UNIVERSITY OF MYSORE

Estd. 1916

NO: AC2(S)/ 402/2013-14   Dated: 08-01-2015.

Notification

Sub: Amendment to the existing regulation of B.C.A course (Project report) reg.
Ref: 1. Letter from Chairperson, BOS in Computer Science (Graduate), MGM, Mysore,
      Dated: 11-09-2014.
    2. Decision of the Academic Council meeting held on 03-11-2014.

     The Chairperson Board of Studies in Computer Science (Graduate), in his letter cited vide reference (1), has recommended amendment to the existing revised regulation of BCA course as follows.

Existing	Amendment	Remark
Minima for a pass in each paper and aggregate and condition for promotion to next higher class: A candidate has to get a minimum of 40% in every paper (Including IA). However a candidate has to obtain a minimum of 28 out of 80 in the semester-end examination in every paper. Examination will be conducted for both odd and even semesters at the end of every semester. The complete carryover system is permitted except when the candidate is detained for the attendance requirement. However before the candidate enters the 6th semester, the candidate should have completed all papers up to the end of 4th semester successfully and before submitting the final project report, the candidate should have completed all semesters up to the end of 5th semester.	**Minima for a pass in each paper and aggregate and condition for promotion to next higher class:** A candidate has to get a minimum of 40% in every paper (Including IA). However a candidate has to obtain a minimum of 28 out of 80 in the semester-end examination in every paper. Now Examinations will be conducted for odd to odd and even to even semesters at the end of every semester. Hence the complete carryover system is permitted except when the candidate is detained for the attendance requirement.	That the earlier condition stating that the candidates should have cleared all the papers from 1st to 4th semester for project enrolment and 1st to 5th semester for project submission is relaxed, Hence the students can enroll for project work during the 6th semester and can submit their reports irrespective of their previous semester results.

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The Academic Council at its meetings held on 03-11-2014 has approved the above proposals and the same is hereby notified. This will come in to effect from the academic year 2014-15.

Registrar 08/01/15

1. The Registrar (Evaluation), University of Mysore, Mysore.
2. The Chairperson, BOS/DOS in Computer Science, MGM, Mysore.
3. The Dean, Faculty of Science & Technology, DOS in Zoology, MGM, Mysore.
4. The Principals of the Affiliated Colleges running B.C.A course.
5. Prof. Nagabushan.P. CBCS-Chief nodal officer, DOS in Computer Science, MGM, Mysore.
6. The Director, College Development Council, UOM, Mysore
7. The Deputy/Assistant Registrar (Evaluation), University of Mysore, Mysore.
8. Sri Narasimha Murthy, Statistician, E.B. UOM, Mysore.
9. The Supdt. AC.1 & AC.2, A.B., Academic Section /PMEB, UOM., Mysore.
10. The P.A. to the Vice-Chancellor/Registrar/Registrar(Evaluation), UOM., Mysore.
11. The Case Worker, AC.7, Academic Section, University of Mysore, Mysore.
12. The Section Guard File(Supdt.AC.2), A.B., A.C., UOM.
13. The Schedule File.

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UNIVERSITY OF MYSORE

Estd. 1916

VISHWAVIDYANILAYA KARYA SOUDHA
CRAWFORD HALL, POST BOX NO. 406
MYSORE-570 005

No.AC.2(S)/507/12-13   Dated: 01-06-2013.

NOTIFICATION

Sub: Revision of the Syllabus of B.C.A. (Bachelor of Computer Application)

Ref: 1. Proceedings of Faculty of Science & Technology Meeting held on 21-02-2013.
2. Proceedings of the Meeting of Academic Council held on 27-03-2013.

    The Board of Studies in **Computer Science (UG)** at its meeting held on 21-12-2012 has resolved to revise the syllabi of B.C.A. Bachelor of Computer Application to be effect from the academic year 2013-14.

    The Faculty of Science and Technology and the Academic Council at their meetings held on 21-02-2013 and 27-03-2013 respectively approved the above proposals and the same is hereby notified.

    The copy of Revision of the Syllabus of B.C.A. Bachelor of Computer Application is annexed herewith.

S. Sampous
REGISTRAR.

To

1. The Registrar (Evaluation), University of Mysore, Mysore.
2. The Chairperson, BOS/DOS in Computer Science, MGM.
3. The Dean, Faculty of Science & Technology, DOS in Zoology, MGM.
4. The Principals of the Affiliated Colleges running B.Sc. course.
5. The Director, College Development Council, UOM, Mysore
6. The Deputy/Assistant Registrar (Evaluation), University of Mysore, Mysore.
7. Sri Narasimha Murthy, Statistician, E.B. UOM, Mysore.
8. The Supdt. AC.1 & AC.2, A.B., Academic Section, UOM., Mysore.
9. The P.A. to the Vice-Chancellor/Registrar/Registrar(Evaluation), UOM., Mysore.
10. The Case Worker, AC.7, Academic Section, University of Mysore, Mysore.
11. The Section Guard File(Supdt.AC.2), A.B., A.C., UOM.
12. The Schedule File.

AC2.Eng.25-4.R

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UNIVERSITY OF MYSORE
PROPOSED REVISED SYLLABI, REGULATIONS & SCHEME OF STUDY FOR BCA
2013-2014

Preamble:-

BSc., Computer Science and BCA syllabi had been framed and executed since from the academic year 2005 – 2006 and 2007 – 2008, respectively. After completion of 5 years of tenure and in tune with the industrial requirements, the Board of Studies has felt that, both the BSc Computer Science and BCA (Degree) syllabi has to be revised and put in to the effect from the academic year 2013-2014.

1. **Eligibility for Admission (for BCA only):** Those candidates who have successfully completed +2 or PU or equivalent with Mathematics/Computer Science/Business Mathematics/Accountancy OR 3 years Diploma after SSLC/10th Class with Computer Science Engineering/Information Science Engineering or equivalent.
2. **Duration of the Course:** This is a 3 years program split into 6 semesters each of duration 4 months. However, the maximum duration permitted is 6 years from the date of admission as per the double the duration norm of the University of Mysore.
3. **Attendance requirement, progress and conduct:** As per the existing norms of the University of Mysore for other Bachelors' degree programme.
4. **Hours of instructions/week:** Shown in the Tables.
5. **Titles of papers/practicals etc:** Shown in the Tables.
6. **Scheme of Examination/Assessment:** Shown in the Tables.
7. **Minima for a pass in each paper and aggregate and condition for promotion to next higher class:** A candidate has to get a minimum of 40% in every paper (Including IA). However a candidate has to obtain a minimum of 28 out of 80 in the semester-end examination in every paper. Examination will be conducted for both odd and even semesters at the end of every semester. The complete carryover system is permitted except when the candidate is detained for the attendance requirement. However before the candidate enters the 6th semester, the candidate should have completed all papers up to the end of 4th semester successfully and before submitting the final project report, the candidate should have completed all semesters up to the end of 5th semester.
8. **Classification of the successful candidates:** Based on the sum total of the marks secured in all successfully completed papers from all six semesters, class will be awarded.
   a. If the sum total mark is equal to or more than 70% of the aggregate then the candidate is placed in Distinction class.
   b. If the sum total mark is equal to or more than 60% and less than 70% then the candidate is placed in First class.
   c. If the sum total mark is equal to or more than 50% and less than 60 % then the candidate is placed in Second class.
   d. Remaining successful candidates are placed in Pass class.
   e. Transitory Provision: Not applicable.
   f. Fee structure: As decided by the University of Mysore / Government from time to time.

UNIVERSITY OF MYSORE
BCA Syllabus
(Revised-2013-2014)

Semester-I

Subject Code	Title	Teaching	Teaching Hrs/Week		Duration of Exam (Hrs.)	Marks				
			Th.	Pr.		IA Max.	Th/Pr Max.	Total	Th/Pr Min.	Min. for Pass
1BCA1	Kannada / Other Language-I	Kannada / Concerned Dept.	04	-	03	20	80	100	28	40
1BCA2	English-I	English	04	-	03	20	80	100	28	40
1BCA3	Basics of Digital Electronics	CS	03		03	20	80	100	28	40
1BCA4	Mathematics	Math.	03		03	20	80	100	28	40
1BCA5	Computer Fundamentals & Problem Solving	CS	03		03	20	80	100	28	40
1BCA6	C Programming	CS	03		03	20	80	100	28	40
1BCA7*	Digital Electronics & Office Automation Lab	CS	-	06	03	20	80	100	28	40
1BCA8	C Programming Lab	CS	-	06	03	20	80	100	28	40
	Total		20	12				800		

*Among 6 hours of practicals, 3 hours will be allotted for Digital Electronics lab and 3 hours will be for Office Automation lab. The appropriate theory instruction for Office Automation should be given in the practical session only.

Semester-II

Subject Code	Title	Teaching	Teaching Hrs/Week		Duration of Exam (Hrs.)	Marks				
			Th.	Pr.		IA Max.	Th/Pr Max.	Total	Th/Pr Min.	Min. for Pass
2BCA1	Kannada / Other Language-II	Kannada / Concerned Dept.	04	-	03	20	80	100	28	40
2BCA2	English-II	English	04	-	03	20	80	100	28	40
2BCA3	Data Structures & Applications	CS	03		03	20	80	100	28	40
2BCA4	Discrete Mathematics	Math/CS	03		03	20	80	100	28	40
2BCA5	Operating System	CS	03		03	20	80	100	28	40
2BCA6	Accounting & Financial Management	Commerce	03		03	20	80	100	28	40
2BCA7	Data Structures Lab	CS	-	06	03	20	80	100	28	40
2BCA8*	Accountancy Lab & Web Designing Lab	CS	-	06	03	20	80	100	28	40
	Total		20	12				800		

* Among 6 hours of practicals, 3 hours will be allotted for Accountancy lab and 3 hours will be Web Designing lab. The appropriate theory instruction for Web Designing should be given in the practical session only.

Semester-III

Subject Code	Title	Teaching	Teaching Hrs/Week		Duration of Exam (Hrs.)	Marks				
			Th.	Pr.		IA Max.	Th/Pr Max.	Total	Th/Pr Min.	Min. for Pass
3BCA1	Kannada / Other Language-III	Kannada / Concerned Dept.	04	-	03	20	80	100	28	40
3BCA2	English-III	English	04	-	03	20	80	100	28	40
3BCA3	Computer Architecture & Microprocessor	CS.	03		03	20	80	100	28	40
3BCA4	OOPS with C++	CS.	03		03	20	80	100	28	40
3BCA5	Software Engineering	CS	03		03	20	80	100	28	40
3BCA6	DBMS	CS	03		03	20	80	100	28	40
3BCA7*	Microprocessor Lab & Unix Lab	CS.	-	06	03	20	80	100	28	40
3BCA8	C++ Lab	CS	-	06	03	20	80	100	28	40
	Total		20	12				800		

*Among 6 hours of practical class 3 hours will be allotted for Microprocessor Lab and 3 hours will be Unix Lab. The appropriate theory instruction for UNIX lab should be given in the practical session only.

Semester-IV

Subject Code	Title	Teaching	Teaching Hrs/Week		Duration of Exam (Hrs.)	Marks				
			Th.	Pr.		IA Max.	Th/Pr Max.	Total	Th/Pr Min.	Min. for Pass
4BCA1	Kannada / Other Language-IV	Kannada / Concerned Dept.	04	-	03	20	80	100	28	40
4BCA2	English-IV	English	04	-	03	20	80	100	28	40
4BCA3	Data Communication and Computer Networks	CS	03		03	20	80	100	28	40
4BCA4	Computer Oriented Numerical Analysis & Statistical Methods	CS	03		03	20	80	100	28	40
4BCA5	Data Warehousing & Data Mining	CS	03		03	20	80	100	28	40
4BCA6	Computer Graphics	CS	03		03	20	80	100	28	40
4BCA7	Numerical Analysis & Statistics Lab	CS	-	06	03	20	80	100	28	40
4BCA8	Visual Programming* & DBMS Lab	CS	-	06	03	20	80	100	28	40
	Total		20	12				800		

*The appropriate theory required for Visual Programming should be taught in the concerned practical session.

Semester-V

Subject Code	Title	Teaching	Teaching Hrs/Week		Duration of Exam (Hrs.)	Marks				
			Th.	Pr.		IA Max.	Th/Pr Max.	Total	Th/Pr Min.	Min. for Pass
5BCA1	Constitution of India*	Concerned Dept.	03	-	03	20	80	100	28	40
5BCA2	Environmental Studies*	Concerned Dept.	03	-	03	20	80	100	28	40
5BCA3	Java	CS	03		03	20	80	100	28	40
5BCA4	Operation Research	CS	03		03	20	80	100	28	40
5BCA5	Elective – I	CS	03		03	20	80	100	28	40
5BCA6	Elective – II	CS	03		03	20	80	100	28	40
5BCA7	Java Lab	CS	-	06	03	20	80	100	28	40
5BCA8	Operation Research Lab & ASP Lab	CS	-	06	03	20	80	100	28	40
	Total		18	12				*800 / 600		

*Marks secured in the subject ―Constitution of India" and ―Environmental Studies" will not be considered for awarding class.

Elective-I		Elective-II	
Subject Code	Title	Subject Code	Title
5BCA51	Multimedia	5BCA61	Image processing
5BCA52	Computer System Security	5BCA62	Computer Animation
5BCA53	C#	5BCA63	System software

Subject Code	Title	Teaching	Teaching Hrs/Week		Duration of Exam (Hrs.)	Marks				
			Th.	Pr.		IA Max.	Dissertation	Viva	Project Min.	Min. for Pass
6BCA1	Project Work	CS	-	24	03	60	100	40	28	40
	Total		-	24			200			

Project Guide Lines

- *Maximum 2 students shall be allowed to take up a project.*
- *Each student will have to work for 24 hours per week whether in the college premises or outside. If a student opts for industrial outside project, a college teacher has to be an internal guide. In this case the student has to report/present his/her progress twice in a week.*
- *Guiding one project shall be considered as 4 hours of practical per week as the work load for the concerned internal guide.*
- *Each student shall submit his/her project synopsis to the concerned guide within 15 days in consultation with internal guide from the commencement of the respective semester.*
- *Each student has to carry out 2 project seminars compulsorily in project duration.*
- *Each seminar will be considered for their internal assessment.*

Scheme of valuation   - 200 Marks

- **IA – 60 Marks**
    - o Synopsis   -   **20 Marks**
    - o Seminar 1 -   **20 Marks**
    - o Seminar 2 -   **20 Marks**

- **Dissertation – 100 Marks**
    - o Documentation   - **40 Marks**
    - o Presentation / Demonstration - **60 Marks**

- **Viva- 40 Marks**

Note: During the practical examination maximum 5 projects have to be evaluated in a batch with an external examiner.

Pattern of Question paper for Theory Exam(for all the first 5 semesters)

Max. Marks: 80   **Duration: 03 hours.**

Part-A:

Answer 10 questions out of 12 questions.   Marks: 10 X 2 = 20

[Note: Among 12 Questions, 4 Questions from each Unit]

Part-B:

Answer 06 questions out of 9 questions.   Marks: 6 X 10 =60

[Note: Among 9 Questions, 3 Questions from each Unit, Question may have internal splitting]

Pattern of Question paper for Practical Exam(for all the first 5 semesters)

Max. Marks: 80   **Duration: 03 hours.**

Any One Experiment/Program From Each Part

Scheme of Part A:
        Procedure development + Implementation + Result (15+05+05) = 25

Scheme of Part B:
        Procedure development + Implementation + Result (20+10+05) = 35

                                                Viva = 20

                                                Total = 80

1BCA1: **KANNADA/OTHER LANGUAGE-I**

As per the syllabus recommended for the I Semester of Course B.B.M. **4Hrs/Week**

1BCA2: General English

4 Hrs/Week

UNIT-1

1. **Grammar and Vocabulary:** Review of elements of grammar & usage for effective communication – Parts of speech, Phrases, Clauses, Sentences – Pattern, Complex and Compound sentences, Transformation of sentences, Direct and Indirect speech; Synonyms, Antonyms.

UNIT-2

2. **Reading & Writing Skills:** Reading passages from Books, News Papers, Journals and writing them in concise forms. Exercises on Reading and Writing skills.

UNIT-3

3. **Personality Development:** Exercises focusing on vocabulary and communication skills, art of public speaking, preparation of Resume, facing of interviews, group discussion.

Reference Books:
1. Current English for colleges by N. Krishnaswamy.

1BCA3: Basics of Digital Electronics

Unit-I   **14 Hours**
Number Systems – Introduction- Decimal, Binary, Octal and Hexadecimal. Inter- Conversions, Addition, Subtraction, Multiplication and Division in Binary Number System.
1's and 2's Complement method in Binary Number System. Subtraction using 1's and 2's Compliment, Weighted Number System - Binary Coded Decimal (BCD), Addition of BCD Numbers.
Non-Weighted Number System – Applications, Excess-3, Gray code
                                - Conversions - Gray and Binary Codes
Fixed point and Floating point representation of numbers - Introduction

Unit-II   **14 Hours**
Boolean Algebra: Basic laws, DeMorgan's theorem, Duality theorem, Sum Of Product method and Products Of Sum method. Karnaugh map (Upto 4 Variables, Don't Care Condition).
Fundamentals of Gates: Basic gates, Derived gates and Universal gates (Design).

Unit-III   **14 Hours**
Combinational and Sequential logic circuits - Half adder, Full adder, Half -subtractor and Full-subtractor.
Flip-Flops - SR, D, JK, JK Master Slave, T Flip-flops, Decoders - 3 to 8 lines, Encoders-Octal to Binary
Multiplexer- 4 to 1 line, Counters-3 bit Binary Ripple counter,3 bit synchronous binary counter.
Shift registers- Serial-In-Parallel-Out, Parallel-In-Serial-Out, Serial-In-Serial-Out, Parallel-In-parallel-Out.

Reference Books:

1. Digital fundamentals-Thomas.D.Floyd.
2. Malvino Leach, digital principles and application (4th edition)
3. Morris Mano, Computer System Architecture (3rd edition) PHI.
4. Digital Logic- Thomas C Bartee.

1BCA4: Mathematics

UNIT-I

Partial fractions: Proper & improper fractions-all four types.

Logarithms: All problems, except common logarithms.

Mathematical Induction: Simple problems on all types.

Theory of equations:
   i)   Solutions of cubic, bi quadratic equations when complex and irrational roots are given
   ii) Solutions of cubic , bi quadratic equations when roots are in AP, GP and HP.
   iii) Solutions of cubic, bi quadratic equations using synthetic division.
   iv) Operations on complex numbers.

Binomial Theorem: No proof.
   i)   Expansion - problems thereon.
   ii) Finding middle terms.
   iii) Finding constant terms or terms independent of x.

Trigonometry:
   i)   Definition of radian (no proof for constant angle)
   ii) Problems on conversion of radians to degree and vice versa
   iii) Problems on $s = r\theta$, $s = \frac{1}{2}r^2\theta$ (no proofs)

Trigonometric functions and identities:
Simple problems

Graphs of Trigonometric functions: for sine, cos and tan functions.
Allied angles: Problems thereon

Complex numbers:
   i)   Finding modulus and amplitude of complex numbers
   ii) Solving problems using Domoivre's Theorem.

UNIT II

Analytical Geometry
   i)   Problems on distance formula - Proving parallelogram, square, rhombus, equilateral triangle, Co linearity.
   ii) Problems on section formula - internal division , external division , mid point formula, centroid of a triangle.
   iii) problems on area of a triangle.

Straight lines:
   i)   By finding slopes - show that lines are parallel and perpendicular.
   ii) Finding slopes - when two points are given
   iii) equation of straight lines - passing through given point, parallel and perpendicular to given line.
   iv) Problems on intercept form , slope form , normal form , two point form.
   v)   Problems on angle between two lines.
   vi) Concurrency of three lines and point of concurrency.

Pair of lines
   i)   Angle between two lines $ax^2 + 2hxy + by^2 = 0$. $ax^2 + 2hxy + by^2 + 2gx + 2fy + C = 0$.
   ii) Point of Intersection.
   iii) Condition for an equation to represent pair of lines.

Circles:
i) Finding centre and radius.
ii) Finding equation of a circle passing through three points, when different conditions are given, passing through x and y- axis.

Conics : Parabola -
Finding vertex, focus, tangent, normal, length of latus rectum, eccentricity. (no proofs)

UNIT III
Limits and continuity:

i) Simple direct problems on limits of the form $\left(\dfrac{x^n - a^n}{x - a}\right)$, $\dfrac{\sin\theta}{\theta}$, $\dfrac{\tan\theta}{\theta}$ (no determinate forms).

ii) Simple problems on continuity.

Differentiation:
i) Problems on sum , product, quotient, chain rule (No parametric, logarithmic functions)

Differential Equations:
Solving problems by variable separable form.

Integration:
i) By substitution
ii) By parts
iii) By partial fractions
iv)   Problems of types

$$\int \frac{dx}{a^2 + x^2}, \int \frac{dx}{a^2 - x^2}, \int \frac{dx}{x^2 - a^2}, \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{\sqrt{a^2 + x^2}}, \int \frac{dx}{\sqrt{x^2 - a^2}}, \int \frac{dx}{x\sqrt{x^2 - a^2}}, \int \frac{dx}{x\sqrt{x^2 + a^2}}$$

$$\int \sqrt{a^2 - x^2}\,dx, \int \sqrt{a^2 + x^2}\,dx, \int \sqrt{x^2 - a^2}\,dx.$$

$$\int \frac{dx}{ax^2 + bx + c}, \int \frac{dx}{\sqrt{ax^2 + bx + c}}$$

Application of Integration:
Simple problems on area
i) Find the area of circle, ellipse, parabola & the ordinate x=a by integration
ii) Find the area bounded by the parabola $y^2 = 4ax$, x – axis and x = 1, x = y.
iii) Find the area bounded by y = sin x, x - axis & x = 0, y = z.

Reference Books:

1. Theory and Problems in Mathematics – I By BOSCO Publications 2004.
2. Theory and Problems in Mathematics – II By BOSCO Publications 2005.
3. Engineering Mathematics, Volumes I–IV By S Chandrashekar.

1BCA5: Computer Fundamentals & Problem Solving

UNIT-I   **14Hours**

Introduction to Computers
History, Generations of Computers
Computer as multipurpose tool - Overview of the Computer system, Applications of computer, looking inside the machine, parts of the computer, information processing cycle, computer shapes and types of computer.

Interacting with Computer
The Keyboard - the mouse - other input devices - The monitor - Printers - Sound systems - Connecting I/O devices to the Computer.

Storing information in a Computer
Types of storage devices - Magnetic storage devices, Optical Storage devices, measuring device performance.

UNIT-II

Processing Data   **14Hours**
Transforming data into information - How a Computer processes data - factors affecting processing speed

Computer Software
Computer Languages, Types of Software, Operating System-Introduction, Types of Operating System. Translators

Problem solving aspects – Introduction, Problem definition, Problem analysis, Design of problem solution, Algorithm, Flowchart, Coding, Debugging, Program Documentation and Program maintenance, Basic programming constructs - sequence, selection and iteration.

UNIT-III   **14Hours**

Information System
What is an information System - types of information Systems — System development life cycle.

Database Management systems
Data and Information - the database - DBMS relationship-working with a database - creating tables - Editing records -querying database - generating report.

Computers in Business
Why businesses need information — Types of business Software - Evolution of business computing

Security
The Need for Computer Security, Basic Security Concepts, Threats to Users, Threats to Hardware, Threats to Data, Taking protective measures – Protecting Yourself, Protecting your privacy, Keeping your Data Secure.

Reference Books:

1. Peter Norton's 'Introduction to Computers', Second edition, TMH.
2. Dromey – How to solve it by computer –PHI
3. Computer Concepts and C Programming – P.B.KOTUR
4. Computer Fundamentals - P K Sinha, BPB

1BCA6: C Programming

UNIT-1   **14 Hours**

Overview of C

Importance of C, Sample C programs, Basic structure of C Programs, Programming style, executing a C Program.

Constants, Variables, and Data Types
Character set, C tokens, Keywords and identifiers, Constants, Variables, Data types, Declaration of variables, Assigning values to variables, Defining symbolic constants
Operators and Expression
Arithmetic of Operators, Relational operators, Logical operators Assignment operators, Increment and decrement operators, Conditional operator, Bit wise operators, Special operators, Arithmetic expressions, Evaluation of expressions, Precedence of arithmetic operators, Type conversions in expressions, Operator precedence and associatively, Mathematical functions.
Managing Input and Output Operations
Reading a character, writing a character, formatted input, formatted output

Unit-II   **14 Hours**

Decision Making and Branching
Decision making with IF statement, Simple IF statement, The IF ELSE statement, Nesting of IF ... ELSE statements, The ELSE IF ladder, the switch statement**, the ?:** Operator, The GOTO statement.
Decision Making and Looping
The WHILE statement, The DO statement, The FOR statement, Jumps in loops
Arrays
One-dimensional arrays, Two-dimensional arrays, Initializing two-dimensional arrays.
Handling of character strings
 Declaring and initializing string variables, Reading strings from terminal, Writing strings to screen, Arithmetic operations on characters, Putting strings together Comparison of two strings, String-handling functions, Table of strings

UNIT-III   **14 Hours**

User-Defined Functions
Need for user-defined functions, multi-function program, The form of C functions Return values and their types, Calling a function Category of functions, Handling of non-integer functions, Nesting of functions, Recursion, Functions with arrays, The scope and lifetime of variables in functions.
Structures and Unions
Structure definition, giving values to members, Structure initialization Comparison of structure variables, Unions, Size of structures
Pointers and File Handling
Understanding pointers. Accessing the address of a variable, Declaring and initializing pointers, Accessing a variable through its pointer.
File Handling– Definition and need of file. Defining, Opening, and Closing a file. Input and output operations on files. Random access to files with example programs.

Reference Books:

1. Problem Solving with C, M.T. Somashekara, PHI Learning, New Delhi, 2009
2. Programming in ANSI C 2nd Edition by E Balaguruswamy Published by Tata McGraw Hill.

1BCA7: Digital Electronics and Office Automation Lab

List of Experiments/Programs

Part A:

1. Using Ms-Word with suitable examples, write the steps and execute the following with respect to table handling
   i.   Creating a table (At least 4 Columns and 6 Rows).
   ii. Entering appropriate data into the table.
   iii. Sort the table.
   iv. Apply the formulas on table numeric values.

2. Using Ms-Word write the steps and execute for creating ―Mail Merge" document for ―FORM LETTERS".

3. Using Ms-Excel spread sheet, with suitable example, write steps and create worksheet called ―Employee" and calculate the following using formulas
   i.   Enter Employee Code, Name and Basic Salary.
   ii. Calculate DA (20% of Basic Salary).
   iii. Calculate HRA (10% of Basic Salary).
   iv. Calculate CCA (8.5% of Basic Salary).
   v.   Calculate Total Salary (Basic Salary + DA + HRA + CCA)
   vi. Calculate Deductions (10% of Total Salary).
   vii. Calculate Net Salary (Total Salary – Deductions).

4. Using Ms-Excel draw X-Y Line Chart and Bar Charts based on the following worksheet data and write the steps

ITEM	MONTHLY SALES (in Thousands)
Cotton	2,750
Wool	3,100
Yarn	2,975
Jute	2,100
Fiber	3,010

5. Using Ms-Excel spreadsheet write the steps and execute the following:

Roll No	Stud Name	Marks1	Marks2	Mark3	Total	Percen-tage	Result

   i.   Create appropriate records
   ii. Calculate total and marks using formula.
   iii. Update result column using IF function.
        (Result: Distinction, First Class, Second Class, Pass, Fail).

6. Using Ms-Access with suitable examples write steps and execute the following.
   i.   Create STUDENT database table.
   ii. Create appropriate records.
   iii. Add two more records to the table.
   iv. Delete 2nd record to the table.
   v.   View the records.

7. Using Ms-Access with suitable examples write steps and execute the following.
    i. Create EMPLOYEE database table.
    ii. Create appropriate records.
    iii. Sort the records in ascending order of name.
    iv. Sort the records in descending order of salary.
    v. View the records

8. Using Ms-PowerPoint with suitable examples write steps and execute the following:
    i. Create presentation slides with Titles, Sub Titles and Charts choosing different slide layouts.
    ii. Use Design templates for background.
    iii. Format the slide design.

9. Using Ms-PowerPoint with suitable examples write steps and execute the following:
    i. Create presentation table slides using an organization chart.
    ii. Use different views such as slide view, slide sorter view and slide show view.

Part B:

1. Verification of Basic Gates (OR, AND, NOT) and EX-OR, EX-NOR.

2. Verification of Other Gates using only NAND Gates (Universal Gate).

3. Verification of other Gates using only NOR Gates (Universal Gate).

4. Realization of Boolean expression using NAND gates only.

5. Construction of Half Adder and Full Adders.

6. Construction of Half Subtractor and Full Subtractors.

7. Simplification of Boolean Expressions using Karnaugh Map method.

8. Implementation of SR, Clocked SR Flip Flops.

9. Implementation of JK, Toggle and Delay Flip Flops.

10. Shift Left and Shift Right Registers.

11. 4 bits Gray to Binary and Binary to Gray Converter.

12. Decimal to BCD encoder and BCD to decimal decoder.

1BCA8: C Programming Lab

List of Experiments/Programs

Part A:

1. C program for given two numbers to perform arithmetic operations using switch statement.
2. C program to find biggest of three number using nested if statement.
3. C program to find sum of the $S=1^2+2^2+3^2+\ldots\ldots\ldots+n^2$ indirect method using looping statement
4. C program to find sum of the $S=1-2+3-4+5\ldots\ldots\ldots+n$ series by indirect method using looping statement
5. C program to find sum of the $S=1+1/x+1/x^2\ldots\ldots\ldots\ldots$ series upto 4 decimal places of accuracy.
6. C program to check whether the given number is prime or not.
7. C program to print and count prime numbers from 2 to n.
8. C program to generate Fibonacci series up to n numbers
9. C program to check whether the given number is factorial of a number or not
10. C program to convert binary number to decimal number.
11. C program to convert decimal number to binary number.
12. C program to find the roots of the quadratic equation using else if statement.
13. C program to find the reverse of the given number. Also sum & count the number of digits and check whether the given number is palindrome or not palindrome
14. C program to find largest and smallest of n numbers
15. C program to find second largest and second smallest of n numbers

Part B:

1. C program for sorting given set of numbers using bubble sort technique.
2. C program to search given number using linear search technique
3. C program to accept two square matrix and find sum of two matrices.
4. C program to print difference of two matrices.
5. C program to accept two matrices of order m*n and p*q to find product of two matrices using function.
6. C program to check whether given number is Fibonacci or not.
7. C program to accept m*n matrix. To find trace and norm of square matrix and to print principle diagonal elements.
8. C program to accept m*n matrix to find sum of upper diagonal and lower diagonal elements.
9. C program to find factorial of a number using recursive function
10. C program to find NCR and NPR using function.
11. C program to find LCM and GCD of two numbers.
12. C program to display transpose of given m*n matrix using function.
13. C program to swap two numbers using function and pointers.
14. C program to accept employee information and display the same using structure.
15. C program to create simple marks card assuming appropriate condition
16. C program to read and write information of an employee using a file.

II SEMESTER

2BCA1: KANNADA/OTHER LANGUAGE-II

As per the syllabus recommended for the II Semester of Course B.B.M. / B.Sc / BA   **4Hrs/Week**

2BCA2: Technical English & Business Communication

UNIT-1   **12 Hours**

1. **Technical Report Writing:** Collection of data, planning and organization. Technical paper writing, project preparation and project report.

UNIT-2   **16 Hours**

2. **Introduction to Communication:** Principles of communication, Objectives of communication, media of communication, types of communication, barriers of communication.

UNIT-3   **17 Hours**

3. **Business Communication:** Kinds of business letters, Layout of business letters, Letters enquiries & replies, orders & execution credit, status inquiries, complaint and adjustment, collection letters, circular letters, sales letters, bank correspondence, application letters, E-mail, On-line marketing.

Reference Books:
1. Essentials of Business Communication by Rajendra Pal & Korla.

2BCA3: Data Structure and Algorithms

UNIT-1   **14Hours**

Linear Data Structure and their sequential storage representation

Introduction to algorithm- Sequential, Selection and Iteration

Algorithmic notations, Concept and terminology for non-primitive Data structures,

Arrays-Memory Representation of 1D and 2D, Operations on Arrays,

Stacks- Definitions and Concepts, Operations on stacks,

Applications of stacks- Recursion, Infix to postfix, and Evaluating postfix expressions,

Queues- Linear, Circular and Priority Queues

Unit – II   **14Hours**

Pointers and Linked Allocation, Linked linear lists,

Operations on Linear lists using singly linked storage structures

 (Insertion, Deletion, Searching-Only on unsorted lists),

Circular linked lists- Memory Representation ,

Doubly linked linear lists- Memory Representation.

Nonlinear Data Structures

Trees - Definition and concepts, Operations on Binary Trees,

Storage Representations of Binary Trees- Sequential and Linked, Tree Traversal,

Binary Search Tree- Creation and Traversal

UNIT-III   **14Hours**

Sorting and searching

Sorting- Selection sort, Bubble Sort, Insertion Sort, Merge Sort, Quick Sort, Radix sort

Searching- Sequential and Binary searching

Reference Books:
1. An Introduction to Data Structures with Applications 2nd edition - J.P.Trembly and Sorenson, McGraw Hill 2001.
2. Data structures using C , Aaron M Tenenbaum, Yedidyah   Langsam, Pearson
3. Data Structures And Program Design In C, Robert L Cruse, Pearson
4. Systematic Approach to Data Structures Using C by Padma Reddy

2BCA4: DISCRETE MATHEMATICS

UNIT-1   **14Hours**

Basics of Set Theory
Notation, Inclusion and Equality of Sets, The Power set, Operations on sets, Venn diagram, Set identities, Ordered pairs and Cartesian Products.

Relations and ordering – Properties of binary relations in a Set, Relation Matrix and the Graph of a Relation, Equivalence Relations, Compatibility Relations, Composition of Binary Relation.

Graph Theory
Basic Definitions, Paths and Connectedness, Matrix Representation of Graphs, Trees.

UNIT-2   **14Hours**

Functions
Definition and Introduction, Composition of Functions, Inverse Functions.

UNIT-3   **14Hours**

Mathematical Logic
Statements and Notation, Connectives, Negation, Conjunction, Disjunction, Statement Formulas and Truth Tables, Conditional and Bi-conditional, Tautologies, Equivalence of Formulas, Tautological Implications.

Reference Books:

1. Discrete Mathematical Structures with Applications to Computer Science by J.P. Tremblay, R Manohar 3rd Edition – Tata McGraw Hill.
2. Discrete mathematical structures by B. Kolman, R.C. Busby and S. Ross, 3rd edition.
3. Introduction to discrete mathematics by Liu, C.L., McGraw Hill, 2nd edition, 1985.
4. Discrete mathematics by S.A. Witala, McGraw Hill, 1987.

2BCA5: OPERATING SYSTEMS

UNIT-1   **14 Hours**

Introduction

Definition, Computer system components , User view , system view and system goals , Batch Systems, Multi programmed Systems, Time-Sharing Systems, Real-Time Systems, System Components, Operating system services, System calls and system programs.

Process

Process Concept, process state diagram process Control block , Process Scheduling- Scheduling queues, scheduler, Cooperating process, Interprocess Communication, Threads- meaning , user threads , Kernel Threads, Multithreading Models, Threading Issues,

CPU Scheduling

Basic concepts, Preemptive and Non-preemeptive Scheduling, Scheduling Criteria, Scheduling algorithms- FCFS, Shortest job first Priority scheduling, Round Robin Scheduling.

UNIT-II   **14 Hours**

Process Synchronization

The Critical section problem, Solution Approach critical section problem, Bakery Algorithm, Semaphores- Meaning, Types of Semaphores, Synchronization problems- Bounded Buffer Problem, Readers-Writers problem and Dining Philosophers problem.

Deadlocks

Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock

UNIT-III   **14 Hours**

Memory Management

Introduction, Logical versus physical address space, Dynamic Loading, Dynamic Linking, Swapping, Contiguous Allocation, Partitioned Memory Allocation, Paging, Segmentation, Segmentation with Paging.

Virtual Memory

Concept, Advantages of Virtual Memory, Implementation of Virtual Memory, Demand Paging, Demand segmentation, Advantages of Demand paging, Page Replacement, Page-Replacement Algorithms- FIFO Algorithm, Optimal Page Replacement Algorithm, and Least Recently used Algorithm, (LRU) Allocation of Frames, Thrashing.

File System

File concepts, File Attributes, File Operations, File Types, File Structure, Access Methods, Directory Structure, File-System Structure, Allocation Methods- Contiguous Allocation, Linked Allocation and Indexed Allocation, Free-Space Management.

Reference Books:

1. Operating System Concepts – 5th edition by Abraham Silberschartz and Peter Galvin, McGraw Hill, 2000
2. Modern Operating Systems – Andrew S Tanenbaum, Prentice Hall
3. Operating Systems : Internals and Design Principles, William Stallings, Prentice Hall

2BCA6: Accounting and Financial Management

UNIT-1   **14 Hours**
Accounting:
1. **Introduction:** Principles, concepts and conventions, double entry system of accounting, ledger keeping.
2. Subsidiary books with special reference to simple cash book and three column cash book.
3. **Trial balance and final accounts of sole trader:** Preparation trial balance, adjusting entries, including revenue for bad debts, revenue for discount on debtors and creditors, preparation of final accounts.
4. Final accounts of joint stock companies.

UNIT-2   **14 Hours**
Financial Management:
5. **Introduction:** Meaning and scope of financial management, functions of the financial manager.

6. **Ratio analysis:** Meaning of ratio, advantages, limitations, types of ratios and their usefulness, liquidity and ratios, profitability rations, efficiency ratios, solvency ratios, problems including preparation of balance sheet.
7. **Funds flow statement:** Meaning and concepts of funds, preparation of fund flow statement.

UNIT-3   **14 Hours**
Costing & Budgetary Control:
8. **Unit costing:** Preparation of cost sheet and tender price statement.
9. **Marginal costing:** Concepts, Marginal cost equations, P/V ratio, B.E.P., Margin of safety, Sales to earn a desired profit, Problems on the above.
10. **Budgetary Control:** Meaning and definition, preparation of flexible budget and cash budget.

11. **Standard costing:** Meaning of standard cost and standard costing, analysis of variances – material and labour variances only.

Reference Books:
1. Accountancy Vol. 1 by B.S. Raman.
2. Accountancy Vol. 2 by B.S. Raman.
3. Management Accounting by R.K. Sharma and Gupta.
4. Financial Management by I.M. Pandey.

2BCA7: Data Structures Lab

List of Experiments/Programs

PART – A

1. Write an interactive program to search an element in the given linear array using linear and binary searching technique.

2. Write a program to arrange numbers in ascending order using insertion sort.

3. Write a program to arrange numbers in ascending order using merge sort.

4. Write a program to arrange numbers in ascending order using selection sort

5. Write a program to arrange numbers in ascending order using quick sort

6. Write an interactive program to insert an element at the given position and delete an element at the specified position in the given array.

7. Write an interactive program to implement the following operations on stack

8. Program to implement Tower of Hanoi problem.

PART – B

1. Write program to evaluate a postfix expression.

2. Write a program to convert an expression from infix to postfix.

3. Write an interactive program to perform insertion and deletion operations in Linear Queue.

4. Write an interactive program to perform insertion and deletion operations in Circular Queue.

5. Write a program to delete an item from the linked list.

6. Write an interactive program to implement stack operations using singly linked list.

7. Write an interactive program to perform insertion operation in linked list- at the beginning, at the end and in-between.

8. Program to create a binary tree and also print the preorder values, inorder values, postorder values.

9. Write a Program to add two polynomials of one variable and _n' degree and represent them as linked list

2BCA8: Accountancy and Web Designing Lab

List of Experiments/Programs
PART-A

Problem 1: Enter the following transactions in the books of Wamtech Systems, the details are given below:-

1	1-4-07	Commenced business with cash	25000
2	2-4-07	Openned a/c in Vysya Bank	4000
3	2-4-07	Purchased goods from Vijay on credit.	5000
4	1-5-07	Sold goods to Shekhar for cash & discount allowed.	900 30
5	2-5-07	Sold goods to Raghu for cash.	700
6	1-6-07	Goods sold to Ramanujam on credit.	1000
7	2-6-07	Cheque received from Ramanujam	800
8	2-6-07	Cash paid to Vijaya	3000
9	1-7-07	Purchased goods from Jayavardhan on credit.	1000
10	2-7-07	Solds goods to Ravi on credit.	1000
11	2-8-07	Cash sales	600
12	1-9-07	Drew cash from bank for office use Chq.No. 1248	1200
13	2-9-07	Gave loan to Somanth	375
14	1-10-07	Purchased goods from Shan on credit.	450
15	2-10-07	Sold goods to Diwakar for cash.	620
16	2-11-07	Purchased goods from Sania on credit.	1700
17	1-12-07	Paid salary to office boy.	250
18	2-1-07	Purchased stationary for cash	35
19	1-2-08	Paid for general expenses.	72
20	2-2-08	Drew from bank for personal use chq no: 12468	900

Problem 2: Enter the following transactions in the books of Tech – Com Ltd.

1	1-4-07	Commenced business with cash	30000
2	2-4-07	Opened a/c in Canara Bank	5000
3	2-4-07	Purchased goods from Ravi on credit.	3000
4	1-5-07	Sold goods for cash & Discount allowed.	1200 200
5	1-6-07	Cash paid to Ravi.	2000
6	2-6-07	Sold goods to Subramanyam on credit.	5000
7	1-7-07	Cheque received from Subramanyam chq no:879654	5000
8	1-8-07	Cash purchase.	2000
9	2-8-07	Give loan to Vijaykumar	1000
10	1-9-07	Paid office rent	1500
11	2-9-07	Paid salary to office boy	1250
12	1-10-07	Purchased stationeries for cash	50
13	1-2-08	Cash sales	375
14	2-2-08	Paid for general expenses	150
15	1-3-08	Drew from bank for personal use chq no:13788	1200

Problem 3: Enter the following transactions in the books of Carlo soft drinks.

1	1-4-05	Commenced business with cash	20000
2	2-4-05	Opened a/c in Vysya Bank	3000
3	1-5-05	Purchased goods from Nagarjuna on credit.	4000
4	2-5-05	Sold goods to Pattabhi for cash &	800
		discount allowed.	50
5	1-6-05	Cash paid to Nagarjuna	3000
6	2-6-05	Sold goods to Sardesai on credit	4000
7	1-7-05	Cheque received from Sardesai chq no:54873	4000
8	2-8-05	Cheque purchase	2500
9	1-9-05	Gave loan to Guru Prakash	1000
10	1-10-05	Paid office rent	800
11	1-11-05	Paid salary to office boy	750
12	1-12-05	Purchased stationeries for cash	30
13	1-1-06	Cash sales	450
14	1-2-06	Paid for general expenses	225
15	1-3-06	Drew form bank for personal use chq no:28932	750
1	1-4-05	Commenced business with cash	20000
2	2-4-05	Opened a/c in Vysya Bank	3000
3	1-5-05	Purchased goods from Nagarjuna on credit.	4000
4	2-5-05	Sold goods to Pattabhi for cash &	800
		discount allowed.	50
5	1-6-05	Cash paid to Nagarjuna	3000
6	2-6-05	Sold goods to Sardesai on credit	4000
7	1-7-05	Cheque received from Sardesai chq no:54873	4000
8	2-8-05	Cheque purchase	2500
9	1-9-05	Gave loan to Guru Prakash	1000
10	1-10-05	Paid office rent	800
11	1-11-05	Paid salary to office boy	750
12	1-12-05	Purchased stationeries for cash	30
13	1-1-06	Cash sales	450
14	1-2-06	Paid for general expenses	225
15	1-3-06	Drew form bank for personal use chq no:28932	750

Problem 4: Record the following transactions in the book of Carlo Soft Drinks & maintain the proper accounts & inventory books.

Liabilities	Rs.	Assets	Rs.
Capital	372559.00	Cash	6816.00
		Indian Bank CA	25161.00
Sundry Crs:-			
Pepsi Co Ind Ltd.,	25410.00	**Deposites:-**	
Bisleri Ind Ltd.,	16540.00	Building Adv	15000.00
		Sales Tax Dep	1000.00
		Telephone Deposit	2000.00
		Fixed Assets:-	
		Auto rikshaw	40000.00
		Furniture	11000.00
		Sundry Debtors:-	
		Amar Enterprises	3241.00
		Cool Corner	3641.00
		Hotel Soundarya	6540.00
		Kwality Stores	8910.00
		Closing Stock	291200.00
	414509.00		**414509.00**

Details of closing stock:-

Stock Item	Qty (Btl)	Rate	Value		Stock Item	Qty (Btl)	Rate	Value
7UP	5500	8	44000		Pepsi	5800	8	46400
Bisleri 500ml	1800	6	10800		Bisleri 1lt	7300	12	87600
Mirinda	7300	8	58400		Slice	5500	8	44000

Current year transactions:-

1	1-4-08	Inv No. 254 for Rs. 5400 Pepsi purchased from Pepsi Co Ltd., Qty : 600 Btl. VAT @ 4%
2	2-4-08	Cr. Bill No: 001 Bisleri 1lt Qty: 1200 Btl @ Rs. 15/Btl & 7UP Qty. 720 Btl @ Rs. 10/Btl VAT @ 4% Sold to Hotel Soundarya.
3	1-5-08	Purchase order No. 001 Placed an order with Pepsi Co Ltd., due on 02-06-08 for 7UP qty. 720 Btl @ Rs. 8/Btl(VAT class 4%0
4	2-5-08	Inv No. 252 as per the purchased with Pepsi Co Ltd, due on 02-06-08 7UP Qty: 720 Btl @ Rs. 8/Btl. (VAT class 4%)
5	1-6-08	Indian Bank C/A chq No: 126 for Rs. 7035 issued to take DD in favour of Pepsi Co Ltd., DD charges Rs. 35
6	2-6-08	Cash received from Hotel Soundarya Rs. 8000
7	2-8-08	Cash bill No. 511 for Rs. 2700 furniture purchased from Hindustan Furniture Carting Rs. 250

8	2-8-08	Inv No. 112 Bisleri 1 Lt purchased from Bisleri India, Qty: 800 @ Rs. 12/Btl. VAT @ 4%
9	2-9-08	Indian Bank C/A Chq No. 128 for Rs. 15000 issued to Bisleri Ind.
10	1-10-08	Sales order No. 001 Pepsi to Amar Enterprises Qty: 1500Btl@ Rs. 10/Btl(VAT class 4%)
11	2-11-08	Cr. Bill No. 003 Pepsi sold to Amar Enterprises, against sales order No. 001 Qty: 1500Btl. @ Rs. 10/Btl. VAT @ 4%
12	2-12-08	Cash Bill No. 101 slice Qty: 900 Btl @ Rs. 10/Btl. Bisleri 500ml Qty: 1200Btl @ Rs. 15/Btl & Mirinda Qty: 500Btl @ Rs. 10/Btl. VAT @ 4% sold to Amar Enterprises.
13	1-1-09	Cash received from Amar Enterprises Rs. 5000.
14	2-1-09	Cr. Bill No. 004 Bisleri 1Lt sold to Royal Agencies, Qty: 2800Btl @ Rs. 15/Btl, 7UP Qty: 800 Btl @ Rs. 10/Btl, Mirinda Qty: 300Btl @ Rs. 10/Btl VAT @ 4%.
15	2-3-09	Purchase order No. 002 placed an order with Bisleri India Ltd., for 75Btl of Bisleri 1Lt
16	2-3-09	Inv No. 458 to Kashi Stores, sold pepsi Qty: 700Btl @ Rs. 10/Btl, Bisleri 500ml Qty. 20Btl Rs. 15/Btl VAT @ 4%

Problem 5: Enter the following transactions in the books of Blue Mount Cement Traders & post the voucher given below

   Blue Mount Cement Traders Balance sheet for the year ended 31-03-07

Liabilities	**Rs.**	**Assets**	**Rs.**
Capital	650000.00	Cash	184000.00
Sundry Creditors:-			
Allana & Sons	400000.00	**Deposites:-**	
Annapurna Traders	78000.00	Building Adv	80000.00
Giri Traders	16000.00	KST Deposits	9000.00
Krishnagiri Traders	27000.00	Telephone Deposits	4000.00
		Fixed Assets:-	
		Building	152000.00
		Godown	170000.00
		Sundry Debtors:-	
		Anil Agencies	22000.00
		Mahesh	30000.00
		Balaji Enterprises	25000.00
		Arjun Cement Links	182000.00
		Closing Stock	313000.00
	1171000.00		**1171000.00**

Voucher Entries:

01-04-07	Inv No.256 for Rs. 14000.00 cement purchased from Allana & Sons.
01-06-07	Cash received from Anil Agencies
01-07-07	Credit Bill 001 steel sold to Balaji Enterprises Rs. 38000.00
02-07-07	Cash deposited to ICICI Bank current a/c Rs. 120000.00
01-08-07	Canara Bank Chq no; 9213 received from Balaji Enterprises of Rs. 25000.00
01-09-07	Rs. 6000.00 transferred from current a/c as interest chq no; 56445
01-02-07	Paid telephone charges Rs. 4255.00
31-03-06	Depreciate building by 20%.

Problem 6: Enter the following transactions in the books of Suman Biscuits Agencies & post the voucher given below.

Suman Biscuits Agencies Balance Sheet for the year ended 31-03-2005

Liabilities	Rs.	Assets	Rs.
Capital	781723.42	Cash	223020.76
Sundry Crs:-			
Kwality Biscuits	3600000.00	**Deposites:-**	
Nutrine Confectionery	58865.00	Kwality Biscuits SD	90000.00
Madhu Kumar	14400.00	KST Deposits	2000.00
Building Adv	24000.00	Nutrine Confectionary SD	128204.00
SBI Bons OCC	120521.00	Telephone Deposits	2000.00
		Fixed Assets:-	
		Building	124500.00
		Godown	120521.00
		Sundry Debtors:-	
		Janardhan	18000.00
		Kiran Agencies	15000.00
		Krishna Murthy	12000.00
		Praveen Kumar	19000.00
		Premnath	15000.00
		SK Traders	172829.00
		Closing Stock	3657434.66
	4599509.42		**4599509.42**

Voucher Entries:

01-04-07	Inv No. 511 for Rs. 12800.00 biscuits purchased from Kwality Biscuits Ltd.
01-06-07	Cash received from Kiran Agencies Rs. 15000.00
01-07-07	Rreight charges Rs. 325.00 Vide VRL
02-07-07	Cash deposited to ICICI Bank current a/c Rs. 120000.00
01-08-07	Canara Bank Chq no; 9213 received from Balaji Enterprises of Rs. 25000.00
01-09-07	Rs. 6000.00 transferred from current a/c as interest chq no; 56445
01-02-07	Paid telephone charges Rs. 4255.00
31-03-06	Depreciate building by 20%.

PART B - WEB DESIGNING

1. Create a form having number of elements (text boxes,radio buttons,check boxes and so on). Write javascript code to count the number of elemnts in a form.
2. Create a student resume using HTML tags
3. Design a timetable using rowspan and colspan attributes
4. Create two webpages, first page consisting of student details and second page consisting of educational information. Link both the pages(Use image, ordered and unordered lists)
5. Create web page to demonstrate frames
6. Write a javascript to check whether the textboxes in a form has been left blank,popup an alert indicating which text box has been left empty.
7. Develop a html form which accepts any mathematical expression using javascript and displays the result.
8. Write a javascript code block using arrays and generate the current date in words, this should include the day,month and year.
9. Create a form to accept student information and write javascript code to declare the result.
10. Write javascript code which converts the text entered in a text box into uppercase.
11. Create a webpage which switches between the two images as the mouse pointer moves over the images.
12. Design a web page for restaurant transaction.

3BCA1: KANNADA/OTHER LANGUAGE-III

As per the syllabus recommended for the III Semester of Course B.B.M.

3BCA2: ENGLISH III

UNIT –I   **20Marks**

Voice (5 Marks)
Direct and Indirect Speech (5 Marks)
Verbs: Linking Verbs; Auxiliaries
        Transitive and Intransitive Verbs
        Negative Verbs and Infinitives (10 Marks)

UNIT-II   **20 Marks**

Reading and Writing Skills:
Reading aloud passages from Books, Newpapers, Journals etc.,
Precise Writing (10 Marks)
Paraphrasing (5 Marks)
Expansion (5 Marks)

UNIT-III   **20 Marks**

Facing Interviews (Including preparation necessary)
Interviewing skills
Group Discussion (4 Marks)

Conversation Skills in specific situations: (8x2=16)
Fixing an appointment
   a) At a Bank; Post-office
   b) At an Airport, Bus Stand, Railway Station
   c) At a Travel Agency, At the Hospital
   d) At the Doctor's

(Dialogue writing on a conversation between two persons from the above mentioned situations)

UNIT-IV
   a) Descriptive writing (Incidents, Events, People, Places, Objects. Etc.,)   10 Marks
   b) Essay Writing (Topics related to Computer Science)   10 Marks

Internal Assessment 20 Marks

   1. Based on attendance, class room performance and home assignments. (Students to maintain work-files of class and home assignments)   (10 Marks)
   2. Practicals based on Reading Skills.
      Group discussion etc.,   (10 Marks)

3BCA3 - Computer Architecture and Microprocessor

UNIT-1   **14 Hours**

Basic Structures of Computers: Computer types; Functional Units – Input unit, Memory unit, Arithmetic and logic unit, Output unit, Control Unit; Basic operational concepts; Bus structures; Multiprocessor and Multicomputer.

Storage Representation: Storage representation of characters; Memory locations and addresses – Byte addressability; Memory operation.

Addressing modes: Direct, Indirect, Immediate, Relative, Indexed.

Instruction formats: Zero address, one address, One-and-half address, Two address, Three address.

Instruction types: Data transfer, Arithmetic, Branching, Logical, Rotate, Stack operations, Input/Output and Machine control instructions.

Input/output Organization: Accessing Input/output devices; Interrupts; Direct Memory Access (DMA)- Block diagram of DMA Controller, cycle stealing, Burst mode.

Buses – Synchronous bus, Asynchronous bus; Interface circuits – Parallel port, Serial port.

Unit – 2   **14 Hours**

Memory System: Basic concept; Random Access Memories – Static RAM, Asynchronous DRAMs, Synchronous DRAMs; Read Only Memories – PROM, EPROM, EEPROM, Flash memory; Cache Memory; Virtual memories; Secondary storage – Magnetic hard disks, Optical disks.

Introduction to Microprocessor, assembly language, 8085 Microprocessor architecture, Pin diagram, introduction to 8085 instruction set, assembly language programming.

Unit – 3   **14 Hours**

Programming technology of 8085 with additional instructions, counters and time delays, stacks and subroutine, interfacing peripherals (I/Os) and applications. Interrupts, keyboard interfacing.

Introduction to 8086, advantages over 8085, additional features of 8086, modified addressing schemes.

Reference Books:

1. Computer organization by Carl Hamacher, Z.Varnesic and S.Zaky 5th Edition ,Mc Graw Hill,2002.
2. Microprocesor Architecture Programming and Application with 8085 by Ramesh. S. Gaonkar – Penram International Publishing (India) .
3. M.Morris Mano –Digital Logic and Computer design,PHI Pvt.Ltd., New Delhi
4. Baary B Brey- The Intel Microprocessor Systems:The 8086/8088 family architecture, programming and designing-PHI Publication.
5. John Uffenbeck, Micro Computers and Microprocessor, PHI.

3BCA4: Object Oriented Programming with C++

Unit 1   **14 Hours**

1. **Introduction**
    Procedure-oriented programming, Concepts of Object-oriented programming, benefits of OOP, Applications of OOP, Structure of C++ program.

2. **Fundamentals**
    Tokens, Keywords, Identifiers and constants, Basic Data Types, User-defined data types, Derived data Types, Symbolic constants, Type compatibility, Declaration of variables, Dynamic initialization of variables, Reference variables, Operators in C++, Scope resolution operator, Member dereferencing operators, Memory management operators, Manipulators, Type cast operator, Expressions and their types, Special assignment expressions, Implicit conversions, Operator overloading, Operator precedence, Control structures.

3. **Functions**
    The main function, Function prototyping, Call by Reference, Return by Reference, Inline functions, Default arguments, const arguments, Function overloading, Friend and Virtual functions.

Unit 2   **14 Hours**

4. **Classes and Objects**
    Specifying a Class, Defining member functions, Making an Outside function Inline, Nesting of member functions, Private member functions, Arrays within a Class, Static data members, Static member functions, Arrays of Objects, Objects as function arguments, friendly functions, Returning Objects, const member functions, Pointers to members.

5. **Constructors and Destructors**
    Constructors, Parameterized constructors, Multiple constructors in a class, Constructors with default arguments, Dynamic initialization of objects, Copy constructor, Dynamic constructor, Constructing Two-dimensional arrays, const Objects, Destructors.

6. **Operator Overloading and Type Conversions**
    Defining operator overloading, Overloading unary operators, Overloading Binary operators, Rules for overloading operators, Type conversions.

Unit 3   **14 Hours**

7. **Inheritance and Polymorphism**
    Introduction, defining derived classes, single inheritance, making a private member inheritable, multilevel inheritance, hierarchical inheritance, hybrid inheritance, virtual base classes, abstract classes, constructors in derived classes, polymorphism – introduction, pointers, pointers to objects, this pointers, pointers to derived classes, virtual functions, pure virtual functions.

8. **Console I/O Operations**
    C++ streams, C++ stream classes, Unformatted I/O operations, Formatted I/O operations, managing output with manipulators.

9. **Files:** Classes for file stream operations, opening and closing a file, detecting end of file, more about open(): file modes, file pointers and their manipulations, sequential input and output operations.

10. **Manipulating Strings**
    Introduction, creating objects, manipulating string objects, relational operations, string characteristics, accessing characteristics in strings, comparing and swapping.

Reference Books:

1. Object Oriented Programming with C++ , M.T. Somashekara, D.S. Guru, H.S. Nagendraswamy, K.S. Manjunatha, PHI Learning, New Delhi, 2012
2. Object Oriented Programming with C++ by E. Balagurusamy

3BCA5 - SOFTWARE ENGINEERING

UNIT - 1   **14 Hours**

1. Introduction to Software engineering , Software Products and characteristics, software engineering applications, Software engineering ethics.
   Software Process - Software engineering models: Waterfall Model, Prototyping, Spiral Model, RAD Model.

2. **Requirement Engineering:** Functional and Non-functional requirements,   User requirements, System requirements, the software requirements document; Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

UNIT – 2   **14 Hours**

3. **System Analysis Models:** Context models, Data models, Flow oriented Modeling – DFDs, Behavioral models – Use cases**.**

4. **Software Design:** Design process, Design characteristics, Design concepts,
   Design Models - Architectural design - Software Approach, Data Design, Architectural Styles and Patterns, Architectural design.
   Object Oriented Design - Object and Object Classes, design process, Design evaluation.
   User Interface design - Interface Analysis, Interface Design Steps, and Design evaluation.

UNIT-3   **14 Hours**

5. **Verification and Validation:** Testing Strategies, Strategic issues, Test   Strategies for conventional software - Black-box and White-box testing, Validation testing-System testing, Art of Debugging.

6. **Software Management:** Project management – Activities, Planning, Project
Scheduling- Concepts and Principles,
Risk management – Software Risk, Risk identification, Risk projection, Risk refinement.
Software cost estimation– Estimation techniques - Decomposition Technique - software sizing,
Empirical   estimation model -COCOMO Model, Project duration and staffing.
Quality management – Software quality Assurance and standards, ISO 9000 quality standards,
Software measurements, Metrics for Software quality**.**

Reference Books:

1. Software Engineering, Ian Sommerville, 6th Edition,9th Edition, Pearson Education Ltd.,
2. Software Engineering – A practitioners approach, Roger. S. Pressman, Tata-McGraw Hill 6th Edition.

3BCA6: Database Management Systems

UNIT I   **14 Hours**
Introduction to Database System Concepts and Architecture
Databases and Database Users, Characteristics of the Database Approach, Actors on the Scene, Advantages of Using a DBMS
Data Models, Schemas and Instances, DBMS Architecture and Data Independence, Database Languages and Interfaces, The Database System Environment
Data Modeling Using the Entity-Relationship Model
Entity Types, Entity Sets, Attributes, and Keys, Relationship Types, Relationship Sets, Roles, and Structural Constraints, Weak Entity Types**,** ER Diagrams, Naming Conventions and Design Aspects

UNIT II   **14 Hours**
Transaction- Transaction Concepts, States, ACID properties, Concurrent executions, Serializability
Relational Data Model, Relational Constraints, and Relational Algebra
Relational Model Concepts, Relational Model Constraints and Relational Database Schemas, Basic Relational Algebra Operations, Additional Relational Operations, Examples of Queries in Relational Algebra.
Normalization- Functional Dependencies, Transitive and Multivalued dependency, First Normal form, Second Normal Form, Third Normal Form and Boyce Codd Normal Form

UNIT-III   **14 Hours**
Advantages of RDBMS- Codd's Rules.
SQL-The Relational Database Standard
Data Definition, SQL Data Types and Schemas, Constraints, Basic Queries in SQL, Insert, Delete, and Update Statements in SQL, Set Operations, Aggregate functions, Views (Virtual Tables) in SQL, Joins – Inner, Outer and Self, Additional Features of SQL,DCL-commit, Rollback, Save-point, Grant privileges.

Reference Books:

1. Fundamentals of Database Systems by Navathe and Elmasri –Pearson Education, Fifth Edition.

2. Database Systems Concepts, 3rd edition by Abraham Silberschatz, Henry Korth and S. Sudarshan McGraw Hill International Editions.

3. Introduction to Database systems by CJ Date, Published by Addison-Wesley.

4. Principles of database systems by Ullman, Computer Science press, 1984.

5. Introduction to database systems by Bipin C.Desai, Galgotia.

3BCA7: Microprocessor Lab and UNIX Lab

PART - A

1. Program to Copy the content of two registers into different memory locations.

2. Subtraction of two 8-bit numbers.

3. Swapping of two 8-bit data using Direct and Indirect mode.

4. Addition of two 8-bit numbers with carry.

5. Multiplication of two 8-bit numbers.

6. Division of two 8-bit numbers.

7. Program to find the largest of two 8-bit numbers.

8. Program to check whether given number is **even** or **odd** ,
   If it is even display FF else display 00.

9. Program to exchange the content of two register pairs (using XCHG) &
   store these numbers into different memory locations.

10. Program to find the Sum of N natural numbers (1+2+3+...n).

11. Program to generate Fibonacci series up to N.

12. Addition of two 16-bit numbers.

13. Subtraction of two 16-bit numbers.

14. Program to convert Hexadecimal number into BCD numbers.

15. Program to find Largest of N numbers.

16. Program to search an element in a list of N numbers.

17. Program to sort numbers in ascending order.

18. Program to find the square of given 8-bit number (01 to 09).

19. Program to check whether the given number is **palindrome** or **not**.
    If it is palindrome display FF, else display 00.

20. Program to count numbers from 0 to 99 with delay.

PART B

1. Write a shell script to exchange the contents of two variables.
2. Write a shell script, which accepts three subject marks scored by a student and declare the result.
3. Write a shell script to print integer numbers from 1 to 20.
4. Write a shell script to perform arithmetic operation on two number depending on +, -, * and /.
5. Write an interactive shell script to display a menu and perform the following task:
   i. Renaming a file   ii. Deleting a file
   iii. Copying a file   iv. Exit
6. Write a shell script which counts the number of lines in a file.
7. Write a shell script to accept three command line arguments and display each one of them.
8. Write a c program to
   a. Display the PID of parent and PID of child.
   b. Copy the contents of one file into the other using command line arguments.
9. Write a c program to write a simple editor which serves the following purposes:
   i.   Cursor movement in all directions.
   ii.   Insert a new line and a character.
   iii.   Deletion of line and a character.
10. Assume a file with following information

    FirstName   MiddleName   Age
    -------------   ---------------   -----

    Write a shell script
    i.   To Sort the first name in alphabetical order.
    ii.   Sort the age in terms of ascending order.
    iii.   Sort the age in terms of descending order.
    iv.   Sort the middle name in alphabetical order.

11. Write a Shell script to display
    i.   The version of the shell.
    ii.   The user information.
    iii. Login date and time.
    iv. List of processes running on the system.
    v.   User home directory

3BCA8: Object Oriented Programming Lab

List of Experiments/Programs

PART-A

1. Write a c++ program to calculate the average of three numbers.
2. Write a c++ program to find the biggest of three numbers.
3. Write a c++ program to find minimum and maximum of two numbers using fuctions.
4. Write a c++ program to check the given number is palindrome or not
5. Write a c++ program to sum of all even and odd numbers.
6. Write a c++ program to perform arithmetic operations using classes and objects.
7. Write a c++ program to define a student class with user name, to name, total, average for –n"
   students.
8. Write a c++ program to illustrate the use of static member function.
9. Write a c++ program to find the mean value using friend function..
10. Write a c++ program to show the use of copy constructor.
11. Write a c++ program to implement multiple inheritances.
12. Write a c++ program to illustrate pointers to objects.
13. Write a c++ program to read a string with get line function.
14. Write a c++ program to display string with write() function.
15. Write a c++ program to specify field size with using width function.

PART-B

16. Write a c++ program to accept two times (hh:mm:ss) to find subtraction of two times.
17. Write a c++ program to implement processing shopping list using a class with arrays as data
    members.
18. Write a c++ program to implement banking scheme.
19. Write a c++ program to show the use of over loaded constructor.
20. Write a c++ program to construct variables at run time using dynamic initialization.
21. Write a c++ program to find the largest value among the set of parameters using overloaded function.
22. Write a c++ program to add two complex number using operator overloading.
23. Write a c++ program to demonstrate single inheritance.
24. Write a c++ program to implement multilevel inheritance.
25. Write a c++ program to illustrate the implementation of virtual base class.
26. Write a c++ program to illustrate the use of array of pointer to objects.
27. Write a c++ program to implement reading and writing class objects using files.

IV SEMESTER

4BCA1: KANNADA/OTHER LANGUAGE-IV

As per the syllabus recommended for the IV Semester of Course B.B.M.

4BCA2: ENGLISH –IV

As per the syllabus recommended for the IV Semester of Course B.B.M./ B.com

4BCA3: DATA COMMUNICATION AND COMPUTER NETWORKS

Unit 1:   **14 Hours**

Data Communication, Component and Basic Concepts –
- Introduction
- Characteristics – Delivery, Accuracy, Timeliness and Jitter
- Components – Message, Sender, Receiver, Transmission medium and protocol

Topology – Mesh, Star, Tree, Bus, Ring and Hybrid Topologies
Transmission modes – Simplex, Half Duplex, Full Duplex
Categories of networks – LAN, MAN, WAN
Network Components – Signal Transmission – Analog Signaling, concept of ASK, FSK, PSK, Digital Signaling, concept of Unipolar, Polar, Return-to-Zero(RZ), Biphase, Manchester, Differential Manchester, Non-Return-to-Zero (NRZ), Bit Synchronization, Asynchronous Bit Synchronization and Synchronous Bit Synchronization, Baseband and Broadband Transmissions.
Guided Media – Twisted-Pair Cable, Coaxial Cable, Fiber-Optic Cable
Unguided Media – Radio Wave Transmission Systems, Microwave Transmission Systems, Infrared Transmission Systems and Satellite Communication System.

UNIT – II   **14 Hours**

The OSI Model – Functions of all the Seven Layers
Networking Devices – Functions and Applications of Hub, Switches, Bridges, Repeaters
Internetworking Devices – Functions and Applications of Routers and Gateways
IP Addressing – Dynamic IP Addressing, Static IP Addressing, Types of IP Addresses
Protocols –TCP, UDP, IP, IPV4, IPV6, TCP/IP Suite, SMTP, POP3, SNMP, HTTP, FTP, DNS, ICMP IGMP, ARP, RARP, OSPF, BGP, ALOHA

UNIT – III   **14 Hours**

Packet Switching Networks – Network Services and Internal Network Operations, Packet Network Topology, Datagrams and Virtual Circuits, Connectionless Packet Switching, Virtual Circuit Packet Switching.

Routing Concepts – Routing Tables, Dijkstra's Shortest Path Routing Algorithm, Flooding, Distance Vector Routing, Congestion Control Algorithms-Leaky Bucket Algorithm.

Data Link Issues –Single bit error and Burst Error, concepts of Redundancy, Checksum, Single Bit Error correction and Hamming Code correction method.

Reference Books:

1. Introduction to Data Communications and Networking by Behrouz Forouzan.
2. Computer Networks by Andrew S Tanenbaum.
3. Networking Essentials – Third Edition – Jeffrey S. Beasley, Piyasat Nilkaew

4BCA4: Computer Oriented Numerical Analysis and Statistical Methods

UNIT-1   **14 Hours**

Computer Arithmetic: Floating point representation of numbers, arithmetic operations with normalization, consequences of normalized floating point representation of numbers, Errors in numbers

Finding the roots of an equation: Iterative method: Introduction, Beginning an iterative method, Bisection method, Newton Raphson method, Regula Falsi method, Secant Method. Comparison of Iterative methods, Order of Convergence of Newton Raphson Method and Secant Method.

Ordinary differential equations: Euler's method, Taylor series method, Range Kutta II and IV order methods.

UNIT-2   **14 Hours**

Numerical Integration: Simpson's 1/3 and 3/8 rule, Trapezoidal rule.

Solving simultaneous linear equations: Introduction, Gauss Elimination method, pivoting, illconditioned equations, Gauss Jordon method, LU Decomposition method and Gauss-Seidel iterative method. Comparison of direct and iterative methods.

Interpolation: Introduction, Lagrange interpolation, Difference Tables- Newton-Gregory Forward and Backward interpolation, Truncation error in interpolation.

UNIT-3   **14 Hours**

Statistical methods: Introduction, definitions, classifications, frequency distribution, mean-arithmetic mean for grouped and ungrouped data, continuous frequency distribution(step deviation method), Geometric mean for grouped and ungrouped data.

Standard deviation -meaning standard deviation for actual mean method, assumed mean method and step deviation method using discrete series and continuous series.

Coefficient of variation – meaning and problems

Median – meaning, calculations of median for ungrouped, Discrete series, continuous series

Mode- meaning calculations of mode for discrete series and continuous series

Correlation – meaning, types, rank correlations and problems.

Note: Algorithmic approach for all statistical methods.

Reference Books:

1. Computer Oriented Numerical Methods by Rajaraman. V.
2. Fundamentals of Mathematical Statistics by Gupta and Kapoor (Sultan Chand).
3. Probability and Statistics for engineers and scientists by Ronald E. Walpole and Raymond H Mayers.
4. Mathematical Statistics by John Freund (Prentice Hall India Pvt. Ltd.)
5. Numerical Methods by Jain M.K., S.R.K. Iyengar and R.K. Jain

4BCA5: Data Warehousing and Data Mining

UNIT-I   **14 Hours**
Introduction: What is Data Warehouse? Data Warehouse Modeling: Data Cube and OLAP, Data Warehouse Implementation, Data Mining, What kinds of Data can be Mined, What kinds of patterns can be Mined, Data cleaning, Data integration: (Entity, Identification Problem, Redundancy & Correlation Analysis), Data Reduction: (Wavelet Transforms, Attribute Subset Selection, Histogram, Clustering, Sampling, Data Cube Aggregation),
          Data Transformation: Strategies Overview, Data Transformation by Normalization.

UNIT-II   **14 Hours**
Mining Frequent Patterns, Associations & Correlations: Basic Concept, Frequent Itemset mining methods, pattern evaluation methods.
Classification, Decision tree Induction, Attribute Selection Measures, Tree Pruning, Bayes Classification Methods.
UNIT-III   **14 Hours**
Cluster Analysis: What is a cluster analysis? Requirement for Cluster Analysis, Partitioning methods, Hierarchical methods.
Data Mining Applications & Trends: Mining Sequence Data; Time Series, Symbolic, Biological; Statistical Data Mining, Visual & Audio Data Mining, Data Mining Applications, Data Mining Trends.

Reference Books:
1. Jiawei Micheline Kamber, ‗Data Mining Concepts and Techniques‘, Morgan Kauf Mann Publishers.
2. George M. Marakas, ‗Modern Data Warehousing, Mining and Visualization‘, Pearson Education, 2003.
3. W.H. Inmon, ‗Building the Data Warehouse‘, Wiley dreamtech, 3rd Edition.
4. Mastering Data Mining – Michael J.A. Berry & Gordon S. Linoff (Wiley Pub.).
5. Data Warehousing (Pearson Ed.) – Sam Anahory & Dennis Murray.

4BCA6: Computer Graphics

UNIT-1   **14 Hours**

Introduction – applications of computer graphics, operations of computer graphics, graphics software packages.

Graphical input – output devices- graphical input devices, graphical output devices, raster scan video principles- raster scan monitors, color raster scan systems, plasma panel display, LCD panels, hard copy raster devices. Random scan devices- monitor tube displays, plotters.

Scan conversion – scan conversion methods, polynomial method for line, polynomial method for circle, DDA algorithm for line, circle and ellipse, Bresenham's algorithm for line drwing and circle. Midpoint methods for line and circle, problems of scan conversion.

UNIT-1   **14 Hours**

Scan conversion for solids- solid areas or polygons, inside-outside test – odd even method, winding number method. Solid area filling algorithms- boundary fill algorithm, scan line fill algorithm, scan line seed fill algorithm, ordered edge list algorithm.

2D geometrical transformations – basic transformations- translation, rotation, scaling, homogeneous co-ordinate system – transformations in homogeneous notation, inverse of basic transformations, scaling about a reference point, rotation about an arbitrary point. Other transformations – reflection about any arbitrary line, shearing, combined transformation- computational efficiency, visual reality, inverse of combines' transformations.

3D geometrical transformations- basic 3D transformation- 3D translation, 3D scaling. 3D rotation, rotation about an arbitrary axis in space, other 3D transformations- 3D reflection, reflection about any arbitrary plane, 3D shearing.

UNIT-1   **14 Hours**

Projection – introduction, parallel projection- orthographic projection, axonometric projection, oblique projection, perspective projection – standard perspective projection, vanishing points. Image formation inside a camera.

2D viewing and clipping- windows and viewports, viewing transformation, clipping of lines in 2D- cohen-sutherland clipping algorithm, midpoint subdivision method, polygon clipping – Sutherland – hogman polygon clipping.

Curve design – classical techniques for designing curves and object surfaces, modern curve representations.

Reference Book:
1. Computer Graphics, Multimedia and Animation by Malay K Pakhira
2. Computer Graphics, Donald Hearn, M. Pauline Baker, Prentice-Hall
3. Computer Graphics, Roy A. Plastock, Gordon Kalley, Schaum's Outlines, McGraw Hill

4BCA7: Numerical Analysis and Statistics Lab

PART-A

1. Program to solve the given equation x*x-14=0 by using Bisection method.

2. Program to solve the given equation x*x+5*x-6=0 by using Regula Falsi method.

3. Program to solve the given equation x*x*x*-12=0 by using Newton Raphson method.

4. Program to solve the given equation dy/dx=1+y*y where y(0)=1,h=0.1,find y(0.4) using Eulers method.

5. Program to solve the given equation dy/dx=x*y where y(1)=2,h=0.3,find y(1.4)by using Rungekutta's II order method.

6. Program to solve the given equation dy/dx= x*y where y(1)=2,h=0.3,find y(1.4) by using Rungekutta's IV order method.

7. Program to solve the given equation ∫ dx/(1+x) where, a=0,b=1,n=10 by using Trapezoidal method.

8. Program to solve the given equation ∫ sin x dx where a=0,b=π /2,n=6 by using Simpson's 1/3 rule.

9. Program to solve the given equation ∫ sin x dx where a=0,b=π /2,n=6 by using Simpson's 3/8 rule.

PART-B

10. Program to solve the following set of simultaneous equation x+y+4z=12, 8x-3y+2z=20,4x+11y-z=33 using the Guass Elimination method.

11. Program to solve the following set of simultaneous equation $2x_1+6x_2-x_3$ =-14,5x $_1$-x$_2$ +2x$_3$ =29,-3x$_1$ - 4x$_2$ +x$_3$ =4 using Guass Jordon method.

12. Program to solve the following set of simultaneous equation 2x$_1$ –x$_2$ +x $_3$ =5, x$_1$ +3x$_2$- 2x$_3$=7,x$_1$+2x$_2$+3x$_3$=10 using Guass Seidal method.

13. Program to compute mean, median, mode and standard deviation of n elements using linear array for ungrouped data.

14. Program to calculate correlation co-efficient for ungrouped data.

15. Program to generate frequency distribution table.

4BCA8: Visual Programming and DBMS Lab

PART A

1. Write a VB program to find addition, subtraction, multiplication and division using _Option Button'.
2. Consider two _List Boxes', where items are displayed in list1 and selected items of list1 are transferred to list2.
3. Using _Select Case' change the background color of the form depending upon the value entered by the user.
4. Write a program to find the Numbers of Characters, Words and Vowels by using string functions.
5. Write a VB program to concatenate two strings.
6. Create the user interface to create _Student Details' such as Name of student, Subject, Marks obtained for the subject, depending on the marks obtained for that subject, declare the Results as
   >= 75 Distinction
   >=60 && <75, First Class
   >=45 && <60, Second Class
   >=35 && <45, Pass
   <35, Student Fails.
7. Create _MDI Forms' to accept order, purchase and sale of products (by using Menu Editor).
8. Write a VB program to find Factorial of a given number using Recursive functions.
9. Write a VB program to Swap two numbers using functions.
10. Create user interface and events to select a particular file from a directory in a drive using _Rich Text box'.
11. Create an application in text file and display its record in a textbox by using a sequential method.
12. Write a program to achieve color palette.
13. To draw circle, line and text using picture box.
14. Project - Online super market.
15. Project - Hotel management

PART B

Activity 1:
Database : Student (DDL, DML statements)
Table: Student

Name	Regno	Class	Major
Smith	17	1	CS
Brown	8	2	CS

Table: Course

CourseName	CourseNumber	CreditHours	Department
Intro to computer science	CS1310	4	CS
Data Structure	CS3320	4	CS
Discrete Mathematics	MATH2410	3	MATH
Database	CS3380	3	CS

Table: Section

SectionIndentifier	CourseNumber	Year	Instructor
85	MATH2410	98	King
92	CS1310	98	Andreson
102	CS3320	99	Knuth
112	MATH2410	99	Chang
119	CS1310	99	Andreson
135	CS3380	99	Stone

Table: Grade_report

Regno	Section_identifier	Grade
17	112	B
17	119	C
8	85	A
8	92	A
8	102	B
8	135	A

- **Create Tables using create statement**
- **Insert rows to individual tables using insert statement**
- **Alter table section add new field section and update the records**
- **Delete brown's grade report**
- **Drop the table section**

Activity 2: (Select clause, Arithmetic Operators)
Database: employee
Create Following **tables** and insert **tuples** with suitable constraints

EMPLOYEE

EMPID	FIRSTANAME	LASTNAME	Hire_Date	ADDRESS	CITY
1001	George	Smith	11-May-06	83 first street	Paris
1002	Mary	Jones	25-Feb-08	842 Vine Ave	Losantiville
1012	Sam	Tones	12-Sep-05	33 Elm St.	Paris
1015	Peter	Thompson	19-Dec-06	11 Red Road	Paris
1016	Sarath	Sharma	22-Aug-07	440 MG Road	New Delhi
1020	Monika	Gupta	07-Jun-08	9 Bandra	Mumbai

EMPSALARY

EMPID	SALARY	BENEFITS	DESIGNATION
1001	10000	3000	Manager
1002	8000	1200	Salesman
1012	20000	5000	Director
1015	6500	1300	Clerk
1016	6000	1000	Clerk
1020	8000	1200	Salesman

Write queries for the following
1. To display FIRSTNAME, LASTNAME, ADDRESS AND CITY of all employees living in PARIS.
2. To display the content of employee table in descending order of FIRSTNAME
3. Select FIRSTNAME and SALARY of salesman
4. To display the FIRSTNAME,LASTNAME, AND TOTAL SALARY of all employees from the table EMPLOYEE and EMPSALARY. Where TOTAL SALARY is calculated as SALARY+BENEFITS
5. List the Names of employees, who are more than 1 year old in the organization
6. Count number of distinct DESINGATION from EMPSALARY
7. List the employees whose names have exactly 6 characters
8. Add new column PHONE_NO to EMPLOYEE and update the records
9. List employee names, who have joined before 15-Jun-08 and after 16-Jun-07
10. Generate Salary slip with Name, Salary, Benefits, HRA-50%, DA-30%, PF-12%, Calculate gross. Order the result in descending order of the gross.

Activity 3: (Logical, Relational Operators)

Database: Library
Create Following **tables** and insert **tuples** with suitable constraints

Table: Books

Book_Id	Book_name	Author_Name	Publishers	Price	Type	Quantity
C0001	The Klone and I	Lata Kappor	EPP	355	Novel	5
F0001	The Tears	William Hopkins	First Publ	650	Fiction	20
T0001	My First C++	Brain & Brooke	ERP	350	Text	10
T0002	C++ Brainworks	A.W.Rossaine	TDH	350	Text	15
F0002	Thunderbolts	Ana Roberts	First Publ.	750	Fiction	50

Table : Issued

Book_Id	Quantity_Issued
T0001	4
C0001	5
F0001	2
T0002	5
F0002	8

Write queries for the following
1. To show Book name, Author name and price of books of **First Publ**. publisher
2. Display Book id, Book name and publisher of books having quantity more than 8 and price less than 500
3. Select Book id, book name, author name of books which is published by other than ERP publishers and price between 300 to 700
4. Generate a Bill with Book_id, Book_name, Publisher, Price, Quantity, 4% of VAT ―Total‖
5. Display book details with book id‘s C0001, F0001, T0002, F0002 (Hint: use IN operator)
6. Display Book list other than, type Novel and Fiction
7. Display book details with author name starts with letter ‗A‘
8. Display book details with author name starts with letter ‗T‘ and ends with ‗S‘
9. Select BookId, BookName, Author Name , Quantity Issued where Books.BooksId = Issued.BookId
10. List the book_name, Author_name, Price. In ascending order of Book_name and then on descending order of price

Activity 4: (Date Functions)
Database : Lab
Create Following **table** and insert **tuples** with suitable constraints

Table : Equipment_Details

No	ItemName	Costperitem	Quantity	Dateofpurchase	Warranty	Operational
1	Computer	30000	9	21/5/07	2	7
2	Printer	5000	3	21/5/06	4	2
3	Scanner	8000	1	29/8/08	3	1
4	Camera	7000	2	13/6/05	1	2
5	UPS	15000	5	21/5/08	1	4
6	Hub	8000	1	31/10/08	2	1
7	Plotter	25000	2	11/1/09	2	2

(Use date functions and aggregate functions)

1. To select the ItemName purchase after 31/10/07
2. Extend the warrenty of each item by 6 months
3. Display Itemname , Dateof purchase and number of months between purchase date and present date
4. To list the ItemName in ascending order of the date of purchase where quantity is more than 3.
5. To count the number, average of costperitem of items purchased before 1/1/08
6. To display the minimum warranty , maximum warrenty period
7. To Display the day of the date , month , year of purchase in characters
8. To round of the warranty period to month and year format.
9. To display the next Sunday from the date '07-JUN-96'
10. To list the ItemNaName, which are within the warranty period till present date

Activity 5: (Numeric, character functions)
Use Functions for the following

1. Find the mod of 165,16
2. Find Square Root of 5000
3. Truncate the value 128.3285 to 2 and -1 decimal places
4. Round the value 92.7683 to 2 and -1 decimal places
5. Convert the string _Department' to uppercase and lowercase
6. Display your address convert the first character of each word to uppercase and rest are in lowercase
7. Combine your first name and last name under the title Full name
8. A) Take a string length maximum of 15 display your name to the left. The remaining space should be filled with _*'
9. Take a string length maximum of 20 display your name to the right. The remaining space should be filled with _#'
10. Find the length of the string _JSS College, Mysore'
11. Display substring _BASE' from _DATABASE'
12. Display the position of the first occurrence of character _o' in Position and Length
13. Replace string Database with Datatype
14. Display the ASCII value of __(Space)
15. Display the Character equivalent of 42

Activity : 6 (set operators)
Database : subject
Create Following **table** and insert **tuples** with suitable constraints
Table - Physics

Regno	Name	Year	Combination
AJ00325	Ashwin	First	PCM
AJ00225	Swaroop	Second	PMCs
AJ00385	Sarika	Third	PME
AJ00388	Hamsa	First	PMCs

Table – Computer Science

Regno	Name	Year	Combination
AJ00225	Swaroop	Second	PMCs
AJ00296	Tajas	Second	BCA
AJ00112	Geetha	First	BCA
AJ00388	Hamsa	First	PMCs

1. Select all students from physics and Computer Science
2. Select student common in physics and Computer Science
3. Display all student details those are studying in second year

4. Display student those who are studying both physics and computer science in second year
5. Display the students studying only physics
6. Display the students studying only Computer Science
7. select all student having PMCs combination
8. select all student having BCA combination
9. select all student studying in Third year
10. Rename table Computer Science to CS

Activity 7: (views)
Database: Railway Reservation System
Create Following **table** and insert **tuples** with suitable constraints

Table: Train Details

Train_no	Train_name	Start_place	Destination
RJD16	Rajdhani Express	Bangalore	Mumbai
UDE04	Udhyan Express	Chennai	Hyderabad
KKE55	Karnataka Express	Bangalore	Chennai
CSE3	Shivaji Express	Coimbatore	Bangalore
JNS8	Janashatabdi	Bangalore	Salem

Table : Availability

Train_no	Class	Start_Place	Destination	No_of_seats
RJD16	Sleeper Class	Banglore	Mumbai	15
UDE04	First Class	Chennai	Hyderabad	22
KKE55	First Class AC	Bangalore	Chennai	15
CSE3	Second Class	Coimbatore	Bangalore	8
JNS8	Sleeper Class	Bangalore	Salem	18

1. Create view **sleeper** to display train no, start place, destination which have sleeper class and perform the following
   a. insert new record
   b. update destination='Manglore' where train no='RJD16'
   c. delete a record which have train no='KKE55'
2. Create view **details** to display train no, train name, class
3. Create view **total_seats** to display train number, start place, use count function to no of seats , group by start place and perform the following
   a. insert new record
   b. update start place='Hubli' where train no='JNS8'
   c. delete last row of the view
4. Rename view sleeper to class
5. Delete view details

Activity 8 (group by, having clause)
Database: Bank system
Create Following **table** and insert **tuples** with suitable constraints

Table: Account

Account_no	Cust_Name	Brach_ID
AE0012856	Reena	SB002
AE1185698	Akhil	SB001
AE1203996	Daniel	SB004
AE1225889	Roy	SB002
AE8532166	Sowparnika	SB003
AE8552266	Anil	SB003
AE1003996	Saathwik	SB004
AE1100996	Swarna	SB002

Table: Branch

Branch_ID	Branch_Name	Branch_City
SB001	Malleshwaram	Bangalore
SB002	MG Road	Bangalroe
SB003	MG Road	Mysore
SB004	Jainagar	Mysore

Table: Depositor

Account_no	Branch_Id	Balance
AE0012856	SB002	12000
AE1203996	SB004	58900
AE8532166	SB003	40000
AE1225889	SB002	150000

Table: Loan

Account_no	Branch_Id	Balance
AE1185698	SB001	102000
AE8552266	SB003	40000
AE1003996	SB004	15000
AE1100996	SB002	100000

1. Display Total Number of accounts present in each branch
2. Display Total Loan amount in each branch
3. Display Total deposited amount in each branch by descending order
4. Display max , min loan amount present in each city.
5. Display average amount deposited in each branch , each city
6. Display maximum of loan amount in each branch where balance is more than 25000
7. Display Total Number of accounts present in each city
8. Display all customer details in ascending order of brachid
9. Update Balance to 26000 where accno=AE1003996
10. Display Customer Names with there branch Name

Activity 9: (Nested Query)
Database : Book Dealer Table : Author

Author_id	A_Name	City	Country
EE10258	Sudaker Samuel	Bangalore	India
PE96358	Natarasu	Kolkata	India
LT45879	Tenenbaum	Toranto	Canada
PW56325	Sumitabha Das	Kolkata	India
KA56983	Galvin	Loss Angles	USA

Table : Publisher

Publisher_ID	Name	City	Country
21	TMH	Delhi	India
22	PHI	Kolkata	India
23	PEARSON	Mumbai	India
24	EEE	Singapore	Singapore
25	LPE	Banglore	India

Table : Category

Cateogry_ID	Description
31	CSE
32	ISE
33	E&E
34	E&C

Table : Catalog

Book_id	Title	Author_ID	Publisher_ID	Category_ID	Year	Price
41	OS	PW56325	23	31	1998	275
42	CN	LT45879	22	32	2000	475
43	EC	EE10258	23	34	2002	380
44	SE	LT45879	24	32	2002	480
45	DBMS	PW56325	21	31	1999	650
46	EC	PE96358	25	33	2004	250

Table : Order Details

Order_no	Book_id	Qunatity
51	41	15
52	45	50
53	42	20
54	44	10
55	43	35
56	46	25

1. List the other publications located where PEARSON publication is located
2. List the book with maximum price
3. Display book details having quantity=25

4. Display the author details those who are publishing with PHI publisher
5. Display the Books details published for ‗CSE' category
6. Display the author details those who publish in Indian publications
7. Display book details those who have orders less than 20
8. Display all the books published under ‗CSE' & ‗ISE' category
9. Delete book details of order_no=56
10. Alter table order details add new column order_date & update the columns

Activity 10:
Database: Mobile Shoppe (Using Joins)
Create Following **table** and insert **tuples** with suitable constraints
 Table: Mobile Handsets

Custno	Cname	Model	Handsetno	Amount
1010	Sita	Nokia	RM560	9500
1020	Ritesh	Samsung	SR12365	3200
1030	Reena	Nokia	RM236	1200
1040	Karan	Sony Ericsson	SE12334	8200
1050	Anu	LG	LT1255	2000

Table: Connection Details

Custno	Cname	Connection	ActivationDate	Validity	Amount	Phoneno
1010	Seetha	Airtel	11-May-09	365	650	9985632551
1020	Ritesh	Vodafone	10-Sep-08	180	400	9923033652
1030	Reena	Tata Docomo	12-Aug-09	100	150	9036225636
1040	Karan	Airtel	12-Jan-09	90	200	9896325415
1060	Anoop	Reliance	12-Sep-09	365	220	9342653326

1. Display Customer Name, Handset Model, connection, Validity of the connection
2. Display All Mobile Handsets along with Connection and Activation date
3. Display all Connection Details along with handset model and Handset purchase date
4. Display The Handset Details which is having highest amount than Samsung handset
5. Display Customer Name, Handset Model, connection, Validity which is having validity of one year
6. Display Customer number, customer name, connection and activation date of connections activated between 01-Jan-08 to 30-Dec-09
7. Display Customer number, Model, Connection which is having ‗Airtel' Connection
8. Display Customer number, Model, Connection which is having model is Nokia and connection is Airtel
9. Select Customer number, customer name and model which is having price more than model Samsung
10. Perform Cartesian join on Mobile Handsets and Connection details table

5BCA1: Constitution of India

42 hours

I. Meaning of the term ―Constitution"-Its importance-making of the Indian Constitution 1946-49-Dr.Ambedkar's contribution-Preamble-Method of amending the constitution and its limitation-An over view of constitutional developments.

II. The democratic institutions created by the Constitution-bicameral system of legislature and cabinet form of government at the Center and States-Role and Position of President and Prime Minister-Adult Franchise System-Election Commission, Panchayat Raj System.

III. Fundamental Rights and Duties- Their content and significance-Special, rights created in the constitution for Dalits, Backwards, Women, Children and the Religious and Linguistic Minorities.

IV. Enforcing rights through writs: Certiorari, Mandamus,Quo Warranto and Habeas Corpus-public interest Litigation-Directive Principles of State Policy-The need to balance Fundamental Rights with Directive Principles-Constitution and sustainable development.

V. Doctrine of Separation of Powers-Legislative, Executive and Judicial and their composition and functioning in India-Features of Indian Federalism-Center State relations. Measures for national Unit-Public Service Commissions.

References Books:

1. J.C. Johari, The constitution of India- A Politico-Legal Study-Sterling Publications, Pvt.Ltd.New Delhi.
2. J.N.Pandey:Constitutional Law of India, Allahabad, Central Law Agency, 2002.
3. Granville Austin:The Indian Constitution-Corner Stone of a Nation-Oxford, NewDelhi.2000.

5BCA2: Environmental Studies

42 hours

I. The Multidisciplinary nature of Environmental Resources.
 Definition, Scope and Importance, Need for Public awareness.
II. Natural Resources and associated problems.
 a)Forest Resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining dames and their effects on forests and tribal people.
 b) Water Resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
 c) Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
d) Food Resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case study.
e) Energy Resources: Growing energy needs, renewable and non-renewable energy resources use of alternate energy sources. Case studies.
f) Land Resources: land as a resource, land degradation, man induced landslides, soil erosion and desertification.
III. Ecosystems: concept, structure and function, producers, consumers, decomposers, Energy flow , Ecological succession, Food chains, food webs and ecological pyramids.
 Introduction, types , characteristics, structure and function of following ecosystems:
a) Forest Ecosystem
b)Grassland Ecosystem
c)Desert Ecosystem
d) Aquatic Ecosystems(pond, streams, lakes,,rivers,oceans,estuaries)
IV. Biodiversity and its conservation: Introduction, Definition:genetic, species and ecosystem diversity, Biogeographical classification of India, value of Biodiversity, Biodiversity at Global, National and local levels. India as a mega-diversity nation. Hot-spots of biodiversity. Threat to biodiversity, Endangered and endemic species of India. Conservation of bio-diversity.
V. Environmental Pollution: Definition, causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards.
VI. Social Issues and the Environment: From Unsustainable to sustainable development, Urban problems related to energy, Water conservation, rain water harvesting , watershed management, Resettlement and rehabitilization of people; its problems and concerns. Case studies.
Environmental ethics:Issues and possible solutions.
Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocause, case studies. Wasteland reclamation, Consumerism and waste products, Environment protection Act, Air(prevention and control of pollution) Act, Water (Prevention and control of pollution)Act, Wildlife protection Act, Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness.
VII. Human population and Environment: Population growth, variation among nations. Population explosion-Family Welfare Programme.Environment and human health. Human Rights. Value Education.HIV/AIDS, Women and Child Welfare, Role of Information Technology in Environment and human health. Case studies.
VIII. Field work: visit to a local area to document environmental assets-river/forest/grassland/hill/mountain.
Visit to locate polluted site, study of common plants, insects, birds, study of simple ecosystems.

References:
1. Agarwal, K.C.2001 Environmental Biology, Nidi publications Ltd.Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt.Ltd.,Ahmedabad-380013
3. Brunner R.c>,1989,Hazardous Waste Incineration,k McGraw Hill Inc.480 p.
4. Trivedi R.K. and P.K.Goel, Introduction to Air pollution. Techno-science publications.
5. Wagner K.D.1998. Environmental Management, W.B.Saunders Co.Philadelphia, USA.

5BCA3 - JAVA

UNIT-1   **14 Hours**

Fundamentals of Object-Oriented Programming.
Introduction to Java : Origin and features of Java. Java Program Structure, Java Tokens, Java statements, Java Virtual machine, Command Line Parameters, Java Variables and Data Types, Operators, Decision Making, Branching and looping statements.
Classes, Objects and Methods used in Java: Class fundamentals, Methods, Constructors, Overloading, Inheritance, Interfaces, One and two dimensional arrays, Vectors, Strings, Wrapper Classes.

UNIT-2   **14 Hours**

Java Packages: API packages, system packages, naming conventions, creating and accessing a package, adding a class to a package, hiding classes.
Multi-threads Programming: Java thread Model, Main Thread, creating a Thread, Creating Multiple Threads, Extending the thread class, Stopping and blocking a thread, Life cycle of a thread, Managing Errors and Exceptions.
Applet Programming: Introduction, how applet differ from application, Applet life cycle, Applet tag, passing parameters to applet. Abstract Windows Toolkit: Components, Container, Panel, Label, Button, Checkbox, CheckboxGroup, Choice, List, TextField, TextArea, Scrollbars.

UNIT-3   **14 Hours**

Graphics Programming: The Graphics class, Lines and Rectangles, Circles and Ellipses, Drawing Arcs, Drawing Polygons, Line Graphs, Using Control Loops in Applets.
Managing Input/output Files in Java: Stream Classes, Byte Stream Classes, Character Stream Classes, Creation of Files, Reading/Writing characters, Reading/Writing Bytes, Handling Primitive Data Types, Concatenating and Buffering Files, Random Access Files.
Networking: InetAddress, TCP/IP Client Sockets, TCP/IP Server Sockets, URL, URLConnection.
JDBC Objects: JDBC Driver Types, Loading the JDBC Driver, Connect to the DBMS, Create and Execute a Sql Statement, Process Data Returned by the DBMS, Database Connection, Statement Objects.

Reference Books:
1. Programming with Java – A PRIMER by E.Balagurusamy, Tata McGraw-Hill 3rd Edition
2. The Complete Reference - Java-2 by Patrick Naughton and Herbert Schildt Published by Tata McGraw-Hill India.
3. The Complete Reference – J2EE by Jim Keogh, published by Tata McGraw-Hill.

5BCA4 - OPERATION RESEARCH

Unit I: **14 Hours**

Definition of the term Operation Research – Nature , Management Application , Modeling , Principles of modeling , features , Different Phases , scope , Advantages and Limitations of O.R. General method for solving O.R models and Role o O.R in decision making.   Some important definitions – solutions to LPP, feasible solution, basic solutions, Basic feasible solution, Optimum basic feasible solution, unbounded solution. Assumptions in LPP, Limitations of LPP, Applications of LPP and advantages of LPP.
Standard Linear Programming – Formulation of a Linear Programming Solving L.P.P. by Graphical Method Problem. And Simplex Method.

Unit II: **14 Hours**

Artificial Variable Technique – two phase method and Big M method,
Duality – Meaning, definitions of primal problem , General rules for converting any primal problem into its dual . Characteristics of Dual problem, Advantages of Duality, Dual formulation procedure and Problems to obtain the dual of LPP. Fundamental Duality theorems, Primal and Dual correspondence.

Unit III: **14 Hours**

Transportation Problems – Method of finding initial basic feasible solution to Transportation problem-North West Corner, Least Cost Method and Vogel's Method.
Method of finding initial basic feasible solution to Assignment Problem using Hungarian Method.
Sequencing Problems – Definitions, terminology and notations, Principle assumptions, Processing _n' jobs through two machines
Travelling Salesman (Routing) Problems **-** Formulation**s** of TSP as an assignment problem

Reference Books:

1. ―Operation Research", by S.D.Sharma Kedarnath Ramnath Publishers 16th edition 2010.

5BCA5: MULTIMEDIA [ELECTIVE I]

UNIT-I **14Hours**

Multimedia Communication: Introduction, Multimedia information representation. Multimedia Networks, Multimedia applications, Network QoS and application QoS.
Information Representation: text, image, audio and video, text and image compression, compression principles, text compression, image compression. Audio and Video compression, Video compression Principles, Lossless Compression Algorithm, Lossy Compression Algorithm, video compression standards- H.261. H.263.PI.323, MPEG 1, MPEG 2, other coding formats for text, speech, image and video.

UNIT-II **14Hours**

MPEG 4: coding of audiovisual objects, MPEG 4 systems, MPEG 4 audio and video, profile and levels, MPEG 7 standardization process of multimedia content description, MPEG 21 multimedia framework, Significant features of JPEG 2000, MPEG 4 transport across the internet
Synchronization: Notion of synchronization, presentation requirements, reference model for synchronization
Overview of Multimedia File Formats-GIF, JPEG, PNG, TIFF, EXIF, PS, PDF, WMF, BMP,

UNIT-III **14Hours**

Overview of Multimedia Editing Tools-Adobe, Macromedia Director, Macromedia Flash, Dreamweaver, Resource management and process management techniques.
Multimedia Communication across Networks: Layered video coding, error relevant video coding techniques, multimedia transport across IP networks and relevant products such as RSVP, RTP, RTCP, DVMRP, multimedia in mobile networks, multimedia broadcast networks, and content based retrieval in digital libraries.

References Book:

1. Ze-Nian Li & Mark S. Drew, "Fundamentals of Multimedia", Pearson Education

2. J.R. Ohm. "Multimedia Communication Technology", Springer International Edition, 2005.

3. K.Sayood. "Introduction to Data Compressiojn", 2nd Ed, Morgan Kauffman. Indian Edition, 2000.

4. V.Bhaskaran and K. Konstantinedes. "Image and Video Compression Standards. Algorithms and Architecture." 2nd Ed, Kluwer publication, 1997.

5. Fred Halsall, "Multimedia communication", Pearson Education, 2001.6. K.R. Rao, Zoram S. Bojkovic, Dragorad A. Milovanovic, "Multimedia Communication System", Pearson Education, 2004.

5BCA5: COMPUTER SYSTEM SECURITY [ELECTIVE I]

UNIT – I   14Hours

Security polces, Standards & Guideline
Different Types of polces standards & guidelines
Common Elements
Policy Standards & Guide development
Policy Creation
Regulatory Considerations

Security Attacks, Services & Mechanisms
Attacks Services & Mechanisms
Security Attacks
Security Services
A model for internet work security

UNIT-2   14Hours

Conventional Encryption
Conventional Encryption Techniques
Steganography
Classical Encryption techniques

Intruders, Viruses & Worms
Intruders
Viruses & Related Threats

UNIT-3   14Hours

Firewalls
Hardware Firewalls
Software Firewalls,
Advantages and Disadvantages of Firewalls
Hardware Firewalls Design Principles
Trusted Systems
Applications of Software Firewalls
Applications of Hardware Firewalls

References Books

1. Security Architecture Design, Deployment & Operations by Cistopher M king, Curtis E.
   Dalton, T.Ertem Osmanoglu

2. Cryptography & Network Security Principles & Practice (Second Edition)

5BCA5: C# [ELECTIVE I]

UNIT-1   **14 Hrs**

Introduction: Overview of OOP, Introduction to C # - Characteristics, application, Difference between c and c#, The .NET strategy, the origins of the .NET technology, the .NET framework, benefits of the .NET approach, C# and .NET, c# program structure, command line argument, maths function, Literals, variables and data , constant variables, scope of variables, boxing and unboxing, Operators in C#, expression, Decision making and looping statements in c#

Methods in C# : declaring methods, nesting of methods, methods parameters, the output parameters, variable arguments list, method overloading, Arrays - variable size arrays, the system, array class, array list class, String handling

UNIT-2   **14 Hrs**

Inheritance and polymorphism : classical inheritance, containment inheritance, defining a subclass, visibility control, defining subclass constructors, multilevel inheritance, hierarchical inheritance, overriding methods, hiding methods, abstract classes, abstract methods, sealed classes : Preventing inheritance, sealed methods, polymorphism.

Interfaces : Multiple Inheritance : defining an interface, extending an interface, implementing interface, interface & inheritance, explicit interface implementation, abstract class and interface. **Operator overloading :** overloadable operators, need for operator overloading, defining Operator overloading, overloading unary operators, overloading binary operators, overloading Comparison operators.

UNIT-3

Delegates and Events : Delegate, delegate declaration, delegate methods, delegates instantiation, delegate invocation, using delegates, multicast delegates, events. **Managing Console I/O operations** : console class, console input, console output, formatted output, numeric formatting, standard numeric format, custom numeric format.

Managing Errors and Exceptions : Types of errors, exceptions, syntax of exception handling code, multiple catch statement, the exception hierarchy, general catch handler, using final statement, nested try blocks, throwing our own exceptions, checked and unchecked operators, using exceptions for debugging.

Reference Books

1. Profession c# - By Karli Watson, Simon Robinson, Christian Nagel, Wiley India Pvt Ltd, 3rd Edition
2. C# Unleashed – By Joseph Mayo, Techmedia, First Edition
3. Programming C# - By Jesse Liberty, Shroff Publishers, 4TH Edition
4. Programming In C# - By *Barbara Doyle,* Cengage \ Delmar Learning India Pvt, First Edition

5BCA6: DIGITAL IMAGE PROCESSING [ELECTIVE II]

UNIT – I   **14 Hours**

Introduction – Image Processing, Applications, Stages, Architecture of Image Processing System, Sampling and Quantization, Pixel Neighborhood and Connectivity, Distance Measures.

UNIT –II   **14 Hours**

Image Enhancement – Enhancement in the Spatial Domain, Transformation Functions, Histogram Processing – Equalization, Matching, Local Histogram Processing, Spatial Domain Filters – Smoothing and Sharpening Filters, Enhancement in the Frequency Domain - Fourier Transforms, One-D and Two-D discrete Fourier Transforms, Lowpass and Highpass Frequency Domain Filters – Ideal, Butterworth and Gaussian, Fast Fourier Transforms

UNIT-III   **14 Hours**

Image Restoration – Image Degradation and Restoration Model, Noise Properties, Noise Probability Density Junction, Noise Reduction using Spatial and Frequency Domain Filtering, Color Image Processing – Color Models, Pseudo Color Image Processing
Image Morphology – Fundamentals, Erosion and Dilation, Opening and Closing, Hit–or-Miss Transformation, Basic Morphological Algorithms
Image Segmentation – Point, Line and Edge detection, Image thresholding, Region Based Segmentation – Region Growing, Merging and Splitting
Representation – Chain Code, Polygon Approximation, Boundary Descriptors – Shape Number, Regional Descriptor

Reference Book:

1. Digital Image Processing, Rafael C Gonzalez, Richard E Woods, Pearson
2. Digital Image Processing – Anil K Jain
3. Image analysis and Pattern recognition by Earl Gose, Richard Johnsonbaugh, Steve Jost, PHI

5BCA6: COMPUTER ANIMATION [ELECTIVE II]

UNIT-1: **14 hours**

What is animation, why we need animation, history, uses of animation, types of animation, principles of animation, techniques of animation, animation on the web-3d animation-special effects, creating animation, Creating animation in Flash: Introduction to flash animation-introduction to Flash-working with the timeline and frame based animation-working with the timeline and tween based animation-understanding layers-action script

Unit-II **14 Hours**

3D Animation and its concepts-types of 3d animation-skeleton and kinetic 3d animation-texture and lighting of 3d animation-3d camera tracking-application and software of 3d animation
Motion caption-formats-methods-usages-expression-motion capture software's-script animation usage-different language of script animation among the software

UNIT-III **14** Hours

Concept development-story developing-audio and video-color model –device independent color model-gamma and gamma correction-production budgets-3D animated movies

Reference books
1. Principles of Multimedia-Ranjan Parekh, 2007, TMH
2. Multimedia Technologies-Ashok Banerji, Ananda Mohan Ghosh, McGraw Hill publication

5BCA6: SYSTEM SOFTWARE [ELECTIVE II]

UNIT I   **14 hours**

Introduction
Review of programming languages, System software and machine architecture – Hypothetical Machine architecture - Data and instruction formats - addressing modes - instruction sets
Assemblers
Elements of assembly language, Basic assembler functions - Assembler algorithm and data structures - One pass and two pass assemblers – Detailed flowchart.

UNIT-2   **14 Hours**
Loader and Linker
Basic loader functions – Types of loader-Compile and go, General loading scheme, Design of an Absolute Loader, Relocation , Program Linking , Self relocating programs, Linkage Editors, Linking for Overlays

UNIT-3
MACRO PROCESSORS and Editor   **14 Hours**
Basic macro processor functions - Macro Definition and Expansion – Macro Processor Algorithm and data structures - Machine-independent macro processor features , Conditional Macro Expansion – Keyword Macro Parameters-Macro within Macro-Implementation example
Text editors - Overview of the Editing Process - User Interface – Editor Structure. - Interactive debugging systems

REFERENCES

1. D. M. Dhamdhere, ―Systems Programming and Operating Systems", Second Revised Edition, Tata McGraw-Hill, 1999.
2. John J. Donovan ―Systems Programming", Tata McGraw-Hill Edition, 1972.
3. Leland L. Beck, ―System Software – An Introduction to Systems Programming", 3rd Edition, Pearson Education Asia, 2000.

5BCA7 – Java Programming Lab

PART-A
1. Write a Java program to demonstrate method overloading.
2. Write a Java program to sort a list of numbers.
3. Write a Java program to demonstrate manipulation of strings.
4. Write a Java program to demonstrate single inheritance.
5. write a Java program to sort the names using vectors.
6. Write a Java program to demonstrate Arrayindexoutofbounds and arithmetic
Exceptions.
7. Write a Java program to demonstrate Multiple Threading.
8. Write an applet to display the sum of two digits.
9. Write a Java program to display the IP address of your working machine.
10. Write a Java program to demonstrate free hand writing.
PART-B
1. Write a Java program to draw line, rectangle, circle ,oval and polygon with the help of java graphic class.
2. Write a Java applet to demonstrate Animation using threads.
3 . Write a Java program to demonstrate Access Control using packages.
4. Write a Java program to display the result of a student using multiple inheritance.
5. Write a Java program to demonstrate simple calculator with the help of text fields, buttons.
6. Write a Java program using I-O streams to count the number of words in a file.
7. Write a Java program to copy characters from one file into another.
8. Write a Java program to demonstrate Client Server Interaction.
9. Write a Java applet to calculate Area and Circumference of a circle using radio button and checkbox.
10. Write a simple database and connect it using JDBC.

5BCA8 – Operation Research and .NET Lab

PART A

1. Program to solve Linear Programming Problem using Simplex method
2. Program to solve transportation problem using North West Corner method
3. Program to solve transportation problem using Least Cost Method
4. Program to solve transportation problem using Vogel's Approximation Method
5. Program to solve Assignment problem using Hungarian method
6. Program to solve Travelling Salesman Problem.

PART B

ASP.NET LAB CYCLE

1) Write a program to display three images in a line. When any one of the images is clicked, it must be displayed below. On clicking the displayed image it must be cleared. The screen must look as in the figure given below:
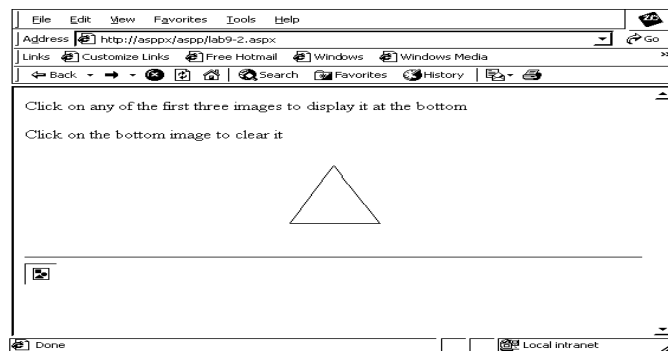
2) Write a program that displays a button in green color and it should change into yellow when the mouse moves over it.

3) Write a program to display the following feedback form.

The different options for the list box must be ASP-XML, DotNET, JavaPro and Unix,C,C++. When the Submit Form button is clicked after entering the data, a message as seen in the last line of the above figure must be displayed.

4) Write a program containing the following controls:
• A ListBox
• A Button
• An Image
• A Label

The listbox is used to list items available in a store. When the user clicks on an item in the listbox, its image is displayed in the image control. When the user clicks the button, the cost of the selected item is displayed in the control.

5) Write a program that binds the properties **ID**, **Name**, **Price** and **Qty** of a page to the following values:
ID: 10
Name: Wheat
Price: 14.25
Qty: 1000

6) Create a RadioButtonList that displays the names of some flowers in two columns. Bind a label to the RadioButtonList so that when the user selects an option from the list and clicks on a button, the label displays the flower selected by the user.

7) Create a user control that contains a list of colors. Add a button to the Web Form which when clicked changes the color of the Form to the color selected from the list.

8) Create a user control that receives the user name and password from the user and validates them. If the user name is ―University" and the password is ―BCA COURSE" then the user is authorized, otherwise not.

9) Create a component that receives two numbers from the user through a Web Form, and based on the user's selection it adds or subtracts the two numbers and returns the result to the Web Form. The result should be displayed in the Web Form.

10) Create a component that contains an array of 100 integers and a corresponding indexer. From a Web page, assign values to some of its elements. Then the Web Form should display the first 10 elements of the indexer.