Syllabus For B.Voc in Information Technology (IT)

Programme Template: B.Voc Course (CBCS) in IT

Gauhati University

Semester	CORE COURSE (12 papers, 72 credits)	Ability Enhancement Compulsory Course(AECC) (2 papers, 8 credits)	Skill Enhancement Course (SEC) (4 papers,16 credits)	Discipline Specific Elective(DSE) (6 papers,36 credits)
I	ITX-VC-1016 ITX-VC-1026 ITX-VC-1036	ENG-AE-1014		
II	ITX-VC-2016 ITX-VC-2026 ITX-VC-2036	ENV-AE-2014		
III	ITX-VC-3016 ITX-VC-3026 ITX-VC-3036		XXX-SE-3XX4	
IV	ITX-VC-4016 ITX-VC-4026 ITX-VC-4036		XXX-SE-4XX4	
V			XXX-SE-5XX4	ITX-VE-5016 ITX-VE-5026 ITX-VE-5036
VI			XXX-SE-6XX4	ITX-VE-6016 ITX-VE-6026 ITX-VE-6036

QP Aligned Syllabus for B.Voc (IT) :

Level	QP	SEM	Sub-Code	Subject
4	Domestic Data Entry Operator SSC/Q2212	I	S-1.1	Fundamentals of Computer
			S1.2	Office Automation & Desktop Publishing
			S1.3	Introduction to Computer Programming
5	Test Engineer SSC/Q1301 Or Web Developer SSC/Q0503	II	S2.1	Internet & Web Technology
			S2.2	Computer Application in Printing & Graphics
			S2.3	Introduction to Database Management System
6	Master Trainer to Junior Software Developer SSC/Q0509	III	S3.1	Data Structure and Algorithm
			S3.2	Object Oriented Programming
			S3.3	Software Engineering
		IV	S4.1	Operating System
			S4.2	Programming in JAVA
			S4.3	Mathematics
7	Software Developer SSC/Q0501	V	S5.1	Computer Network
			S5.2	System Administration Using Linux
			S5.3	Mini Project
		VI	S6.1	Android Application Development
			S6.2	Database Design & Programming

		S6.3	Major Project

Detailed Syllabus

SEMESTER-I

Paper S1.1: Fundamentals of Computer

Total Credit: 6
Total Marks: 100

Unit 1: Computer Architecture and Peripherals (Marks :15)

History and Generations of Computer, Classification and Components of Computer & its Interconnections, Computer Memory (Primary and Secondary Memory), Different Storage Units of Computer System. Computer Hardware & Software and its types.

Unit 2: Operating System (Marks: 15)

Operating System Definition, Different types of Operating System, Different Parts and Processes of Operating System, System Tools.

Unit 3: Network Fundamentals (Marks: 10)

Computer Network Definition, Architecture and Requirement of Network, Types & Functions of Network and its Applications, Network Devices, Network Media and Internet Basics.

Unit 4: Computer Security (Marks: 10)

Computer Security Definition, Types of Security Threats, Different Threats Prevention Techniques. Computer Firewall, System Backup and Restore.

Unit 5: Introduction to ICT Hardware (Marks :10)

Number System- Binary, Octal, Hexadecimal, ASCII, EBDIC, Gray Codes, Hard Disk Drive: Logical Structure And file system, FAT, NTFS, Hard Disk Tools: Disk Clean Up, Error Checking, De-Fragmentation, Scanning for Virus, Formatting, Formatting, Installing Additional HDD. Cache and Virtual Memory Concept, IP Address.
Suggested Books-

1. Computer fundaments, Sinha and Sinha- BPB Publication
2. Glister, R: PC Hardware A Beginners, Tata McGraw Hills
3. Sudhaka, V, Varanasi &Mrunalini: Computer Education, Neelkamal Publication, Hyderabad.

Paper S1.2: Office Automation & Desktop Publishing

Total Credit: 6
Total Marks: 100

Unit 1:   **(Marks-15)**

Documentation Using Word - Introduction to word processing interface, Toolbars, Menus, Creating & Editing Document, Formatting Document, Finding and replacing text, Format painter, Header and footer, Drop cap, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Previewing and printing document, Advance Features of Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

Unit 2:   **(Marks-15)**

Electronic Spread Sheet using Excel - Introduction to Excel, Cell, cell address, Creating & Editing Worksheet, Formatting and Essential Operations, Moving and copying data in excel, Header and footer, Formulas and Functions, Charts, Cell referencing, Page setup, Macros, Advance features of Excel-Pivot table & Pivot Chart, Linking and Consolidation, Database Management using Excel-Sorting, Filtering, Validation, What if analysis with Goal Seek, Conditional formatting.

Unit 3:   **(Marks-8)**

Presentation using PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.,

Unit 4:   **(Marks-7)**

Introduction to MS Access: creating database creating and manipulating tables, forms, queries, reports, modules, importing and exporting of data.

Unit 5:   **(Marks-7)**

Adobe Page Maker Basic concept: Creating and opening publication, using the tool box, working with palettes, text and graphics, starting a publication from the template, saving and closing a publication.

Unit 6:   **(Marks-8)**

Introduction to Internet: Internet, Growth of internet, Anatomy of internet , History of WWW and basic internet terminologies, Browsers , Electronic mail. Internet Applications : Commerce on the internet , Governance on the internet , Impact of internet on society

Suggested Readings

1. Microsoft Office – Complete Reference – BPB Publication
2. Learn Microsoft Office – Russell A. Stultz – BPB Publication
3. Courter, G Marquis (1999). Microsoft Office 2000: Professional Edition. BPB.

4. Koers, D (2001). Microsoft Office XP Fast and Easy. PHI.

Paper S1.3: Introduction to Computer programming

Total Credit: 6
Total Marks: 100

Unit 1: (Marks:10)

Concept of Computing: Algorithm, Flowchart Programming Languages : Machine language, Assembly language, High Level Language Translators : Assembler, Compiler, Interpreter. Algorithm for problem solving.

Unit 2: (Marks:15)

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.

Unit 3: (Marks:15)

Conditional statements: if, if-else, switch Iterative Statement-white, 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.

Unit 4: (Marks:10)

Arrays and pointers
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 5: (Marks:10)

Structures and Files
Structure – declaration and use. Structure member resolution and structure pointer member resolution operators.
Standard C library.Files in C—opening, closing, reading and writing of files.Seeking forward and backward.

Suggested Books-
1. R.G.Dromey; How to solve it by Computer; Prentice Hall of India, 1992; (First Edition).

2. Cooper, Mullish; The Spirit of C, Jaico Publishing House; New Delhi, 1987. (Fourth Edition).
3. B. Gottfried; Programming in C; Tata McGraw Hill, New Delhi; (Second Edition).

Lab: (Covering Paper S 1.3)

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.
    a) A company insures its drivers if either of the following conditions are satisfied
    b) Driver is married.
    c) Driver is an unmarried, Male and above 30 years of age.
    d) Driver is unmarried, female and above 25 years of age.
5. 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 <= 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. Program to find mean and standard deviation (SD) for a set of n numbers without using array.
11. Write a program to find out the roots of a quadratic equation. Use proper testing to find checks for real and complex roots.
12. 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‖.)
13. Write a program to print the PASCAL Triangle up to the n-th row where n is an input to the program.
14. 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.
15. Write a program to convert a decimal number into binary number using function.
16. Write a program to display the result of sine series using function.
17. Write a program to find the sum of the following series
    $1+x-x^3/3!+x^5/5!-x^7/7!+$ . . . . . corrected up to the 3 decimal place.
18. Write a program to read n numbers in a sorted array and insert a given element in a particular position
19. Write functions to compute the factorial of a number using both recursive and non-recursive procedure.
20. Write a program to print the values of ncr and npr for given positive integers nr > 0. Use a function fact(n) to return the factorial of a non-negative integer n.
    ncr=n!/r!*(n-r)! npr=n!/(n-r)!
21. Write a program to display the first n Fibonacci numbers using function.
22. 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.
23. Write a program to Multiply two matrices using function

24. Write a program to display the upper Triangle and lower Triangle of a given square matrix using function.
25. Write a function to check if a given square matrix is symmetric or not. Write a main function to implement it.
26. Write a program to read a m X n matrix and calculate the Row sum and Column Sum of the matrix
27. 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.
28. Write a program to merge two sorted arrays.
29. Write a program to implement selection sort using function.
30. Write a program to count the number of vowels in a string.
31. Write a program to concatenate two strings using function (without using library function).
32. Write a program to convert a string from upper case to lower case and vice versa.
33. Write a program to swap two numbers using function (pass the pointers).
34. Write a program to sort n number of strings in ascending order using pointer.
35. Write a program using pointers to copy a string to another string variable (without using library function).

Internal Assessment includes

1. Seminar on how to Manage your work to meet requirements
2. Seminar on how to Maintain a healthy,safe and secure working environment
3. Mock interview
4. Report preparation

The interview board will consist of an external expert, the head of the concerned departments and the course coordinator of the course will constitute an expert panel. Students will have to appear before the panel for Mock interview.

SEMESTER II

Paper S-2.1: Internet and Web Technology

Total Credit: 6
Total Marks: 100

Unit 1:   **(Marks:20)**

Introduction to internet: Internet, Growth of internet, Anatomy of internet , History of WWW and basic internetterminologies, Browsers, Electronic mail. Internet Applications : Commerce on the internet, Governance on the internet, Impact of   internet on society.

Unit 2:   **(Marks:10)**

Internet technology and protocols: What is networks ? Need of computer networks. Characteristics of LAN, MAN, WAN.A brief idea of OSI reference model and TCP/IP .Difference between OSI and TCP/IP.Physical topologies (Bus , Ring , Tree , Star , Hybrid etc ..)Logical topologies (protocols) A brief description of Ethernet, FDDI , ATM , Token ring .

Unit 3:   **(Marks:10)**

File transfer protocol: Introduction to FTP & terminologies, FTP servers and authentication, GUI based FTPclients, Browser based FTP clients.

Unit 4:   **(Marks:10)**

Internet management security concepts: Overview of internet security, Firewalls. Internet security management concepts &information. Privacy & copyright issues.

Unit 5:   **(Marks:10)**

HTML: Introduction to HTML, basics & elements of HTML, attributes, headings, paragraphs,links, Images, Lists, Tables, Forms, Frames.
Client side scripting:Introduction to JavaScript & its basics, data types, variables operators, functions looping,objects, arrays, strings.
Server side scripting:Introduction to PHP, basic programming principles & database connectivity.

Suggested Reading :
1.   HTML & XML an Introduction. PHI .
2.   A. S. Godbole, A. Kahate; Web Technologies; Tata McGrew-hill;
3.   Andrew S. Tanenbaum; Computer Network; PHI; (Fourth Edition);

Lab (Covering Paper S 2.1)
Internet and Web Technology

Assignments
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 aparagraph)
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

XML
21. Construct an XML document that contain information about products of an organization.
22. Construct an XML document that contain information of 5 students (such as roll no., name , address, class).
23. Construct an XML document that contain details of 10 books.

JAVAScript
24. Write a program in javasrcript to accept a name from the user and display the same name in an alert box.
25. Write a program in javasrcript to display a message in a confirm box.
26. Write a program in javasrcript to display the message ‗time is running out' in the status bar.

27. Write a program in JavaScript to enter marks of a student and find his/her grade according to the following:
    if marks>=90 then grade A
    if marks>=80 then grade B
    if marks>=70 then grade C
    if marks>=60 then grade D
    else fail.
28. 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..
29. Write a program in JavaScript to accept 2 nos from the user and show the working of all arithmetic operators.
30. Write a program in JavaScript to accept 2 strings and concatenate them.
31. Write a program in JavaScript to display the current date and time.
32. Write a program in JavaScript to find the length of an array.
33. Write a program in JavaScript to check whether a string is palindrome or not.
34. Write a program in JavaScript that responds to a mouse click anywhere on the page(using mouse click).
35. Write a program in JavaScript to display the contents of a check box in a alert box.

36. Write a program to validate a form in the user id and password forms.
37. Write a program in JavaScript to crate a welcome cookie, Button animation, Image map with added JavaScript Simple timing, Timing event in an infinite loop

VBScript
38. Write a program in VBScript to create a variable.
39. Write a program in VBScript to uppercase to lowercase.
40. Write a program in VBScript to Create an array
41. Write a program in VBScript using conditional statements loop
42. Write a program in VBScript using loop.
43. Write a program in VBScript to display Date and Time
44. Write a program in VBScript to display the current month and day.

ASP
45. Write a program in ASP to interact with a user in a form that uses the "get" method.
46. Write a program in ASP to interact with a user in a form that uses the "post" method.
47. Write a program in ASP to interact with a user in a form with radio buttons.
48. Write a program in ASP to create a welcome cookie.

Paper - S:2.2: Computer Application in Printing and Graphics

Total Credit: 6
Total Marks: 100

Unit I: Introduction to DTP, trends in printing technology, usage of computers in printing. DTP printing technology. Introduction to DTP software's, Use of Text tool Adobe, Photoshop Corel Draw.

Story editing, formatting**.**   **(Marks:10)**

Unit II: Working with graphics: using different graphic tools importing graphics working with colour, table editing. Desk Top Publishing Hardware, Macintosh, Cost estimation of DTP.   **(Marks:10)**

Unit III: Graphics

Definitions – Print Design Vs Digital Design – Elements of Graphic Design –

Tools of Organization – Architecture of Type/Font – Building Blocks of Graphic

Design: Whitespace, Rules, Borders, Boxes, Shadows, Bleeds – Illustrations –

Working with Photographs – Working with Color

Designing for Print: Newsletters – Newspapers – Magazines – Brochures –

Pamphlets – Posters   **(Marks:10)**

Unit IV: Animation

Definition – Types of Animation: Cel Animation, Stop Motion Animation,

Computer Animation, Frame by Frame, Keyframe Animation – Applications –

Hardware – Software – Considerations for selecting tool

Animation Techniques: Transformation – Compositing – Color Correction –

Modeling – Lighting – Masking – Layering – Shading – Particles   **(Marks:10)**

Unit V: Rendering and Career Prospects

Rendering: Types – Features – Techniques – Real-Time Rendering – Software

Creators: Visual Development artist, Layout artist, Character animator, Cleanup

artist, Color stylist, Graphic Designer, Animator, Effects animator,

Compositor   **(Marks:10)**

Unit VI: Image Processing

Raster Graphics – Vector Graphics – Image File Formats: Windows Formats,

Macintosh Formats, Cross Platform Formats – Audio & Video File formats –

Audio & Video Streaming Formats – Graphics and Animation for Web – Web File

Formats – CODEC: LossyVs Lossless, Compression Techniques   **(Marks:10)**

Laboratory (Covering S 2.2)

1. Introduction to Computer Terminologies.

2. Use of different Hardware devices.

3. Use ofWord-Processing Softwares.

4. DTP and its features.

5. Softwares used in Printing.

6. Page set-up with different sizes and margins.

7. Preparation of Text rich documents.

8. Different kinds of Scanners, their working and uses.

9. Image and Text merging.

10. Modifications and Editing of Illustrations and Text.

11. Using various tools of Printing Softwares.

12. . Introduction to photoshop-how you can differentiate it from illustrator, different types of the formats, their compatability to different software, introduction of tool box, uses of different filters, masking and working on images, creating a presentation using software.

13. Quark express :Pagemake up, formating and editing in the software.

14. Flash : Introduction of 2-D animations, study of tool box, menu bar, how you can use them in your industry, how you can create different effects like moving on selected path, masking of images, etc.

Paper - S: 2.3: Introduction to Database Management System

Total Credit: 6
Total Marks: 100

Unit 1:   (Marks:15)

File Structure: Record storage and primary file organization: memory hierarchies and storage devices, Storage of DataBases, Placing file records on disks: Records and its Types, Files, Fixed length records and variable length records, Record Blocking, allocating file blocks on disks, operation on files.
Issues in Physical Design : Concept of indexes

Unit 2:   (Marks:15)

Overview of Database Management System: Definition of DataBase, Traditional File Approach vs. DBMS approach, Characteristics of the Data Base Approach, DBMS user, Role of a DBA, Advantage of using DBMS, DBMS architecture, Data independence
ANSI/SPARC 3 level architecture.

Unit 3:   (Marks:15)

Relational Models: Fundamental integrity rules: entity integrity, referential integrity, Relational algebra(Select, Project, Cross ,Product , theta join, equi join, natural join, outer join),Set Operation ANSI SQL –92 Standard: DDL, DML, SQL constructs(Select .. From…Where… Group by ….. Having… Order by….), Insert, Delete, Update, View, Definition and use, nested quires, Constraints considers(NOT NULL , UNIQUE, Check Primary key. Foreign key)

Unit 4:   (Marks:15)

Database Design: Conceptual model, logical model, physical model.ER model as a tool for conceptual design-entities, attributes and relationships, weak and strong entities, conversion of ER model into relational schema. DFD.Normalization: informal design guidelines for relational schemas (overview level), functional dependencies, different types of keys. Normal forms (first, second, third, BCNF). Functional dependency diagram and design of relational database from it.

Suggested Reading:

1.   Introduction to database management system, C.J. Date
2.   Fundamentals of data base management system, Elmasri&Navathe
3.   An introduction to Database systems; Bipin C. Desai; Galgotia publications.
4.   Database Systems - Concept, Design and Applications; S.K.Singh; Pearson Education.

Laboratory (Covering Paper S:2.3)

1. Consider the following relational schema for Library Database.
   BOOK (Bookid ,Title , Publishername)
   BOOK_AUTHORS (Bookid , Authorname)
   PUBLISHER (Name , Address , Phone)
   BOOK_COPIES (Bookid, Branchid, No_of _copies)
   BOOK_LOANS (Bookid ,Branchid,CardNo,Dateout ,Duedate)
   LIBRARY_BRANCH (Branchid,Branchname,Address)
   BORROWER (CardNo,Name,Address,Phone)
   Write a program segment that retrieves the list of book that became overdue yesterday & prints thebook title and borrower's name for each. Use embedded SQL with JAVA or C as host language.

2. Write the appropriate SQL DDL statements for declaring the relational schemas for Library database.Specify appropriate keys & referential triggered action.

3. Specify the following views in SQL on the Company Database described below.
   EMPLOYEE (eno , fname,lname , initial , address ,sex , salary , supereno , Dno)
   DEPARTMENT (Dname ,Dnumber , Mgreno , mgrstartdate)
   DEPT_LOCATIONS (Dnumber , dlocation)
   PROJECT (Pnumber , pname , plocation , Dnum)
   WORKS_ON (eeno ,dependent_name,sex,Bdate,relationship)
   a) A view that has the department name, manager name, manager salary for everydepartment.
   b) A view that has the employee name, supervisor name & employee salary for eachemployee who works in _Research department _.

4. Consider the relational schema. Suppose all the relations were created by user X, whowants to grant the following privileges to account A & B.
   a) Account A can retrieve or modify any relation except dependent can grant any of these privileges to other users.
   b) Account B can retrieve all the attributes of employee & department except for salary, mgreno and mgrstartdate.
   c) Write SQL statements to grant these privileges. Use views if required.

5. Create the Company data base using appropriate SQL DDL statements & insert data to the tables. Consider all the referential integrity constraints .Verify your database with the help of somequeries.

6. Create a table *Employee* with the following columns:
   Emp_no (numeric) primary key
   Emp_name (string)
   Join_date (Date)
   Basic_pay_fixed_at (numeric)
   Date_of_birth (Date)
   Insert the following data into the table.

Emp_no.	Emp_name	Join_date	Basic_pay_fixed_at	Date_of_birth
1001	Charles Babbage	01-Jun-2000	8000.00	03-10-1973
1002	George Boole	01-Jul-2001	5000.00	04-12-1972
1003	E.F. Codd	01-Jun-2001	8000.00	06-03-1969
1004	Bill Gates	01-Jul-2003	5000.00	09-10-1995
1005	Tony Greig	01-Aug-2004	8000.00	04-05-1985

7. Create the following two tables and insert data into the tables.
   Player (Roll no.→Primary Key)

```
Roll no.        Name
10               Vijay Amrithraj
20              Leander Paes
30              Mahesh Bhupathi
40              SaniaMirza
```
Match (Match_no→Primary key, Roll no→Foreign key)

```
Match_no            Roll_no.        Match_Date    Opponent
1                   20              10-Jul-2008   Washington
2                       30              12-Jan-2008   Sampras
3                       20              12-Aug-2008   Borg
4                       30              20-Mar-2008   Vijay
```

   a) Perform EQUIJOIN operation to retrieve data from both the files.
   b) Perform OUTERJOIN operation to retrieve the unmatched records.

8.   Design an ER diagram for a **BANK** database schema. To consider that each Bank can have multiple branches, and each branch can have multiple Accounts and Loans for customer. Also to specify the non weak& weak entity types, key attributes & key types, relationship types, instances, constraints and participations.

9. Create a table **Student** taking the attributes given bellow
   Roll_no, Student_name, Address, Date_of_addmission, Class Section and Contact_no.
   Write appropriate queries to perform the following operations:
   a) To insert values in the Student table.
   b) To delete values from Student table
   c) To list the names of all students which roll_no> 20.
   d) To search for students who got admitted before 01-01-2006.
   e) To change the name of the student whose roll number is 10 to Amar.

10.   Create tables **Department** and **Employee** with the attributes given bellow.
       Employee (EmpNo ,Empname, Address, Dno)
       Department (Dno, Dname, Location)
       Dno in Employee is a foreign key.
   Write appropriate queries to perform the following operations:
   a) To insert values in the tables.
   b) To retrieve the names and addresses of all Employees working in the Finance department.
   c) To print the location where Administration department is located.
   d) To delete all information regarding a particular employee.

11. Create table **Student** and **Course** taking the attributes given bellow.
   Student (Roll_no, Name, Semester, Course_no(Foreign key))
   Course (Course_no, Course_name)
   Write appropriate queries for the following operations:
   a) To retrieve names of all students who are admitted to the course _BCA'.
   b) To retrieve the names of all students whose course name is _BCA' and who are in the 3rdsemester.
   c) To display details of all courses in which more than 100 students got admitted.
   d) For course being offered, display the course name and number of students admitted to the course.

12.   Create tables **Employee**, **Department**, **Location**, **Works_on**, and **Project** taking the attributes given bellow.
       Employee (Fname, Lname, Empno, Bdate, Address, Salary, Dnumber)
       Department (Dname,Dnumber,Mgrno)
       Locations(Dnumber, DLocation)
       Works_on(Empno, Pnumber, Hours_per_day)
       Project(Pname, Pnumber, Location,Dnumber (Foreign))

Dependent(Empno, Dependent_name, Sex, DOB, Relationship)
Write appropriate queries for the following operations:
a) Retrieve the names and addresses of all employees who work in the Finance department.
b) To retrieve the names of all employees who works on all the projects controlled by department number 6
c) For each department, print the name of the department and the name of the manager of the department.
d) Retrieve the location where the Administration department is located.
e) For every project located in Mumbai list the project number, the controlling department and department manger's name and address.
f) Find out how many employees are there in each department.
g) Find the total salary of all employees of the ―Research‖ department, as well as the maximum, minimum and average salary in this department
h) Retrieve the name of all employees who have no dependent.
i) Alter the ―Employee‖ table by deleting the coloumnBdate.
j) Retrieve the Fname, Lname of all employees whose salary is higher than average salary.
k) For each department retrieve the department number, the number of employee in the department and their average salary.
l)Retrieve the name of all employees who have two or more dependent
m) Retrieve the details of all employees who works on project number 1,2,3

13. Create Table
    Client_master(Client_no, name, address, Bdue)
    Product_master(P_number,Description,saleprice,costprice)
    Sales_master(Salesmno,Sname,Addres,Salamnt,Remarks)
    Sales_order(O_no,Client_no,Odate,Delyaddr,Salesmno)
    Sales_order_detail(Order_no,Product_no, Qtyorder, product_rate,Qty_dispatched)
Write appropriate queries to perform the following operations:
a) List name of all clients having _a' as the second letter in their names.
b) Retrieve the description and total Qty sold for each product.
c) Find product no. and description of non moving products (i.e product not being sold).
d) For each product being sold, list the product number and the total amount (in Rs.) sold.
e) List all client who stay in _Bangalore' or _Mumbai'
f) List the clients who stay in a city whose First letter is _M'
g) Find the names of clients who had purchased the item _Trouser'.
h) Find out if T-Shirt' has been ordered by any client and if so print the details of the client.
i) List details of all products whose unit price is more than Rs. 5000.00.
j) Calculate the total amount (in Rs.) purchased by each client that has purchased items amounting more than Rs. 20000.

14. Create table
    Author(Author_id, Name, City, Country)
    Catalog (Book_id, Title, Author1_id, Author2_id, Publisher_id, Category_id, Year, Price)
    Publisher(Publisher_id, Name, City, Country)
    Order_details(Order_no, Book_id, Quantity)
    Category(Category_id, Description)
    Order_summary(Order_no,Member_id,Odate,Amount,Ostatus)
    Member(Member_id, Name, Address, Contact)
Assume that all books have at most two authors.
Write appropriate queries to perform the following operations:
a) Retrieve the title, author, and publisher names of all books published in 1999 and 2006.

b) Retrieve the title of all books whose one author is ⌐A Tanenbum'.
c) Get the details of all books whose price is greater than the average price of the books.
d) Get the names of all the books for which an order has been placed.
e) Get the names of all authors who have more than ten books in the catalog.
f) Get the details of the authors whose books are being sold from the book club.
g) Get the title and price of all books whose price is greater than the maximum of the category average.

Internal Assessment includes

1. Seminar on Writing presentation skill
2. Group discussion
3. Mock interview
4. Report preparation

The interview board will consist of an external expert, the head of the concerned departments and the course coordinator of the course will constitute an expert panel. Students will have to appear before the panel for Mock interview.

SEMESTER III

Paper S-3.1: Data Structure and Algorithm

Total Credit: 6
Total Marks: 100

UNIT I: **Introduction to data structure**   **(Marks:10)**

Basic concept, Abstract data types, Fundamental and derived data types. Representation, primitive data structures.

UNIT II: **Arrays**   **(Marks:10)**

Single and multidimensional arrays. Address calculation using column and row major ordering. Various operations on Arrays. Matrix multiplication.

UNIT III: **Stack and queues**   **(Marks:10)**

Representation of stacks and queue using arrays and linked-list. Circular queues.

Applications of stacks

Conversion from infix to postfix and prefix expressions, postfix evaluation algorithm

UNIT IV: **Linked lists**   **(Marks:10)**

Singly linked list; operations on Linked-list . Circluar linked lists, Doubly linked lists.

UNIT V: **Trees**   **(Marks:7)**

Basic terminology, Binary tree traversal methods - Preorder, Inorder and Postorder . Application of binary tree, Binary search tree, insertion and search operations on binary search tree.

UNIT VI: **Searching and sorting**   **(Marks:7)**

 Searching: Sequential and binary searches.

Sorting - Insertion, selection, bubble, quick, merge, radix.

UNIT VII: **Graphs**   **(Marks:6)**

Definition of Graph, Graph terminology, Directed, Undirected & Weighted graphs. Graph representation: Adjacency matrix, Adjacency lists.

BOOKS RECOMMENDED :

1. Robert L. Kruse; Data Structures and Program Design; Prentice Hall, 1987. (Second Edition).

2. A. S. Tanenbaum; Data Structure using C; PHI.

3. H. Sahani; Fundamentals of Data Structure in C; Orient Publications. (Second Edition).

Paper S3.2: Object Oriented Programming

Total Credit: 6
Total Marks: 100

UNIT I: **Principles of Object Oriented Programming**   **(Marks:10)**

1.1 Basic concept of OOP,

1.2 Procedural programming vs OOP

1.3 Advantages of OOP, OOP languages

1.4 Concept of Class, Objects, Concept of Inheritance and encapsulation,

1.5 Operator overloading, Dynamic Binding.

1.6 Overview of OPP using C++,

1.7 Basic program construction.

UNIT II: **Elements of C++ Language**   **(Marks:10)**

2.1   Keywords and Identifiers in C++

2.2   Variables and Constants,

2.3   Declaration and Initialization of Variables,

2.4   Concept of Dynamic Initialization of variables, Enumerated variables,

2.5   Basic Data Types,

2.6   Arrays and Strings, User Defined Data types,

2.7   Arithmetic, Relational, Logical Operators and Operator Precedence

2.8   Manipulators, Type Conversions and type cast operators

2.9   Console I/O: cin, cout functions.

2.10   Control Statements.-if; if-else; else….if; switch statements

2.11   Loops: for, while, do-while, Break, continue, go to

UNIT III: **Functions**   **(Marks:5)**

3.1   Syntax of a Function.

3.2   Function Prototype, Calling function, Function definition

3.3   Passing arguments and returning values.

3.4   Pass by value, pass by reference.

3.5   Passing and returning structure variables

3.6   Inline and overloaded function

3.7   Default arguments, returning by reference.

UNIT IV: **Classes and Object**   **(Marks:5)**

          4.1   Definition and Declaration of a Class

          1.2   Declaration of members.

          1.3   Declaration of objects

          4.4   Objects as function arguments.

          4.5   Array of objects.

          4.6   Returning objects from function.

          4.7   Structures and classes.

UNIT V: **Constructors and Destructors**   **(Marks:5)**

          5.1 Concept of constructors. Types of constructors. Parameterized constructor,

              Constructor with default arguments, Copy constructors

          5.2 Dynamic Initialization of Objects   .

          5.3 Concept of Destructors.

UNIT VI: Operator Overloading   **(Marks:5)**

           6.1Concept of Operator Overloading

          6.2 Unary and Binary Operators.

          6.3 Overloading of unary and binary operators.

UNIT VII: **Derived Classes and Inheritance**   **(Marks:5)**

          7.1   Concept of inheritance

          7.2   Derived and Base Class- Definition and Declaration.

          7.3   Types of Inheritance.

          7.4   Public, Private and Protected Access

          7.5   Constructors in Derives Classes

UNIT VIII: **Pointer**   **(Marks:10)**

          8.1.   Pointer Basics.

          8.2.   Address Operator and Pointer Variables.

          8.3.   Pointer Arithmetic.

          8.4.   New And Delete Operator

          8.5.   Null Pointer.

          8.6.   Reference and Constant pointer.

          8.7.   Array of Pointers.

          8.8.   Pointers to Object and Pointers to Pointer.

UNIT IX: **Virtual Function & Polymorphism**   **(Marks:5)**

      9.1   Pointers to Derived Objects and Virtual Functions.

      9.2   Early binding vs. Late binding.

      9.3   Abstract Classes and Pure Virtual Function.

Suggested Readings::

1. Robert Laffore; Object Oriented Programming in Turbo C++;
    Galgotia Publication,1996; (Fourth Edition).
2. E. Balaguruswamy; Object Oriented Programming with C++;Tata
    McGrahill, 1997; (Third Edition) ;
3. Yashavant Kanitkar; Visual C++ Programming; BPB Publications,1998.
4. S.B. Lippman; C++ Primer; Addison Wesely, 1995 ; (Third Edition).
5. Stastroup; The Elements of C++ Programming; Addison Weiley
       Publication, 1995.

Paper S3.3: Software Engineering

Total Credit: 6
Total Marks: 100

UNIT I: **Introduction** **(Marks:15)**

Software Processes & Characteristics, Software life cycle

Models ---- Waterfall, Prototype, Evolutionary and Spiral Models

Software Requirements analysis & specifications: Requirement engineering, requirement, elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries, ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS.

UNIT II: **Software Project Planning** **(Marks:15)**

Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management.

UNIT III: **Software Design** **(Marks:15)**

Data design**,** Architectural design**,** Interface design, Function Oriented Design, Object Oriented Design, Cohesion & Coupling, Classification of Cohesiveness & Coupling,

Software Metrics: different types of project matrics.

UNIT IV: **Software Testing and Maintenance** **(Marks:15)**

Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing. Debugging Activities

Software Maintenance: Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation. Software quality Assurance.

CASE tools--- Analysis tools, design tools, SQA tools, software testing tools.

Suggested Readings:

1. Rajeev Mall ―Software Engineering‖ PHI

2. Pressman Roger ― Software Engineering A Practitioners Approach‖ Tata McGraw Hill

3. James F. Peters, Witold Pedrycz ―Software Engineering An Engineering Approach

SEMESTER IV

Paper S-4.1 Operating System
Total Credit: 6
Total Marks: 100

UNIT I: Introduction: **(Marks:8)**

What is an operating system, batch systems, multiprogrammed, time-sharing systems, personal-computer systems, parallel systems, distributed systems, real-time systems.

UNIT II: Processes: **(Marks:8)**

Process Concept, Thread, design issues of thread, user space thread and kernel space thread. Usage of thread. Process states, Operation on Processes:- creation and termination. Implementation of process:- process table.

UNIT III: Process Synchronization: **(Marks:8)**

Race condition, Critical-Section, mutual exclusion. Solution to race condition and synchronization: - disabling interrupt, test-and-set-lock, Peterson's solution, semaphore, mutex, monitor, message passing. Classical problems:- The Dining philosopher, sleeping barber and readers-and-writers (bounded buffer) problems and their solution.

UNIT IV: Scheduling   **(Marks:6)**

Basic Concepts, preemptive and non preemptive scheduling. Scheduling Algorithms. Types of scheduling: - batch, interactive and real-time. Goals of scheduling algorithms. FCFS, SJF, RR, priority, multiple queues, three-level scheduling.

UNIT V: Deadlocks: **(Marks:5)**

System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock. Banker's algorithm.

UNIT VI: Memory management: **(Marks:10)**

Multiprogramming. Address binding (relocation), and protection. Swapping. Virtual memory: - logical versus physical address space, paging, page fault, page table and its entries, demand paging, multi level page table, TLB, its entries and working. Page replacement algorithms: - LRU, optimal, NRU, FIFO, second chance, clock, NFU. Working set. What is segmentation, what are its benefits and drawbacks.

UNIT VII: File system   **(Marks:10)**

What is file, file naming, file types(directory, regular, device), sequential access and random access files, file attributes, operations on file, hierarchical directory structure, path name(relative and absolute), operation on directories, disk layout, disk partition, file system layout, disk block allocation:-contiguous allocation linked list allocation, FAT, i-nodes, directories in UNIX, file system security

UNIT VIII: I/O management   **(Marks:5)**

Basic principles and overall structure of I/O management subsystem, Device controllers, layers of the I/O subsystem:- interrupt handlers device driver, device independent I/O

software and user space I/O software.
Suggested reading:
1. Modern Operating System, Tanenbaum, PHI Publication.
2. Operating System by Galvin

Paper S-4.2 Programming in JAVA

Total Credit: 6
Total Marks: 100

UNIT-I : Java language basics (Marks:30)

Basic features, Java virtual machine concepts. Data types:- primitive data types and variables. Java Key words, integer and floating point data type, character and Boolean types, declaring and initialization variables. Java operators, Expressions, Statements-- selection statements, control statements, iterative statements, jump statements.

Classes & Objects

Creating objects, assigning object reference variables. Introducing methods.

Arrays

Static methods, Constructors, Overloading constructors., Strings, and Vector.
This Keyword , Using object as parameters:- argument passing, returning objects.
Method Overloading , garbage collection , the Finalize() method.

Inheritance and Polymorphism

Inheritance basics, access control, multilevel inheritance, method overriding, abstract classes, polymorphism, Final keyword.
Multithreaded programming,

I/O in Java

I/O basics, Streams and stream classes , reading from and writing to console, reading and writing files

UNIT – II Java applets (Marks:10)

The Applet Class, Applet Architecture, An Applet skeleton: initialization and termination, handling events, HTML Applet Tag, Control.

UNIT – III Networking (Marks:10)

Socket overview -- datagram socket and TCP/IP based server socket, Internet Addressing --- DNS, UR. Event handling Drivers in Java.

UNIT – IV Java Database Connectivity (Marks:10)

Establishing a connection(JDBC, ODBC connectivity) , transactions with database.

Suggested Reading

1. Programming in Java, E. Balaguruswamy, Tata Mc-Graw Hill.
2. Patrik Naughton & Herbert Schildt ― The complete reference java

Paper S-4.3: Mathematics

Total Credit: 6
Total Marks: 100

Unit1: Sets, Relations and Functions   **Marks 10**

Sets, relations, properties of binary relations, closures of relation, equivalence relations, equivalence classes and partitions. Partial ordering relations and lattices.Functions, onetoone and onto, principles of mathematical induction.

Unit2: Graph Theory   **Marks 10**

Basic Definition of graph. Connectivity of graph, cut points cycles, Hamiltonian graphs, trees, different Characterization of trees, bipartite graph, Algorithms on graph, Breadth first search, Depth first search.

Unit3: Combinatorics   **Marks 10**

Basic of counting principles, principle of inclusion exclusion, application of inclusion and exclusion. Pigeonhole principle, generalized Pigeonhole principle and its application, permutations and combinations, permutations with repetitions, combinations with repetitions, permutations of sets with indistinguishable objects.

Unit4: Matrices   **Marks 10**

Row and column operations, vectors and matrices, partitioning of matrices, representing relations using matrices, Determinant of a square matrix, minor, cafactor, the CayleyHamilton theorem, inverse of a matrix, product form of inverse. Rank of a matrix. Solutions of simultaneous linear equations, existence of solutions, solution by Gaussian elimination, Eigen values and Eigen vectors.

Unit5: Logic   **Marks 10**

Connectives, truth tables, normal forms CNF, DNF, Converting expressions to CNF and DNF, Theory of inference, Prepositional calculus. Boolean Algebra. Predicate calculus (only introduction), predicates and quantifiers.

Unit6: Vector Space   **Marks 10**

Definition and examples of vector spaces. Elementary properties of R as a vector space. Subspaces of a vector space. Union, intersection and sum of two subspaces. Subspaces generated by a subset of a vector

space. Definition, example and properties of linearly independent and dependent set of vectors. Basis and dimension of a vector space. Examples of finite dimensional vector spaces.

Suggested Readings :

1. Discrete Mathematical Structure, Kolman /Rahman Peason Education.

2. Discrete Mathematics and its Applications, K. H. Rosen, Mc-Graw Hill International Ed.

3. Discrete Mathematics structures with applications to Computer Science, J. P. Tremblay and R.Manohar, Mc-Graw Hill.

4. Discrete Mathematics, N. Ch. S.N. Iyengar, K. A. Venkatesh, V. M. Chandrasekaran, P. S. Arunachalam,

SEMESTER V

Paper S-5.1: Computer Network
Total Credit: 6
Total Marks: 100

UNIT-I   (Marks:10)

Physical Layer : Data communications : components – Network criteria – physical structures – network models – categories of networks –interconnection of networks – inter network Protocols and standards : protocols-standards-standards organizations- internet standards Network models: Layered tasks – OSI model – layers in the OSI model – TCP/IP protocol suite.

UNIT – II   (Marks:10)

Digital Transmission: Digital to digital conversion: Line coding – line coding schemes – block coding - analog to digital conversion – PCM - transmission modes: serial transmission – parallel transmission
Analog Transmission: Digital to analog conversion: FSK-ASK-PSK Analog to Analog conversion: Amplitude modulation – Frequency modulation – phase modulation
Multiplexing: Frequency division multiplexing – Time division multiplexing –
Transmission Media Guided media: Twisted pair cable – coaxial cable – fiber optic cable Unguided media: radio waves - micro waves – infrared.

UNIT–III   (Marks:10)

Data Link Layer: Error correction and detection: Introduction- block coding-linear block codscyclic codes-checksum. **Data link Control:** protocols-simplest protocol- stop and wait protocol- stop and wait automatic repeat request-go back n automatic repeat request-selective repeat-automatic repeat request-piggybacking. **MultipleAccess:** Random access-Aloha-CSMA-CSMA/CD-CSMA/CA Controlled access: reservation, polling, token passing. Channelization: FDMA,TDMA, CDMA.

UNIT–IV   (Marks:10)

Wired LANs: Ethernet: IEEE standards, standard Ethernet- fast Ethernet. **Wireless LANS:** IEEE 802.11-arhitecture-MAC sublayer addressing mechanism, physical layer-Bluetooth: architecture-Bluetooth layers-radio layer-baseband layer-L2CAP-other upper layers.
Network Layer:
AddressingIPV4 addresses - IPV6 Addresses
Internet Protocol: IPv4 –IPv6 **Address mapping protocols:** ARP – RARP.

UNIT-V   (Marks:10)

Routing protocols: Unicast routing protocols: distance vector routing, Link State routing **Multicast Routing protocols (Any two) Transport Layer:** Process to process delivery – UDP – TCP
Congestion control and QOS: Data traffic – congestion – congestion control – quality of service – techniques to improve quality of service.

UNIT – VI   (Marks:10)

Application layer: & Network Security :
DNS: Name space – domain name space – distribution of name space

Electronic mail Architecture –
FILE transfer: FTP **WWW and HTTP:** Architecture – web documents – HTTP
Network Security: Introduction - definitions – two categories - symmetric key cryptography – traditional ciphers – asymmetric key cryptography

SUGGESTED READINGS :

1. Behrouz A Forouzan, *Data communication and networking*, McGraw-Hill, 5

Paper S-5.2: System Administration Using LINUX

Total Credit: 6
Total Marks: 100

Unit I : **(Marks:15)**

What is System Administration? Duties of a System Administrator. Basic features of the Linux operating system. Installation requirements,Partioning the Hard drive in Linux, Installing the Linux system, installing and configuring softwares in linux,Linux kernel program, system Startup and Shutdown. Standard I/O,Standard error,redirection and piping.

Unit II : **(Marks:15)**

Basics of Linux file system: hierarchy and types. absolute and relative path names.Basic commands for files and directories- ls,cp,mv,rm,mkdir,rmdir,more,creating and viewing files, mounting and unmounting file systems and partitions. Structure of /etc/fstab file and its purpose. I-node, directories, hard link, symbolic link. setting user and group ownership of files and access permissions, study of different linux shells (sh, bash, csh, zsh). Environment variable. Bash variables, login vs non-login shells. Shell script basics. Introduction to grep, awk, perl **)**

Unit III : **(Marks:10)**

Basic commands for starting and stopping processes, basic process attributes and their rolein access control. Examining the list of running processes on the system and understand the data presented there. Background process,Sending signals to processes and modifying process priorities. Job control. Crontab file format, Backup and Restore procedure, configuring the print queue, selecting the printer driver, editing the printer configuration, deleting printer setting default printer.

Unit IV : **(Marks:10)**

Managing user accounts: Adding a user,password,Creating Groups,adding and deleting groups,viewing user account information, understanding the "root' account, implementing sudo. What is file ownership and access permission,**,**System monitoring and logging,Monotoring memory usage, disk space usage and I/O activity. Logging and its necessity, Customizing ststem Log information.

Unit V: **(Marks:10)**

The rules governing IP address classes and netmasks, Network Address,Netmask and Gateway.configuring Interface with ifconfig,adding routes, ping,netstat,traceroute,telnet,Understanding the significance of the /etc/services file and well

known port numbers. Basics of configuring NFS, NIS, DNS, FTP, Squid Proxy,DHCP server,iptables and firewall.Basic Network Security Issues.

Suggested Readings

1. Red Hat Linux:Proffitt:PHI
2. Introduction to system Administration:IBM series:PHI
3. Essential System Administration:Frisch:O'REILLY

Paper S-5.3: Mini Project (Total Marks 100)

SEMESTER VI

Paper S-6.1: Android Application Development

Total Credit: 6
Total Marks: 100

UNIT 1: Introduction to Android. Smartphone features.   **(Marks:5)**

UNIT 2: Installing the SDK. Creating Android Emulator. Installing Eclipse. Installing Android development tools. Choosing which Android version to use**.**   **(Marks:10)**

UNIT 3: Android Life cycle. Android applications structure.   **(Marks:5)**

UNIT 4: Creating a project. Working with android manifest.XML Various controls. Layouts **(Marks:5)**

UNIT 5:	Text controls	**(Marks:5)**
	Button controls	
	Images	
	Supporting Multiple Screen	
UNIT 6:	Activities.	**(Marks:5)**
	Application context.	
	Intent	
	WebView.	
UNIT 7:	List View.	**(Marks:5)**
	Spinner	
	AutoComplete Textview.	
	Multi Auto Complete Textview.	
UNIT 8:	Toast.	**(Marks:5)**
	Dialogue Notification.	
	Statusbar Notification.	
UNIT 9:	Option Menu.	**(Marks:5)**
	Context Menu.	
	Google Map.	

UNIT 10: File . Shared Preferences. Database (SQLite database) ,Creation of .apk files.   **(Marks:5)**
UNIT 11: Web services. HTTP client.   **(Marks:5)**
                   XML and JSON.

Paper S-6.2: Database Design and Programming

Total Credit: 6

Total Marks: 100

UNIT I: **Introduction to database design**   **(Marks:15)**

Software development life cycle (software development cost, structures system analysis and design, structured system analysis, structured design), Database development life cycle(DDLC), Database design approach (Bottom-up, top-down, inside-out, mixed strategy).

Phases of database design – Data requirement collection & analysis, conceptual database design, DBMS selection, logical & physical database design, prototyping, database implementation and tuning .

UNIT II: **DBMS architecture**   **(Marks:15)**

Centralized DBMS architecture, Basic client server architecture. Two-tier client server architecture, Three tier client/server architecture for web application.

Issues in application development : Transaction concepts (execution and problems) Concurrency control (problems, degree of consistency, permutable action, schedule, serializable schedules, locking methods for concurrency control.

UNIT III: **Database security**   **(Marks:15)**

Introduction, goals of database security. Discretionary access control (Granting /Revoking privileges, Audit trials), Mandatory access control, Firewalls, Authorization and authentication.

UNIT IV: **Introduction to SQL and database programming**   **(Marks:15)**

Specifying constraints, Complex SQL queries, views (virtual tables in SQL), concept of cursor and triggers. Stored procedure, transactions and cursors.

Issues and techniques, Approaches to database programming. Typical sequence of interaction in database programming. Embedded SQL, Dynamic SQL and SQLJ: Retrieving single tuple with embedded SQL, Retrieving multiple tuples with embedded SQL using Cursors , Specifying queries at runtime using dynamic SQL, Embedding SQL commands in JAVA, Retrieving multiple tuples in SQLJ using Iterators. Database programming with function calls SQL/CLI and JDBC:SQL function calls for JAVA programming.

Suggested Readings:

1. Fundamentals of database management system by Elmasri and Navathe, Pearson Ed.

2. MySql for professionals by Ivan Bayross

3. Database System Concepts by Silberschatz, Korth and Sudarshan, Mc-Graw Hill.

Paper S-6.3: Major Project (Total Marks 100)