that emails are valid.
15. WAP to print first n even numbers.
16. \$color = array('white', 'green', 'red')
Write a PHP script which will display the colors in the following way :
Output :

white, green, red,

- green
- red
- white

17. Using switch case and dropdown list display a “Hello” message depending on the language selected in drop down list.
18. Write a PHP program to print Fibonacci series using recursion.
19. Write a PHP script to replace the first 'the' of the following string with 'That'.
Sample: 'the quick brown fox jumps over the lazy dog.'
Expected Result: That quick brown fox jumps over the lazy dog.

TCA-SE-5034: Computer Oriented Financial Accounting

02 Lectures, 04 Practical, Credits 4 (2+2)
Theory: 20 Lectures Practical: 20 Lectures

UNIT 1: (6 Lectures)

Meaning of Accountancy, Generally Accepted Accounting Principles (GAAP), Transaction, Rules of Debit and Credit, journal, Ledger, Trial Balance, Balance Sheet, Accounting Standard

UNIT 2: (6 Lectures)

Role of Computer in Financial Accounting, Management Accounting and Cost Accounting, Accounting Information System, IT and Online accounting, Differences between manual Accounting and Computerized Accounting

UNIT 3: (8 Lectures)

Introduction to Accounting Packages, TALLY, TALLY ERP- Features and configuration, Preparation of Ledger Account and Groups, Voucher types and their entry, Maintenance of Accounting Books, Final Accounts, Generation of Financial Reports, Preparation of Accounting Reports, Day Book Summaries, Report Printing, TDS.

Practical / Lab work to be performed

1. Create Multiple Ledger of the following Account Heads:

Bank Charges ; Salary ; Bonus Paid ; Business Promotion Expenses ; Commission Paid ; Conveyance ; Depreciation on Air Conditioner ; Depreciation on Building ; Depreciation on Computers ; Depreciation on Furniture & Fixtures ; Depreciation on Motor Car ; Depreciation on Plant & Machinery ; Discount ; Donation ; Electricity Charges ; Employers Contribution to Provident Fund ; Freight Outward ; Insurance Premium ; Interest Due ; Interest & Finance Charge ; Interest on Bank Overdraft ; Interest on Partner's Capital A/c ; Interest on Unsecured Loans ; Legal Fees ; Miscellaneous Expenses ; Office Rent ; Office Repairs & Maintenance ; Printing & Stationery ; Rent ; Rent Due ; Travelling Expenses .

2) Prepare a Trading and P & L A/C and Balance sheet by creating a company using TALLY from the following information-

- 1) April 1 2010: Started business with cash Rs. 10,00,000.00
- 2) April 2 2010: Brought furniture worth Rs. 20,000.00
- 3) April 3 2010: Deposited into bank Rs. 8,00,000.00
- 4) April 6 2010: Brought goods in cash Rs. 1,00,000.00
- 5) April 8 2010: Brought goods worth Rs. 12,00,000.00 from Ram Trading on credit
- 6) April 9 2010: Brought goods worth Rs. 5,00,000.00 from Shyam Trading on credit
- 7) April 10 2010: Paid Rs. 2, 00,000.00 to Ram Trading from bank account.

- 8) April 14 2010: Sold goods worth Rs. 15,00,000.00 to Pradip & Co. and received Rs 5,00,000.00 in cash from them.
- 9) April 19 2010: Deposited Rs. 3,00,000.00 to the bank account.
- 10) April 25 2010: Sold goods to Hari Brothers worth Rs. 7,00,000.00
- 11) April 26 2010: Postage expenditure paid Rs. 700.00
- 12) April 26 2010: Office general expanses Rs. 4,000.00
- 13) April 28 2010: Bank charges Rs. 800.00
- 14) April 1 2010: Paid for rent Rs. 8000.00
- 15) April 1 2010: Paid salary to staff Rs. 15,000.00

3. Make necessary entries in Tally in the books of Galaxy Enterprise:

- (a) Introduced Cash Rs 10,00,000 , Furniture worth Rs1,00,000 , Computer worth Rs 86,000 , Machinery Rs 1,20,000 into the business on 1st Jan,2010
- (b) Opened a Current A/c with Bank of Baroda with Rs 1,00,000 on 2nd Jan'2011
- (c) Purchased goods on 6th Jan'2010 from Sridhar Stores on credit Rs 2,25,000
- (d) Sold goods for Cash Rs 1,20,000 to Maitree Stores on 7th Jan,2010
- (e) Sold goods to Sankar on credit for Rs 34,000 on 9th Jan'2010
- (f) Paid Rent advance Rs 25,000 by Cheque No 345671 on 10th Jan'2010
- (g) Withdrew from bank Rs 5,000 for office expenses on 18th Jan'2010
- (h) Purchased stationery items on 22nd Jan'2010 for office use from Radhika Stationeries Rs 1,500
- (i) Received Advance from Jagat for supply of goods worth Rs 12,000
- (k) Paid salary to office staff Rs10,000 by Cheque 345672 on 31st Jan, 2010

4. Prepare a Cash Book from the books of ABC Enterprise:

- (a) Cash Balance on 1st April 2010 Rs 4,00,000 (b) Opened a Current Account with UCO Bank on 5th April , 2010 with Rs16,000 (c) Purchased goods for Cash Rs 2,50,000 on 6th April , 2010 (d) Sold goods for Cash Rs 1,25,000 on 8th April , 2010 (e) Paid for Travelling Expenses Rs 2,300 on 10th April , 2010 (f) Paid for Staff Welfare Rs 1,200 on 16th April , 2010 (g) Introduced Additional Capital Rs 50,000 on 20th April , 2010 (h) Withdrew from Bank for Office Cash Rs 2,000 on 27th April , 2010 (i) Sold goods for Rs 65,000 on 28th April , 2010 and payment received by Cheque 15,000 and balance in Cash

5. Make Data Entries for the following transactions:

- (a) Withdrew Rs 1,00,000 cash from SBI on 6th Jan ,2011
- (b) Deposited Rs 40,000 in HDFC Bank on 9th Jan'2011
- (c) Transferred Rs 20,000 from HDFC Bank to SBI on 12th Jan'2011
- (d) Paid Rs 4,300 as Insurance charges through HDFC Bank on 18th Jan'2011
- (e) Received Rs 3,25,000 from ABC Co. Ltd. On 23rd Jan'2011 against our sales through Cheque and it has been deposited in SBI
- (f) Sales worth Rs 5,50,000 made on credit to Vikas Group on 29th jan,2011
- (g) Provision towards Employers PF Contribution Rs 78,000 made on 31st jan,2011

(h) Purchased Machinery Rs 1,00,000 from Sunder Enterprise (INPUT VAT 12.5%)

6. Enter the following transactions in Tally in the books of Computer Solutions:

(a) Purchased on 8th April'2009 HCL Celeron 15 Nos @ Rs 14,000 ; HCL PIV 15 Nos @ Rs 21,000 from Next Generation Systems (Input VAT @ 4%)

(b) Sold on 10th April , 2009 to Fortune Computer Services 10 Nos HP Laserjet Series 1010 @ Rs 12,000 (Output VAT @ 12.5%)

(c) Received from Fortune Computer Services Rs 80,000 on 25th April'2009

(d) Paid to Next Generation System Rs 2,00,000 vide Cheque No 357602 of HDFC Bank

7. Prepare a Double Column Cash Book from the following transactions of XY Ltd:

(a) On 1st Jan, 2010 Cash in Hand Rs 5,00,000 and Cash at SBI Rs 2,30,000

(b) On 4th Jan, 2010 Goods purchased for cash Rs 1,24,000

(c) On 8th Jan, 2010 Goods sold for cash Rs 2,25,000

(d) Deposited into SBI an amount of Rs 1,10,500

(e) Paid rent to landlord Rs 24,000 by Cheque no 234675

(f) Withdrew from SBI Rs 30,000 for purchase of Furniture

(g) Received payment of Rs 30,000 from Amit Kothari, a customer by Cheque

(h) Withdrew from SBI Rs 23,000 for office cash

8. Make relevant Voucher Entries from the following transactions:

(a) On 1st April, 2010 India Infotech received a Bill (vide No. 001) from Pheonix Agencies for Rs. 5,00,000 towards the Advertisement services rendered. (b) On April 8, 2010, payment of Rs. 4,95,000 is made towards bill no. Bill-001 to Pheonix Agencies for the purchase of Advertisement services, vide cheque no. 254781 (c) On May 6, 2010, Universal Infotech, paid TDS of Rs. 5,000 towards Advertisement Expenses, vide cheque no. 056330 for the month of April, 2010.

9. Show how you would deal with the following Bills in Tally:

(a) On 7th May, 2010, India Infotech received a bill (vide no. 911) from Gautam Bishnu & Associates for Rs. 1,12,360 inclusive of other charges of Rs. 12,360 towards the auditing services provided(TDS Rs10,000)

(b) On 8th May, 2010 India Infotech received a bill (vide No. 696) from Digitech Computers for Rs. 25,000 towards commission charges.

(c) On 12th May, 2010 India Infotech received a bill (vide No. 874) from Digitech Computers for Rs. 40,000 towards commission charges.

(d) On 14th May, 2010 India Infotech deducted tax Rs 2,500 towards Commission Expenses for the transaction dated 8th May and Rs 4,000 towards transaction dated 12th May.

10. BX Ltd purchased a machinery for Rs 5,00,000. To use this machine company requires a platform, pipe connections, electrical connections, fabrication works etc. at the cost of Rs. 1,00,000. On the

expense of Rs. 1,00,000 tax to be deducted at source. The Company made a contract with Arun Contractors for electrical and fabrication work. On **10-8-2010** BX Ltd received bill for **Rs. 60,000** from Arun contractors towards electrical and fabrication work. ***Record the above transaction in Tally.***

REFERENCE BOOKS

1. B.B. Dam, H.C. Gautam, Theory and Practice of Financial Accounting, Ashok Publication.
2. Sanjay Saxena, P. Chopra, Computer application in Management, Vikas Publishing House Pvt. Ltd., New Delhi.
3. Marshall Romeny & Steinbart, Accounting Information System, Pearson Education, New Delhi.
4. K.K. Nadhani, Implementing Tally ERP 9, BPB Publications, New Delhi.

TCA-RE-5016: Project Work/Dissertation

- The students will be allowed to work on any project based on the concepts studied in core/elective or skill based elective courses.
- The group size should be of maximum three (03) students.
- Each group will be assigned a teacher as a supervisor who will handle both their theory as well lab classes.
- A maximum of Four (04) projects would be assigned to one teacher.
- Theory classes will cover project management techniques.

TCA-SE-6014: Programming in Python

02 Lectures, 04 Practical, Credits 4 (2+2)
Theory: 20 Lectures Practical: 20 Lectures

UNIT 1: Planning the Computer Program

(2 Lectures)

Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation

UNIT 2: Techniques of Problem Solving

(2 Lectures)

Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming

UNIT 3: Overview of Programming

(4 Lectures)

Structure of a Python Program, Elements of Python

UNIT 4: Introduction to Python

(4 Lectures)

Python Interpreter, Using Python as calculator, Python shell, Indentation, Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator).

UNIT 5: Creating Python Programs

(4 Lectures)

Input and Output Statements, Control statements (Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass.), Defining Functions, Default arguments.

UNIT 6: Python File Operations

(4 Lectures)

Understanding read functions, read(), readline() and readlines(), Understanding write functions, write() and writelines(), Programming using file Operations, Reading config files in python, Writing log files in python.

Practical / Lab work to be performed

Section: A (Simple programs)

(N.B: Student has to perform any four of the following experiments)

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.

2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria :
 - Grade A: Percentage ≥ 80
 - Grade B: Percentage ≥ 70 and < 80
 - Grade C: Percentage ≥ 60 and < 70
 - Grade D: Percentage ≥ 40 and < 60
 - Grade E: Percentage < 40
3. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. Write a program to display the first n terms of Fibonacci series.
5. Write a program to find factorial of the given number.
6. Write a program to find sum of the following series for n terms:

$$1 - \frac{2}{2!} + \frac{3}{3!} - \dots - \frac{n}{n!}$$
7. Write a program to calculate the sum and product of two compatible matrices.

Section: B (Visual Python)

(N.B: Student has to perform **any four** of the following experiments)

All the programs should be written using user defined functions, wherever possible.

1. Write a menu-driven program to create mathematical 3D objects
 - (i) curv, (ii) sphere (iii) cone (iv) arrow (v) ring (vi) cylinder.
2. Write a program to read n integers and display them as a histogram.
3. Write a program to display sine, cosine, polynomial and exponential curves.
4. Write a program to plot a graph of people with pulse rate p vs. height h. The values of p and h are to be entered by the user.
5. Write a program to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula $m=60/(t+2)$, where t is the time in hours. Sketch a graph for t vs. m, where $t \geq 0$.
6. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as follows:

$$P(t) = (15000(1+t))/(15+ e)$$
 where the time t is measured in hours. WAP to determine the size of the population at given time t and plot a graph for P vs t for the specified time interval.
7. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion:
 - (i) velocity wrt time ($v=u+at$)
 - (ii) distance wrt time ($s=u*t+0.5*a*t*t$)
 - (iii) distance wrt velocity ($s=(v*v-u*u)/2*a$)
8. Write a program to show a ball bouncing between 2 walls. (Optional)

REFERENCE BOOKS

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. Python Tutorial/Documentation www.python.org 2015
3. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist : learning with Python , Freely available online.2012
4. <http://docs.python.org/3/tutorial/index.html>
5. <http://interactivepython.org/courselib/static/pythonds>
6. <http://www.ibiblio.org/g2swap/byteofpython/read/>

TCA-SE-5024: Cyber Laws

02 Lectures, 04 Practical, Credits 4 (2+2)
Theory: 20 Lectures Practical: 20 Lectures

UNIT 1: Cyber Laws (5 Lectures)

Meaning of Cyber world and cyber law, The internet and online resources, Security of information, Computer security and Security threats, The language of cyber space, Legal enactments of cyber laws.

UNIT 2: Cyber Crimes (5 Lectures)

Introduction , Classification , Offences under the Information Technology Act 2000 - Computer related crimes , Digital forgery , Cyber defamation , Cyber pornography , Cyber stalking or harassment , Hacking and Cracking , Tampering with computer source documents , Publishing of obscene information in electronic form , Breach of confidentiality and privacy, Online theft , Internet fraud , Spoofing , Sniffing, e-mail spamming and bombing , Financial crimes, Data alteration /Destruction , ATM fraud , Identity Theft , Malicious programs, Cyber terrorism.

UNIT 3: Information Technology Act–2000 and its various Terms and Provision (5 Lectures)

History, object, Essence, and specifics of the Act, Salient features, e – Governance, Digital Signature , Cryptography , Digital Signature Certificate, Legal recognition of Digital Signature , Legal recognition of Electronic documents, Offences and Contraventions, Penalties and Adjudications, Digital evidence and Cyber forensics, Legal software and Legal Process outsourcing (LPO).

UNIT 4: Regulation of Cyber Space (5 Lectures)

Freedom of Expression in cyber space, The cyber Regulation Appellate Tribunal, Need for regulations in cyber space, Scope of cyber Laws in e- Commerce, e – Taxation and online Contracts , Global Efforts on electronic Communication and Protection.

Prescribed Legislations

1. Information Technology Act ‘2000

REFERENCE BOOKS

1. *Cyber law and Crimes* - Barkha and U. Rama Mohan

2. *Cyber Laws* – Justice Yatindra Singh
3. *Cyber Law in India : Law on Internet* (Pioneer book Publication , Delhi) –Dr . Farooq Ahmed
4. *Internet Law* - Chris Reed
5. *Law relating to computers , Internet and e – commerce* (Universal Law Publication co. , Delhi) – Nandan Kamath
6. *Information Technology : Law and Practice* (Universal Publication Co. Delhi) – Vakul Sharma .
7. *Legal diamention of cyberspace* (Indian Law Institute Publication, Delhi) - S. K. Verma and Raman Mittal .
8. *Cyber Crime Law Enforcement , Security and Surveillance in the Information age (Rout Leadge)* , 2000 – Brian Loader and Douglas Thomas .

TCA-SE-6034: Management Information System

04 Lectures, Credits 4 (4)

Theory: 40 Lectures

UNIT 1: **(8 Lectures)**
Organization and Information Systems, Changing Environment and its impact on Business - The IT/IS and its influence. The Organization: Structure, Managers and activities - Data, information and its attributes - The level of people and their information needs - Types of Decisions and information - Information System, categorization of information on the basis of nature and characteristics.

UNIT 2: **(8 Lectures)**
Kinds of Information Systems : Transaction Processing System (TPS) - Office Automation System (OAS) - Management Information System (MIS) - Decision Support System (DSS) and Group Decision Support System (GDSS) - Expert System (ES) - Executive Support System (EIS or ESS).

UNIT 3: **(8 Lectures)**
Manufacturing and Service Systems: Information systems for Accounting, Finance, Production and Manufacturing, Marketing and HRM functions - IS in hospital, hotel, bank.

UNIT 4: **(8 Lectures)**
Enterprise System: Enterprise Resources Planning (ERP): Features, selection criteria, merits, issues and challenges in Implementation - Supply Chain Management (SCM): Features, Modules in SCM - Customer Relationship Management (CRM): Phases. Knowledge Management and e-governance

UNIT 5: **(8 Lectures)**
Nature of IT decision - Strategic decision - Configuration design and evaluation Information technology implementation plan, Ethical responsibilities of Business Professionals – Business, technology. Computer crime – Hacking, cyber theft, unauthorized use at work, Piracy – software and intellectual property, Privacy Issues and the Internet Privacy

REFERENCE BOOKS

1. Management Information Systems”, Kenneth J Laudon, Jane P. Laudon, Pearson/PHI, 10/e, 2007
2. Management Information Systems”, W. S. Jawadekar, Tata McGraw Hill Edition, 3/e, 2004
3. MIS by Ralph Stair

TCA-RE-6016: Programming in Java

04 Lectures, 04 Practical, Credits 6 (4+2)
Theory: 60 Lectures Practical: 60 Lectures

- UNIT 1: Introduction to Java** **(1 Lectures)**
Features of Java, JDK Environment
- UNIT 2: Object Oriented Programming Concept** **(10 Lectures)**
Overview of Programming, Paradigm, Classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA
- UNIT 3: Java Programming Fundamental** **(10 Lectures)**
Structure of java program, Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch), Looping (for, while), Type Casting. (10L)
- UNIT 4: Classes and Objects** **(10 Lectures)**
Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes
- UNIT 5: Arrays and Strings** **(6 Lectures)**
Arrays, creating an array, Types of Arrays, String class Methods, String Buffer methods.
- UNIT 6: Abstract Class, Interface and Packages** **(8 Lectures)**
Modifiers and Access Control, Abstract classes and methods, Interfaces, Packages Concept, Creating user defined packages
- UNIT 7: Exception Handling** **(4 Lectures)**
Exception types, Using try catch and multiple catch, Nested try, throw and finally, Creating User defined Exceptions.
- UNIT 8: File Handling** **(5 Lectures)**
Byte Stream, Character Stream, File IO Basics, File Operations, Creating file, Reading file, Writing File
- UNIT 9: Applet Programming** **(6 Lectures)**
Introduction, Types Applet, Applet Life cycle, Creating Applet, Applet tag

Practical / Lab work to be performed

1. WAP to find the largest of n natural numbers.
2. WAP to find whether a given number is prime or not.
3. Write a menu driven program for following:
 - a. Display a Fibonacci series
 - b. Compute Factorial of a number
 - c. WAP to check whether a given number is odd or even.
 - d. WAP to check whether a given string is palindrome or not.
4. WAP to print the sum and product of digits of an Integer and reverse the Integer.
5. Write a program to create an array of 10 integers. Accept values from the user in that array. Input another number from the user and find out how many numbers are equal to the number passed, how many are greater and how many are less than the number passed.
6. Write a program that will prompt the user for a list of 5 prices. Compute the average of the prices and find out all the prices that are higher than the calculated average.
7. Write a program in java to input N numbers in an array and print out the Armstrong numbers from the set.
8. Write java program for the following matrix operations:
 - a. Addition of two matrices
 - b. Summation of two matrices
 - c. Transpose of a matrix
 - d. Input the elements of matrices from user.
9. Write a java program that computes the area of a circle, rectangle and a Cylinder using function overloading.
10. Write a Java for the implementation of Multiple inheritance using interfaces to calculate the area of a rectangle and triangle.
11. Write a java program to create a frame window in an Applet. Display your name, address and qualification in the frame window.
12. Write a java program to draw a line between two coordinates in a window.
13. Write a java program to display the following graphics in an applet window.
 - a. Rectangles
 - b. Circles
 - c. Ellipses
 - d. Arcs
 - e. Polygons
14. Write a program that reads two integer numbers for the variables a and b. If any other character except number (0-9) is entered then the error is caught by NumberFormatException object. After that ex.getMessage() prints the information about the error occurring causes.
15. Write a program for the following string operations:

- a. Compare two strings
 - b. Concatenate two strings
 - c. Compute length of a string
16. Create a class called Fraction that can be used to represent the ratio of two integers. Include appropriate constructors and methods. If the denominator becomes zero, throw and handle an exception.

REFERENCE BOOKS

1. Ivan Bayross, Web Enabled Commercial Application Development Using Html, Dhtml, javascript, Perl Cgi , BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication, 3rd Edition., 2009
3. Herbert Schildt, Java 7, The Complete Reference, 8th Edition, 2009.
4. E Balagurusamy, Programming with JAVA, TMH, 2007

TCA-RE-6026: Computer Networks

04 Lectures, 04 Practical, Credits 6 (4+2)
Theory: 60 Lectures Practical: 60 Lectures

UNIT 1: Basic concepts (16 Lectures)

Components of data communication, standards and organizations, Network Classification, Network Topologies ; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite.

UNIT 2: Physical Layer (6 Lectures)

Cabling, Network Interface Card, Transmission Media Devices- Repeater, Hub, Bridge, Switch, Router, Gateway.

UNIT 3: Data Link Layer (8 Lectures)

Framing techniques; Error Control; Flow Control Protocols; Shared media protocols - CSMA/CD and CSMA/CA.

UNIT 4: Network Layer (8 Lectures)

Virtual Circuits and Datagram approach, IP addressing methods – Subnetting; Routing Algorithms (adaptive and non-adaptive)

UNIT 5: Transport Layer (6 Lectures)

Transport services, Transport Layer protocol of TCP and UDP

UNIT 6: Application Layer (10 Lectures)

Application layer protocols and services – Domain name system, HTTP, WWW, telnet, FTP, SMTP

UNIT 7: Network Security (6 Lectures)

Common Terms, Firewalls, Virtual Private Networks

Practical / Lab work to be performed

Implement the concepts of Computer Networks such as:

1. Simulate Checksum Algorithm.
2. Simulate CRC Algorithm
3. Simulate Stop & Wait Protocol.
4. Simulate Go-Back-N Protocol.
5. Simulate Selective Repeat Protocol.

REFERENCE BOOKS

1. B.A. Forouzan: Data Communication and Networking, 4th Edition, Tata McGraw Hill, 2007
2. D.E. Comer, Internetworking with TCP/IP, Vol. I, Prentice Hall of India, 1998
3. W. Stalling, Data & Computer Communication, 8th edition, Prentice Hall of India, 2006.
4. D. Bertsekas, R. Gallager, Data Networks, 2nd edition, Prentice Hall of India, 1992.

TCA-RE-6036: Software Engineering

04 Lectures, 04 Practical, Credits 6 (4+2)
Theory: 60 Lectures Practical: 60 Lectures

- UNIT 1: Introduction** **(10 Lectures)**
The Evolving Role of Software, Software Characteristics, Software v/s Programs, Emergence of Software Engineering, Notable Changes in Software Development Practices, Software Development Life Cycle Models (SDLC): *Build and Fix, V-Model, Waterfall models, Prototyping Model, Incremental Model, Evolutionary model, Spiral Model*
- UNIT 2: Requirement Analysis** **(4 Lectures)**
Software Requirement Analysis and Gathering, Different ways of Requirement Gathering Process, Requirement Analysis and Modeling Techniques, Need for SRS, Components of SRS, Characteristics of good and bad SRS
- UNIT 3: Software Project Management** **(14 Lectures)**
Goal of Software Project management, Organization of SPMP (Software Project Management Plan) document, Estimation in Project Planning Process, Lines of Code (LOC), Function Point (FP) metric, Project Estimation Techniques: (*Empirical Estimation, Heuristics Estimation*), Expert Judgment, Delphi Cost Estimation, COCOMO models, Project Scheduling, Work breakdown structure, Activity Network Representation, Critical Path Method, Staffing level estimation, Norden's work, Putnam's work
- UNIT 4: Risk Management** **(4 Lectures)**
Software Risks, Risk Identification, Types of Risks, Risk Assessment, Risk Refinement, Risk Mitigation, Monitoring and Management Plan (RMMM) Plan
- UNIT 5: Quality Management** **(8 Lectures)**
Quality Concepts, Evolution of Quality Systems, Software Quality Assurance (QA), Total Quality Management (TQM), ISO 9000, How to get ISO 9000 Certification, Shortcomings of ISO 9000, SEI-Capability Maturity Model (CMM) and Integration
- UNIT 6: Design Engineering** **(10 Lectures)**
Design Concepts, Cohesion and Coupling, Classification of Cohesion and Coupling, Function Oriented design vs Structured Design, Elements of a Data Flow Diagram (DFDs), properties of a DFD, Balancing DFD, Synchronous and Asynchronous DFD, Structured design (SD) concepts, Basic elements used to design a SD, Design Review

UNIT 7: Testing Strategies & Tactics

(10 Lectures)

Software Testing Fundamentals, Strategic Approach to Software Testing, Verification and validation process, Unit Testing, Integration Testing :*Top Down approach* and *Bottom up approach*, System testing- Black-Box Testing: *Equivalent partitioning* and *boundary value analysis*, White-Box Testing and their type: *Statement Coverage*, *Branch Coverage*, *Multiple Condition Coverage* and Basis Path Testing (*Path Coverage*), Control Flow Graph (CFG), McCabe's Cyclomatic Complexity metric,

Practical / Lab work to be performed

(N.B: Student has to perform **any eight** of the following experiments)

Expertiment-1: Consider a Software project to do the followings: *Define problem Statement*, *Needs of the project*, *Identify the suitable life cycle model to use*, *possible software crisis*, *Strategies and techniques used for Requirement analysis and Gathering*.

Expertiment-2: Consider a project and design the suitable SRS document for the same.

Expertiment-3: Execute the LOC size estimation metric for a given problem.

Expertiment-4: Apply the Function Point (FP) size estimation metric for a given problem with suitable technical constrains.

Expertiment-5: Consider a project to implement COCOMO model to estimate effort of the project

Expertiment-6: Apply the Norden's model of staffing level estimation for a given problem definition.

Expertiment-7: Consider a project to implement Putnam's model of staffing level estimation.

Expertiment-8: Consider a problem definition to apply equivalent class partition technique to develop test cases.

Expertiment-9: Apply Boundary value analysis method to develop test cases for a project.

Expertiment-10: Design test suits for a given code segment applying statement Coverage testing technique.

Expertiment-11: Design test suits for a given code segment applying Branch Coverage testing technique.

Expertiment-12: Apply the Basis path testing for a given code segment of a project.

Expertiment-13: Design the DFD for a given project. (N.B: *using Software tools*)

Expertiment-14: Design the Structure Chart for a given project. (N.B: *using Software tools*)

Sample List of Projects: (N.B: one or more projects from the given list can be considered as a basis for the laboratory work)

1. **Criminal Record Management:** Criminal record management system for jailers, police officers and CBI officers
2. **DTC Route Information:** Online information about the bus routes and their frequency and fares
3. **Car Pooling:** Maintain information about the corporate employees within an organization to avail the facility of carpooling effectively.
4. Patient Appointment and Prescription Management System
5. Organized Retail Shopping Management Software
6. Online Hotel Reservation Service System
7. Examination and Result computation system
8. Automatic Internal Assessment System
9. Parking Allocation System
10. Wholesale Management System
11. Library Management System
12. Attendance Management System

REFERENCE BOOKS

1. R.S. Pressman, Software Engineering: A Practitioner's Approach (7th Edition), McGraw-Hill, 2009.
2. P. Jalote, An Integrated Approach to Software Engineering (2nd Edition), Naros Publishing House, 2003
1. K.K. Aggarwal and Y. Singh, Software Engineering (2nd Edition), New Age International Publishers, 2008.
4. I. Sommerville, Software Engineering (8th edition), Addison Wesley, 2006.
5. D. Bell, Software Engineering for Students (4th Edition), Addison-Wesley, 2005.
6. R. Mall, Fundamentals of Software Engineering (2nd Edition), Prentice-Hall of India, 2004.

TCA-RE-6046: E-Commerce Technologies

04 Lectures, 04 Practical, Credits 6 (4+2)
Theory: 60 Lectures Practical: 60 Lectures

UNIT 1: An introduction to Electronic commerce (10 Lectures)

What is E-Commerce (Introduction And Definition), Main activities E-Commerce, Goals of E-Commerce, Technical Components of E-Commerce, Functions of E-Commerce, Advantages and disadvantages of E-Commerce, Scope of E-Commerce, Electronic Commerce Applications, Electronic Commerce and Electronic, Business models (C2B,C2C, B2B, B2C,B2G,G2B,G2C)

UNIT 2: The Internet and WWW (10 Lectures)

Evolution of Internet, Domain Names and Internet Organization (.edu, .com, .mil, .gov, .net etc.) , Types of Network, Internet Service Provider, World Wide Web, Internet & Extranet, Role of Internet in B2B Application, building own website, Cost, Time, Reach, Registering a Domain Name, Web promotion, Target email, Banner, Exchange, Shopping Bots

UNIT 3: Internet Security (10 Lectures)

Secure Transaction, Computer Monitoring, Privacy on Internet, Corporate Email privacy, Computer Crime(Laws, Types of Crimes), Threats, Attack on Computer System, Software Packages for privacy, Hacking, Computer Virus(How it spreads, Virus problem, virus protection, Encryption and Decryption, Secret key Cryptography, DES, Public Key Encryption, RSA, Authorization and Authentication, Firewall, Digital Signature(How it Works)

UNIT 4: Electronic Data Exchange (10 Lectures)

Introduction, Concepts of EDI and Limitation, Applications of EDI, Disadvantages of EDI, EDI model, Electronic Payment System: Introduction, Types of Electronic Payment System, Payment Types, Value Exchange System, Credit Card System, Electronic Fund Transfer, Paperless bill, Modern Payment Cash, Electronic Cash

UNIT 5: Planning for Electronic Commerce (10 Lectures)

Planning Electronic Commerce initiates, Linking objectives to business strategies, Measuring cost objectives, Comparing benefits to Costs, Strategies for developing electronic commerce web sites

UNIT 6: Internet Marketing (10 Lectures)

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, Personalization e-commerce.

Practical / Lab work to be performed

(N.B: Student has to perform **any four** of the following experiments)

E- Commerce Technologies LAB (based on the following topics):

1. HyperText Markup Language (HTML): structural setup; page layout; text manipulation; special characters; images; links. Intermediate: image maps; tables; frames, forms; meta tags; web forms.
2. Cascading Style Sheets (CSS): embedding/linking; HTML element selectors; classes; ID selectors, text manipulation; background; borders and spacing; layout; context selectors and grouping, pseudo-classes; pseudo-elements.
3. JavaScript : writing your first script; creating HTML tags; user input and output; loops and tables; payroll calculator, forms and text fields; validating an email address; radio buttons; check boxes; self-grading tests, image rollovers; slide shows; real-time clock; controllable clock; working with cookies.
4. Perl/CGI 10: sample Perl operations; random numbers; lists; dealing four poker hands; time manipulation; subroutines, hash tables; files; string matching, CGI; registration lists; surveys.
5. SQL and regular expressions: Regular expressions: select; where; order by; insert; update; delete, like; aggregate functions; create table; alter table; drop deterministic functions; non-deterministic functions, basics; repeating; positioning.
6. Beginner: between; in; distinct; group by; aliases; table., nested selects; Sound Ex; join;
7. ASP structural setup: response write; retrieving from forms; retrieving from query string; variables; control constructs; subroutines and functions; session state; application variables; server variables; debugging, reading and writing cookies; server-side includes; response object methods; VBScript functions; error handling; debugging, browser details; CDONTS; files; output from a recordset; global.asa; setup instructions for using IIS and ASP. Flash 3 Create Flash movies of moving and interactive objects.

REFERENCE BOOKS

1. G.S.V.Murthy, E-Commerce Concepts, Models, Strategies- :- Himalaya Publishing House, 2011.
2. Kamlesh K Bajaj and Debjani Nag , E- Commerce , 2005.
3. Gray P. Schneider , Electronic commerce, International Student Edition, 2011,
4. Henry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, E Commerce, Fundamentals and Applications, Wiely Student Edition, 2011