KUVEMPU UNIVERSITY

Revised syllabus for BCA Course

And

BSc Computer Science Course

W.E.F 2016-17

DEPARTMENT OF STUDIES AND RESEARCH IN COMPUTER SCIENCE JANNASHAYADRI CAMPUS, SHAKARGHATTA

KARNATAKA,INDIA

KUVEMPU UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE
Syllabi of UG Courses in BCA and B.Sc (Computer Science)
For 2016-2017 New Batch

U. G. Board of Studies (BOS) in Computer Science

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<center>**Regulations for BCA course under semester scheme**</center>
<center>**(With effect from 2016-17)**</center>

Eligibility for Admission

1. A candidate who passed the three year Diploma in the branch of computer science, examination conducted by the board of Technical education, Government of Karnataka, shall be eligible for admission to first semester of BCA degree course.

2. A candidate who passed the two-year Pre-University examination in science/commerce of Karnataka state or any other examination considered as equivalent there to is eligible for admission to the first semester of BCA degree course.

3. If he/she is unable to pass or complete the degree within 6 years he/she should take readmission into BCA for I semester (study all the 6 semesters from first).

II) Claim of Exemption
A candidate who keeps terms for I, II and V semesters be allowed to keep terms for II, IV and VI semesters respectively, subjected to the following conditions:

1. A candidate who passes 50% of theory and practical's put together of I and II semester examinations (at the end of second semester) be allowed to keep terms for III semester.

2. A candidate who passes fully I and II semesters and 50% of theory and practical's put together of III and IV semesters examinations (at the end of IV semester) be allowed to keep terms for V semester.

BCA Regulations
For BSc course only students completing PUC or its equivalent examination with science subjects are eligible. For BCA course only students completing PUC or its equivalent examination with science subjects and PUC (Commerce) or its equivalent examination with Mathematics as one of the subjects are eligible.

R.1

a) Title of the course: Bachelor of Computer Applications (BCA)

b) Duration of the Course: The course shall be of three years duration spread over six semesters

c) Scheme of the Study:

i)   There shall be six theory papers and one practical each carrying 100 marks (80+20) for first semester and second semester

ii)   There shall be five theory papers, two practical papers each carrying 100 marks (80+20) from third to fifth semester

iii)   The project work shall be carried out either independently or jointly (minimum 3 students and maximum 5 students in a batch)

iv)   Medium of Instruction: The medium of instruction shall be English

d) Scheme of Examination:

i) At the end of each semester there shall be university examination of three hours duration in each of the theory paper/practical carrying 80 marks

ii) Internal assessment (IA) carrying 20 Marks in each of the theory Paper /practical shall be based on the performance of the student in two tests of one hour duration. No minimum for passing is required in IA

iii) At the end of the sixth semester each student shall able to submit the completed project report for the evaluation which shall be certified by internal guide and duly signed by the HOD and the principal. The project report and Viva-voce shall be evaluated by both Internal and External examiners.

R.2 Each semester shall be of 4 months duration

R.3 Attendance

Each student must have at least 75% attendance in each of the course (theory and Practical) in each semester. Shortage of attendance will be dealt with as per university rule from time to time.

R.4 Carry over system

A candidate is allowed to carry over maximum of 60% uncleared (failed) papers and/Practical's of previous semester to subsequent semesters from the first to sixth semester to subsequent semester from the first to sixth semester

R.5 The maximum period for completion of the course shall be six years from the date of admission

R. 6 Eligibility for admission:

a) Any student who has passed PUC-II in science or commerce subject secured a minimum of 35% of marks.

<div align="center">OR</div>

b) Any student who has passed JOC(job Oriented Course) in Computer Technique/computer Applications/Electronics/Electrical branch with minimum of 35% of marks in aggregate in all the semesters/years.

<div align="center">OR</div>

c) Any student who has passed diploma in engineering (Three years duration of course Regulated by and affiliated to AICTE) in computer science/Computer applications/Electronics/Electrical branch with minimum of 35% of marks in aggregate in all the semesters/years

<div align="center">OR</div>

d) Any student who has passed Industrial training Institutes(ITI) (Regulated by and affiliated to AICTE) in Computer Science/Computer applications/Electronics/Electrical branch with minimum of 35% of marks in aggregate in all the semesters

R.7 Admission Procedure

a)Merit list shall be prepared based on marks obtained in eligible course.

b)Reservation: as per the notification/Govt.orders from the university/Govt from time to time.

R.8 Results:

a) Minimum for pass in each of theory paper/practical (computer lab)/Project report shall be 35% at the university semester examination.

b) The aggregate minimum for pass in each of the theory/Practical (computer lab)/Project work shall be 40% of marks in each course including IA/Viva-volcano minimum marks is required in IA/Viva-Voce

NEW SYLLABUS FOR BCA (EFFECT FROM 2016-17)

Semester	First	Weekly hours	Internal marks	External marks	total
Paper code	Subject				
BCA01/02/03/04	KAN/SANS/URDU/HINDI-I	4	20	80	100
BCA05	ENGLISH-I	4	20	80	100
BCA13	MATHEMATICS-I FOR COMPUTER APPLICATION	4	20	80	100
BCA14	COMPUTER FUNDAMENTALS	4	20	80	100
BCA15	C -PROGRAMMING	4	20	80	100
BCA18	DIGITAL FUNDAMENTALS	4	20	80	100
BCA17	C PROGRAMMING LAB	3	20	80	100
Total		27			700

Semester	second	Weekly hours	Internal marks	External marks	total
Paper code	Subject				
BCA01/02/03/04	KAN/SANS/URDU/HINDI-II	4	20	80	100
BCA05	ENGLISH-II	4	20	80	100
BCA23	MATHEMATICS-II FOR COMPUTER APPLICATION	4	20	80	100
BCA24	COA	4	20	80	100
BCA25	STATISTICS AND PROBABILITY	4	20	80	100
BCA26	DATA STRUCTURE USING C	3	20	80	100
BCA27	DATA STRUCTURE LAB	3	20	80	100
Total		27			700

Semester	THIRD	Weekly hours	Internal marks	External marks	total
Paper code	SUBJECT				
BCA01/02/03/04	KAN/SANS/URDU/HINDI-III	4	20	80	100
BCA05	ENGLISH-III	4	20	80	100
BCA33	OBJECT ORIENTED PROGRAMMING WITH C++	4	20	80	100
BCA34	SYSTEM SOFTWARE	4	20	80	100
BCA35	DATA BASE MANAGEMENT SYSTEM	4	20	80	100
BCA36	C++ LAB	3	20	80	100
BCA37	SQL LAB	3	20	80	100
TOTAL		26			700

Semester	FOURTH	Weekly hours	Internal marks	External marks	total
Paper code	SUBJECT				
BCA01/02/03/04	KAN/SANS/URDU/HINDI-IV	4	20	80	100
BCA05	ENGLISH-II	4	20	80	100
BCA43	JAVA PROGRAMMING	4	20	80	100
BCA44	COMPUTER GRAPHICS AND MULTIMEDIA	4	20	80	100
BCA45	DATAWAREHOUSING AND DATA MINIG	4	20	80	100
BCA46	JAVA LAB	3	20	80	100
BCA47	CG LAB	3	20	80	100
TOTAL		26			700

Semester	FIFTH	Weekly hours	Internal marks	External marks	total
Paper code	SUBJECT				
BCA51	ADVANCED JAVA PROGRAMMING	4	20	80	100
BCA52	DATA COMMUNICATION	4	20	80	100
BCA53	WEB TECHNOLOGY WITH PHP	4	20	80	100
BCA54	OPERATING SYSTEM	4	20	80	100
BCA55*	SOFTWARE ENGINEERING	4	20	80	100
BCA56	WEB TECHNOLOGY LAB	3	20	80	100
BCA57	ADVANCED JAVA LAB	3	20	80	100
TOTAL		26			700

Semester	SIXTH	Weekly hours	Internal marks	External marks	total
Paper code	SUBJECT				
BCA61	COMPUTER NETWORKS	4	20	80	100
BCA62	DOT NET WITH C#	4	20	80	100
BCA63	UNIX AND SHELL PROGRAMMING	4	20	80	100
BCA64	UNIX AND SHELL PROGRAMMING LAB	3	20	80	100
BCA65	PROJECT LAB	3	20	80	100
TOTAL		18			500

NEW SYLLABUS FOR B.Sc. (Computer Science)

(EFFECT FROM 2016-17)

Paper code	Semester	SUBJECT	Weekly hours	Internal marks	External marks	PRACTICALS	total
BSC1	I	CF &CP	4+3	10	50	40	100
BSC2	II	DS	4+3	10	50	40	100
BSC3	III	DBMS	4+3	10	50	40	100
BSC4	IV	C++	4+3	10	50	40	100
BSC5	V	JAVA	4+3	10	50	40	100
		OS&UNIX	4+3	10	50	40	100
BSC6	VI	ADV JAVA	4+3	10	50	40	100
		SE&CN	4+3	10	50	40	100
TOTAL							800

BCA-13 : MATHEMATICS –I FOR COMPUTER APPLICATIONS

Number of Teaching hours – 48

Theory Examination- 80 Max marks.
Internal Assessment- 20 Max marks

Unit-1   SETS, RELATIONS AND FUNCTIONS   10hrs

Definition of a set,sub-set with examples,Venn digrams,types of sets-equal sets,null set,disjoint sets,finite set,infinite set,power set,cardinality of set.Operations on sets-union and intersection of two sets,complement of a set,difference of two sets,symmetric difference of sets.Algebraic properties of set operations,addition principle for two finite sets and for three disjoint sets.Computer representation of sets and subsets,strings and regular expressions. Definition of a relation with examples,types of relations-empty,universal,trivial,equivalence, reflexive, symmetric,transitive relation(definition and examples only,no problems).Definition of a function with examples,types of function,one-to-one(injective),Binay operation-commutative,associative,identity,invertible(definition   and   examples   only,no problems).Functions for computer science-characterstic function,floor function,ceiling function.

Unit-2   LOGIC AND REASONING   10 hrs

Definition of proposition or statement, proposition variables, negation of statements,truth table,   conjunction,disjunction,implications quantifiers- predicate,universal quantifier, universal   quantification,existential   quantification.Conditional   statement/implication, contrapositive and converse,equivalence or biconditional, tautology, contradiction,logical equivalence,   properties   of   proposition   operation-commutative,associative,distributive,idempotent negation. Simple problems on tautology and equivalence. Rules for validting statements

Unit-3   MATHEMATICAL INDUCTION AND COUNTING   10hrs

Principle of mathematical induction,simple problems on principle of mathematical induction.Fundmental principle of counting(statement with examples only),permutations-definition and simple problems.combinations- definition and simple problems.pigenhole principle- statement and proof, extended pigenhole principle- statement and proof.

Unit-4   MATRICES   10 hrs

Definition of matrix and order of matrix,types of matrices-coumn matrix,row matrix,squre matrix,diagonal matrix,scalar matrix,identity matrix,zero matrix(definition and examples only,no problems),equality of matrices(definition and examples), simple problems on equality of matrices.operations on matrices-addition, subtraction, product of two matrices,scalar multiplication of a matrix,inverse of a matrix, simple problems on these operations.

Unit-5   DETEMINANTS   **08 hrs**

Definition of determinant(definition and examples), determinant of matrix of order one , order two and order three(simple problems),properties of determinant(examples only, no verification),applications of determinants and matrices for solving the system of linear equations of two variables and three variables(simple problems),applications of determinant and matrices for checking the system of linear equations for consistency and inconsistency(simple problems).

Refence Books:
1.Text book of Mathematics – Shanthi Narayan
2.Text book of Mathematics – S. Lipschutz

PART -I   05 Marks
There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART- II 75 Marks
There shall be 07 questions carrying equal 15 Marks.
Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions

Question Paper must contain:
Question 1 from Unit 1.
Question 2 from Unit 2
Question 3 from Unit 2
Question 4 from Unit 3
Question 5 from Unit 4
Question 6 from Unit 4
Question 7 from Unit 5

BCA 14 COMPUTER FUNDMENTALS

Number of teaching hours – 48

Theory Examination- 80 Max marks.
Internal Assessment- 20 Max marks

Unit 1- Introduction to Computer Systems   10hrs
Definition of a Computer, History of Computers, Generations of Computers, Block diagram of a Computer with functional units (explanation), Parts of a computer system with peripherals (explanation of peripherals), and essential computer hardware , Information processing Cycle.

Unit 2- Input and output device   05hrs
Input devices-key board mouse, track ball, light pen, joy stick(explanation with diagram and working),outputdevices,monitors types of monitors printing and types of printers and working with advantages and disadvantages. Representation of data, text code-EBCDIC, ASCII, EXTENDED, ASCII, UNICODE. Memory: Tracks and sectors, cache memory Primary memory: RAM and its types,ROM and its types Secondary memory : hard disk,CD-ROM,DVD

Unit 3. Software: 08 hrs
Definition of software, types of software's application and system software with example , assembler, compiler, interpreter, linker, loader (Definitions only).Classification of languages high level and low level language(assembly and machine level) advantage and disadvantages.Operating System Basics : Definition, functions of an operating system, types of operating system, graphical user interface - basic components of GUI.MS DOS COMMANDS with syntax and example : copycon,type,copy,rename,del,make directory,remove directory,dir and its types,copy files from one drive to other drive,tree,hiding files)

Unit 4- Problem Solving Techniques :   10 hrs
Problem Definition, Problem Analysis, Design of Problems and Design Tools. ALGORITHMS: Algorithm-definition, Characteristics, Notations,   Advantages   and   Disadvantages. FLOWCHART: Definition, Symbols, Advantages and Disadvantages. Debugging, Testing, Documentation and Maintenance. Writing an algorithm and flowchart : Area of circle, arithmetical operations, simple interest and compound interest, quadratic equation, largest of three numbers, sum of N natural numbers, factorial of number, Fibonacci series, prime number,reverse a given number.

Unit 5- Computer Networks -basic concepts   05 hrs
Definition,uses of network,types of network,network topology,network transmission media(twisted pair,co axial,optical fiber), definitions of network terface card(NIC),Hub,Bridge,Switch,Router,Bandwidth),internet and its applications,understanding world wide web(how the web works,web browsers)
References:
1. Computer fundamentals- RAJARAMANNA
2.   Computer fundamentals- P B KOTTUR

<div align="center">**QUESTION PAPER PATTERN**</div>

PART -I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART- II 75 Marks

There shall be 07 questions carrying equal 15 Marks.
Each question must contain sub-questions-(a), (b), (c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions

Question Paper must contain:
Question 1 from Unit 1
Question 2 from Unit 2
Question 3 from Unit 2
Question 4 from Unit 3
Question 5 from Unit 4
Question 6 from Unit 4
Question 7 from Unit 5

BCA 15:   C Programming

Number of Teaching Hours – 48
Theory Examination- 80 Max marks.   **Internal Assessment- 20 Max marks.**

Unit 1- Introduction   **8hrs**
History of c-programming, Features, basic program structure, character set, tokens, keywords
and identifiers. Constants, variables, data types, variable declaration, symbolic constant
definition.

Unit 2 –Operators   **10hrs**
Arithmetic, relational, logical, assignment, increment and decrement, conditional, bitwise and
special operators, Arithmetic expressions, precedence of operators and associatively. Type
conversions, mathematical functions. Managing I/O operations –   reading and writing a
character, formatted and unformatted I/O. Review of algorithm and flow chart

Unit 3- Decision making, branching and looping   **10hrs**
If and if-else statement, nested if, else if ladder, switch statement, ? operator, go to statement,
while, do-while and for, nested for, infinity for loop, examples, break and continue
statements.

Unit 4- Arrays and Functions   **10hrs**
One and two dimensional arrays, array initialization. Strings - declaration and initialization of
string variable, reading and writing strings, string handling functions. Functions – Need,
syntax of function declaration, all types of functions, nesting of functions, categories,
parameter passing mechanism, function with arrays, Recursion .

Unit 5-Structures And Pointers: Pointers- concept, pointer operator and operation
                                                                                                                             10hrs
Pointer arithmetic, dynamic memory allocation, command line arguments. Structure
Definition, declaration, accessing structure members, structure with in structure, example
programs, structure with array, union and difference between structure and union with
example programs,typedef,enum

Reference :

1. Computer Concepts and Programming, *Padma Reddy*
2. Let us C , Yashwanth Kanetkar
3. Ansi C, *Balagurusamy*

QUESTION PAPER PATTERN

PART- I   05 Marks
There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART- II 75 Marks There shall be 07 questions carrying equal 15 Marks.
Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions

Question Paper must contain:
 Question 1 from Unit 1.
 Question 2 from Unit 2
 Question 3 from Unit 3
 Question 4 from Unit 3
 Question 5 from Unit 4
 Question 6 from Unit 4
 Question 7 from Unit 5

BCA-16 DIGITAL FUNDAMENTALS

Number of Teaching Hours – 48
Theory Examination- 80 Max marks.   **Internal Assessment- 20 Max marks.**

Unit 1- Number system and codes: **04 Hrs**
Binary number system, decimal number system, octal number system, hexadecimal number system. Bases inter conversions. Representation of negative numbers 1's and 2's complements. Codes:. BCD, GRAY, EXCESS-3.

Unit 2- Boolean algebra and logic systems: **10 Hrs**
Laws of Boolean algebra, Boolean laws. Evaluation of Boolean expression, De Morgan's theorems and proof, simplification on Boolean expressions using Boolean laws Basic gates (AND, OR, NOT): truth table, Definition, Boolean expression and symbols, universal gates (NAND, NOR): truth table, definition, Boolean expression and symbols, design of basic gates using NAND and NOR gates. Logical gates using NAND and NOR, Design of given Boolean expression using basic gates or NAND gate or NOR gate. XOR and XNOR gate (Definition, Boolean expression and symbols, truth table).

Unit 3- Simplification of Boolean functions: **12 Hrs**
SOP and POS form, min term and max term, expression of Boolean equation in Min and Max term(conversion of SOP and POS forms to standard form) **K-map method: Rules,** simplification of Boolean equation using K-map (up to 4 variables), without and with don't-care condition, Implementation using basic gates or NAND gate or NOR gate, Quine - Mc Cluskey Tabulation method ,determination and selection of prime implicates.

Unit 4- Combination logic: **08Hrs**
Design procedure, design of half adder and full adder, half subtract or and full sub tractor. Code converters:- BCD to Excess 3 code, gray code, magnitude comparator, encoders (BCD to decimal), decoder (decimal to BCD), multiplexer(4:1 and 8:1), de-multiplexer(1:4 and 1:8).

Unit 5- Sequential logic: **14 Hrs**
Introduction, Flip-flops – SR,JK, D, T, JK-MS (Detailed Study) Registers – Introduction, shift register- types and applications. Counters – synchronous and asynchronous counters (Up, down, up down and Mod counters, ring counter, Johnson counter) with timing diagram.

References:
1. Digital Logic and Computer Design- M. Morris Mono
2. Digital fundamentals – B.Basavaraj

QUESTION PAPER PATTERN

PART- I   05 Marks
There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART -II 75 Marks There shall be 07 questions carrying equal 15 Marks.
Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions

Question Paper must contain:
 Question 1 from Unit 1.
 Question 2 from Unit 2
 Question 3 from Unit 3
 Question 4 from Unit 3
 Question 5 from Unit 4
 Question 6 from Unit 5
 Question 7 from Unit 5

BCA 17   C- programming lab

PART - A

1. All roots of quadratic equation
2. First biggest and second biggest among n numbers
3. Prime numbers between M and N (M<=N)
4. Fibonacci series between M and N
5. Binary to Octal conversion
6. Sorting an unsorted array'
7. Deleting the repeated elements in an array

PART - B
8. Any four String handling function using switch-case
9. Addition of two matrices
10. Multiplication of two matrices
11. Comparison of [A] and $[A]^T$
12. Sum of upper triangular, lower triangular and diagonal elements of a square matrix.
13. Binary and linear search in an array using function
14. Norm and trace of a matrix

PRACTICAL EXAM SCHEME

Practical Proper - 60 Marks
Viva – voce   - 10 Marks
Record -   10 Marks

C-Program	Flowchart/Algorithm	10 Marks
	2 Program Writing	30 Marks
	Error free Compilation or Partial output	10 Marks
	Correct output with proper display	10 Marks

BCA 23   MATHEMATICS –II FOR COMPUTER APPLICATIONS

Number of Teaching hours – 48

Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks.

Unit 1 - Groups theory   08 hrs

Definition of group, sub group, integral powers of element of a group, order of an element, properties related to order of an element of a group, cyclic groups, properties of cyclic group, coset decomposition of a group with examples

Unit 2 - Introduction to Graph theory   10 hrs

Definition of graph, graph as models, matrices and isomorphism, graph terminologies-definitions, properties and examples, Decomposition and special graphs. Paths, cycles and trails -connection in graphs, bipartite graphs, Eulerian circuits. Vertex degree and counting-counting extremal problems and graphic sequences and bijections paths, cycles and trails-connection in graphs

Unit 3 – Directed Graphs   10 hrs

Definition of directed graph, properties and examples, vertex degrees, Eulerian digraphs, orientations and tournaments. Trees and distance-basic properties, properties of trees, distance in trees and graphs, disjoint spanning trees, spanning trees and enumeration of trees, Hamilton paths and circuits, Representation and Isomorphism, colouring graphs. Decomposition of graphs, special graphs. Optimization and trees-minimum spanning tree, shortest paths, trees in computer science.

Unit 4 – Introduction to operations research   10 hrs

Nature and definition of OR, meaning, models characteristics, advantages. General methods for solving O.R..models - analytical, numeric and Monte Carlo. Advantages and scope.   10hrs

Unit 5 – Linear programming problem, transportation, assignment   10 hrs

Linear Programming Problems: Formulation (both minimization and maximization type) solution of LPP using graphical method. General LPP. Basic solutions and degenerate solutions. Standard form and canonical form. Characteristic features of LPP. Transportation problem(NWC,LC,VAM),Assignment problem, Travelling salesman Problem

Reference Books:

    1. Introduction to Graph theory by S. Lipschutz
    2. Operations research by S. D. Sharma
    3. Operation Research by Kalavathi.
    4. Discrete Mathematical Structures by Bernard Kolman

QUESTION PAPER PATTERN

PART -I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART- II 75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions
Question Paper must contain:
Question 1 from Unit 1
Question 2 from Unit 2
Question 3 from Unit 3
Question 4 from Unit 3
Question 5 from Unit 4
Question 6 from Unit 5
Question 7 from Unit 5

BCA 24   COMPUTER ORGANISATION AND ARCHITECTURE

Number of Teaching hours – 48
Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks.

Unit 1- Basic Structure of Computers   **10hrs**
Basic operational concepts, Bus Structures, performance, Multiprocessors and Multicomputer, Historical perspective.

Unit 2- Machine instructions and programs   **10 hrs**
Numbers, Arithmetic Operation and Characters, Memory Location and Addresses, Memory Operations, Instruction and Instruction Sequencing, Addressing Modes, Assembly Language, Basic Input/output Operation, Stacks and Queues, Subroutines, Additional Instructions.

Unit 3- Input/ output organization   **10 hrs**
Accessing I/O Devices, Interrupts, Direct Memory Access, Buses, Interface Circuits, Standard I/O interfaces

Unit 4- The memory system   **10 hrs**
Basic Concepts, Semiconductor RAM memories, Cache memories, Virtual Memories.

Unit 5- Basic processing unit   **10 hrs**
 Some fundamental concepts , execution of complete instruction, multiple-bus organization , introduction on hardwired control and Micro programmed control, distinguish between hardware control and micro control

References:

1. Computer organization : Carl Hamacher, Zvonko Vranesic and Safwat Zaky McGraw

2. Digital Logic and computer design : Morris Mano, M.

4. Computer Architecture and Organisation : Tanenbaum, A.S.

5. Computer Architecture and Organisation : Hayes, J.P

QUESTION PAPER PATTERN

PART- I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.

The student has to attend all the 05 questions.

PART- II 75 Marks

There shall be 07 questions carrying equal 15 Marks.

Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.

The student has to attend any 05 full questions

Question Paper must contain:

Question 1 from Unit 1

Question 2 from Unit 2

Question 3 from Unit 2

Question 4 from Unit 3

Question 5 from Unit 4

Question 6 from Unit 5

Question 7 from Unit 5

BCA 25 STATISTICS AND PROBABILITY

Number of teaching hours – 48

Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks.

Unit 1- Introduction to statistics   10 hrs

Definition of statistics, scope of statistics, characteristics of statistics, functions and limitations of statistics. Basic concepts(definitions only)-units/ individuals, populations/universe, sample, variable, attribute, discrete variable, continuous variable, qualitative data and quantitative data. Stages of Statistical method – collection, organisation/classification, presentation, analysis and interpretation of data (in brief).Classification of data-definition, objectives, types of classification. Definitions of frequency, class frequency, frequency distribution ,discrete frequency distribution, continuous frequency distribution, class-inclusive class and exclusive class, class limits, correction factor, open-end frequency distribution, mid-point or class mark, width/size of class number of classes, cumulative frequency, frequency density. Rules/Guidelines for classification. Tabulation-definition, objectives, types of tables-one way/simple, two way and manifold tables(dominions only).

Unit 2 -Analysis of Univariate data   10 hrs

Definitions-central tendency, average, arithmetic mean, mode, median, geometric mean and harmonic mean. Simple problems on arithmetic mean ,geometric mean and harmonic mean. Measures of Dispersion- range, range coefficient, mean deviation, mean deviation coefficient and standard deviation, standard deviation coefficient (definitions only). simple problems on mean deviation, mean deviation coefficient and standard deviation, standard deviation coefficient.

Unit 3 -Analysis of Bivariate data   10 hrs
Correlation-definition, types of correlation (i)based on number of variables-simple, multiple and partial correlation, (ii) based on direction of change –positive and negative correlation, (iii) based on change in proportion-linear and non- linear correlation(explanation in brief).Measurement of correlation-scatter diagram method to represent data(brief explanation with merits and demerits),Karl Pearson's coefficient of correlation formula and simple problems on this formula, Spearman's Rank correlation coefficient formula and simple problems on this formula.

Regression- definition, difference between correlation and regression, regression line, regression equation, properties of regression lines, uses of regression analysis. Simple problems on regression equations.

Unit 4 - Probability theory   10 hrs
Definition of probability, experiment, events, sample space. Types of events-simple, composite, equally likely, mutually exclusive, exhaustive, independent and dependent events(definition and examples).Classical definition of Probability with example, axiomatic

definition of probability with example. Union and intersection of two events with example. Definition of conditional probability, statement and proof of addition theorem of probability for two non-mutually exclusive events(theorem of total probability)and problems on this theorem, statement and proof of multiplication theorem of probability for two independent events(theorem of compound probability)and problems on this theorem. Bayer's theorem(statement only).

Unit-5   Probability distributions   08 hrs
Random variable-definition, types of random variables-discrete and continuous(definitions and examples only), definition of probability distribution, definition of mathematical expectation E(X)   and variance V(X) of random variable 'X', types of probability distributions-Bernoulli distribution, Binomial distribution, Poisson distribution and Normal distribution(simple problems on these).

Reference Books:
1. Statistics and probability by B.M Aggarwal
2. Statistics by Rajmohan

QUESTION PAPER PATTERN

PART I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART II 75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions
Question Paper must contain:
 Question 1 from Unit 1
 Question 2 from Unit 2
 Question 3 from Unit 3
 Question 4 from Unit 3
 Question 5 from Unit 4
 Question 6 from Unit 4
 Question 7 from Unit 5

BCA 26   DATA STRUCUTRES USING C

Number of Teaching hours – 48
Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks.

Unit 1-Introduction   10 hrs

Review of structures and pointers(briefly),definition of data structure, types(primitive, noprimitive-linear and non linear).Linear data structure-Stack: Definition and example, operations, representation of stack in C, evaluation of postfix expression, conversion from infix to postfix using stack table. Recursion: Recursive definition, and process, Recursion in C, writing Recursive programs
efficiency of recursion- examples

Unit 2 – Queue   10 hrs

Definition and example, operations, representation of queue in C and its types- Ordinary queue, circular queue, priority queues, double ended queue.

Unit 3- Linked list   10 hrs
Definition and example, stack and queue operations using linked list, insert and delete
node in between a list, circular linked list and doubly linked list (concepts only).

Unit 4- Trees   10 hrs
Tree terminologies, Binary tree, binary tree representation, types of binary tree - linked representation, tree traversals, and binary search tree and their applications, algorithm on searching element in a binary search tree, arithmetic expression in tree representation

Unit 5- Searching and Sorting   08 hrs

Basic search technique, sequential search, and its efficiency searching ordered table- index sequential search, Binary search, interpolation search, binary tree searching, Hashing (open address and close address).Sorting**:** General background, quick sort, insertion sort – simple insertion, shell sort, radix sort, selection sort, binary tree sort,
heap sort, merge sort.

Reference Books:

1. Data structures using C and C++ - Yedidyiah et al
2. Programming in ANSI C - E. Balaguruswamy
3. Data structures and programming design using C - Robert Kruse PIII publications
4. Data structures and applications - Trembly and Sorenson
5. Systematic approach to data structure Padmareddy

QUESTION PAPER PATTERN

PART I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART II 75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions
Question Paper must contain:
 Question 1 from Unit 1
 Question 2 from Unit 1
 Question 3 from Unit 2
 Question 4 from Unit 3
 Question 5 from Unit 4
 Question 6 from Unit 5
 Question 7 from Unit 5

BCA 27   DATA STRUCTURES LAB

Part – A

1. Implementation of stack
2. Evaluation of post fix expression
3. Implementation of queue
4. Implementation of circular queue using structures
5. Shell sort

Part – B
1. Conversion of infix to postfix
2. Implementation of stack using linked list
3. Implementation of queue using linked list
4. Binary tree traversals
5. Quick sort
6. Heap sort
7. Tree sort

PRACTICAL EXAM SCHEME

Record Manual- 10 Marks
Practical Proper - 60 Marks
Viva – voce -   10 Marks

Part –A	One Program Max marks 30	Flowchart/Algorithm	05 Marks
		Program writing	10 Marks
		Error free compilation or partial output	05 Marks
		Correct result with proper display	05 Marks
Part - B	One Program Max marks 30	Flowchart/Algorithm	10 Marks
		Program writing	10 Marks
		Error free compilation or partial output	10 Marks
		Correct result with proper display	05 Marks

THIRD SEMESTER BCA

BCA 33 OBJECT ORIENTED PROGRAMMING WITH C++

Number of Teaching hours – 48

Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks.

Unit 1 - Introduction to C++ and OOPS   08 hrs

Object Oriented Programming paradigm, Basic concepts of Object Oriented Programming-Classes, Objects, Data Abstraction and Encapsulation, Polymorphism, Inheritance, Dynamic binding, Message passing, Benefits of OOP, Object Oriented languages, applications of OOP.C++ features, Comparison with C, Structure of a C++ program, input and output statements Keywords, symbolic constants, type compatibility, declaration of variables, reference variables, operators in C++, control structures.

Unit 2 - Classes Objects and Member Functions   10 hrs

Limitations of structures in C, specifying a class, creating objects, memory allocation for objects static data members, arrays within a class, local classes. Defining member functions, call by reference, return by reference, inline functions, default arguments, making an outside function inline, nesting of member functions, private member functions, function overloading, static member functions, const member functions, pointer to members, friend and virtual functions.

Unit 3 - Constructors and Destructors   10 hrs

Introduction, constructors, parameterized constructors, multiple constructors in a class, constructors with default arguments, dynamic initialization of objects, copy constructor, dynamic constructors, constructing two dimensional arrays, const objects, destructors.

Unit 4 - Operator overloading   08 hrs

Introduction, definition, overloading unary operators, overloading binary operators, overloading operators using friends, string manipulations using operators, rules for operator overloading, type conversions.

Unit 5 - Inheritance and Templates   10 hrs

Inheritance definition, defining derived classes, types-single inheritance, making a private member inheritable, multilevel inheritance, multiple inheritance, hierarchical inheritance, hybrid inheritance, virtual base classes. Template definition, class templates, class templates with multiple parameters, function templates, function templates with parameters.

Reference Books:

1. Object Oriented Programming with C++ - E Balaguruswamy
2. Object Oriented Programming in Turbo C++ - Robert Lafore
3. C++ The complete Language – Bjarne Schildt

QUESTION PAPER PATTERN

PART -I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART- II 75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions
Question Paper must contain:
Question 1 from Unit 1
Question 2 from Unit 2
Question 3 from Unit 2
Question 4 from Unit 3
Question 5 from Unit 4
Question 6 from Unit 5
Question 7 from Unit 5

BCA 34 SYSTEM SOFTWARE

Number of Teaching hours – 48
Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks.

Unit 1 - Machine Architecture   08 hrs

Introduction, System software and machine architecture, Simplified Instructional Computers (SIC) and its architecture, Instruction Formats of IBM-360.

Unit 2 - Assembler   10 hrs

Introduction, General design procedure, design of Assembler, statement of problem, data Structure, Format of Date bases, Algorithm for pass 1 and pass 2, look for modularity. Explanation along with flowcharts for both pass 1 and pass 2 (detail flowchart).Table Processing :Searching & Sorting **-** Linear and binary search , comparison, examples. Interchange sort,, shell sort, bucket sort, radix exchange sort, address calculation sort,. Random entry searching

Unit 3 - Macro Language and macro processor   10 hrs

Introduction, Macro instructions, Features of macro facility-macro instruction arguments, Conditional macro Expansion, Macro calls within macro, Macro instruction defining macro implementation: statement of problem, Specification of databases and specification of database format, Algorithm and flowchart for processing macro definitions and macro expansion

Unit 4 - Loader   10 hrs

Introduction, Loader schemes-compile and go loader scheme, general loader, Absolute loader, Sub routine linkage, Relocating loader, Direct linking loader, overlays, Dynamic loading.

Unit 5 - Compiler   10 hrs

Introduction, Statement of problem, Phases of compiler, Lexical phase, syntax phase, interpretation phase optimization phase, storage assignment phase, code generation phase, Assembly phase, passes of compiler. Data Structures: statement of problem, storage classes and its use.

References:

1. System programming – John. J. Donovan
2. System Software – Leland L. Beck, Third edition, Addison Wesley 1997
3. Systems programming and operating systems – Dhamdare

QUESTION PAPER PATTERN

PART -I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART- II 75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions
Question Paper must contain:
Question 1 from Unit 1
Question 2 from Unit 2
Question 3 from Unit 2
Question 4 from Unit 3
Question 5 from Unit 4
Question 6 from Unit 5
Question 7 from Unit 5

BCA 35   DATABASE MANAGEMENT SYSTEM

Number of Teaching hours – 48
Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks.

Unit 1 - Introduction   10 hrs

Meaning of data and information. Meaning of persistent data, definitions for DBMS, database, database system, examples, database system applications. database management system vs. file management system, views of data, data independence, data models, database languages, database users and administrators, database system structure, application architecture, advantages of using DBMS, classification of DBMS, meaning of schema and instance.

Unit 2 - E-R Model   10 hrs

Using high-level, conceptual data models for database design, basic-concepts, constraints, keys, an example database application, E-R diagram, types of entities, entity sets, attributes, types of attributes, weak entity sets, cardinality ratios (mapping cardinality), specialization, generalization

Unit 3 - Relational Model   12 hrs

Structure of relational Databases, Relational algebra - select, project. union, set difference, rename, division operations, Modification of the database, queries using relational algebra. Extended relational algebra operations.SQL- Background, basic structure, set operation, aggregate functions, NULL values, nested sub queries, Views, complex queries, Modification of the database, joined relations, Data Definition Language, domain constraints, referential integrity in SQL. Assertions, authorization, privileges in SQL, Encryption techniques.

Unit 4 - Relational Database Design   10 hrs

Pitfalls in relational data base design, Normalization for relational databases. Normal forms based on primary keys, General definitions of first, second and third normal forms, Functional Dependency (concept and example) decomposition, Boyce-Codd Normal Form - definition and example, fourth Normal form - Multi valued Dependencies - definition and example.

Unit 5 - Storage and File Structure   06 hrs

Overview of physical storage media, RAID, Organisation of records in files, Data dictionary, Ordered indices, B+ tree, introduction to transactions.

Reference Books:

1. Korth, Sudarshan "Database System concepts", Mcgraw Hill-IV Edition.

2. Navathe, Silberchatz and Elmasri "fundamentals of database Systems"

3. Addison C.J. Date "Introduction to Database systems" Addison-wesley.

4. Bipin C Desai "Introduction to Data base system" Galgotia publications

QUESTION PAPER PATTERN

PART -I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART- II   75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-
(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions
 Question Paper must contain:
 Question 1 from Unit 1
 Question 2 from Unit 2
 Question 3 from Unit 2
 Question 4 from Unit 3
 Question 5 from Unit 4
 Question 6 from Unit 5
 Question 7 from Unit 5

BCA 36   C++PROGRAMMING LAB

PART A

1. Write a c++ program to find the result of a student using class concept
2. Define a class employee having data members name, basic salary, net salary with the member function getdata() , showdata(). Calculate the net salary assuming appropriate % for all allowance and deductions using class concept
3. Define a class to represent product details it includes data member pname, pcode, price, pquality include member function a) to get product detail   b) to display the product details and total price using class concept
4. Write a c++ program to print Fibonacci series using constructor
5. Write a c++ program to find biggest of two numbers and three numbers using function overloading
6. write a c++ program to calculate area of triangle, rectangle and circle using function overloading
7. write a c++ program to calculate family income using friend function

PART – B

8. write a c++ program to add two complex numbers using operator overloading
9. write a c++ program to concatenate two string using operator overloading
10. write a c++ program to implement multiple inheritance by creating classes-father, mother and son
11. write a c++ program to swap two numbers using function template
12. write a c++ program to sort an array using function template
13. Write a c++ program to define a class Bank Account including the following class members.
    DataMembers:, cust name, accno, balance.
    Member Functions: a) getdata(custname,accno,balance).
                       b) display(accno).
                       c) deposit(acno,amt).
                       d) withdrow(accno,amt) updation aftern checking the balance.
                       e) To display name & balance of all the records
14. Write a c++ program to implement multilevel inheritance by creating classes:
    College—> name_id, location,dept
    Student—>name ,reg_no, course, age
    DOB—>date, month, year, place

PRACTICAL EXAM SCHEME

Practical Proper - 60 Marks

Viva – voce   - 10 Marks

Record   - 10 Marks

Part –A		Program writing	15 Marks
	One Program	Error free compilation or partial output	05 Marks
	Max marks 30	Correct result with proper display	05 Marks
Part - B		Program writing	20 Marks
	One Program	Error free compilation or partial output	10 Marks
	Max marks 30	Correct result with proper display	05 Marks

BCA 37 SQL LAB

I. Use the default emp and dept table to write SQL statements for the following queries
1. Find the employee details in ascending order of their name and descending order of their salary
2. Find the name of all managers and number of employees under them
3. Find the details of all employees in the research department
4. Find the minimum, maximum and average salary of each department
5. Find department name having least number of employees
6. Find the department name having highest annual payroll
7. Add an employee under the manager smith
8. Find the employees who are not getting commission

II. Create tables as below
Student(name string, regno string primary key, dob date, doj date ,course string foreign key)
Markscard(regno foreign key, sem string, sub1 number, sub2 number, sub3 number, tot number, avge number, result string)
Write SQL statements for the following queries.
1. List the names of students studying in BCA course in the order of their joining
2. Find the name of student who has scored highest marks in every sem of each course
3. Count the number of students in each course
4. Find the course having second highest number of students
5. Find the course having least students in I semester
6. Display the details of student 'xxx' in every semester.
7. Find the names of al juniors of 'yyy' in course 'c1'
8. Find all students studying with 'xxx' and elder to him (compare DOB)

III Dept(deptno integer pkey, dname string not null, loc string not null)
Emp(eno integer pkey, ename string, deptno fkey, design string not null, bsal number>0)
Salary(eno fkey, da, hra,gross,it,pf,net,comm)
DESGN ARE manager,clerk,salesman
Comm=5% of basic if design=salesman otherwise null
Da=15% bsal   hra = 7% of bsal gross=bsal+da+hra
It =0 if gross<15000
 = 10% of gross if gross between 15000 and 30000
 =20% of gross if gross between 30000 and 50000
 = 30% of gross otherwise
pf = 10% of gross or 1000 whichever is less

Write SQL statements for
1. Count the number of employees in every designation
2. List the employees of every department in descending order of their net salary
3. List the name and salary of highest salary payer in every department
4. List the name of employee paying highest IT
5. List the total IT paid by each department
6. List the departments in every location
7. Raise the basic salary by 10% for the managers of every department.
8. Find the number of employees having atleast 10 years of experience in every department.

IV   Create tables as below
      Employee(eno, ename,street,city)
      Company(cno,cname,city)
      Works(eno,cno,sal)
      Manages(mno,eno)

      Write SQL statements for the following queries
      1. Find the name of all employee working in the city in which they live
      2. Find the company having most employee
      3. Count the number of employees under each manager.
      4. Find the company having second highest payroll
      5. Find employee drawing more salary than his manager in every company
      6. Raise the salary of every manager by 25%
      7. Find name of employees who are not having managers
      8. Find average, highest and lowest salary of every company

PRACTICAL EXAM SCHEME

Practical Proper - 60 Marks
Viva – voce   - 10 Marks
Record   - 10 Marks

Table Creation	2 Tables creation & data insertion from any two cycles	20 marks
SQL queries	2 SQL queries from I cycle and 6 SQL queries from any two other cycles for which tables created	40 marks
	Queries writing 3 marks (each)	
	Execution 2 marks (each)	

NOTE: Examiner has to ask 8 queries from two cycles in which students

should answer minimum 3 queries in any one cycle

FOURTH SEMESTER BCA

BCA 43 JAVA PROGRAMMING

Number of Teaching hours – 48
Theory Examination- 80 Max marks.　　　　　Internal Assessment- 20 Max marks

Unit 1 - Introduction to Java and Java Program Structure　　　　10 hrs

History of Java, Java features, Difference between C/C++ and Java, Java program structure, Java tokens, Statements, JVM, Introduction to packages in Java, Applets, Operators & Expressions, Data types, Constants and Variables, Type conversions, Mathematical functions; Control Statements: Decision making and Branching with while, do-while, for and labeled loops; Arrays, Vectors & Strings: Initialization, Declaration of 1D, 2D arrays, String arrays, String methods, Vectors, Wrapper classes.

Unit 2 - Overview　　　　10 hrs

Class, Objects, Constructor, Method overloading, Static members; Inheritance: Single, Multilevel, Hierarchical, Visibility modes, Method overriding, Final variable, Abstract methods and classes; **Interface**: Defining, Extending and Implementing assigning interface variables

Unit 3 -Packages and multithreading　　　　10 hrs

Java API Packages, using system packages, naming convention, accessing and using a package, adding a class to packages, hiding classes. Multithreaded programming: Creating a thread, extending the thread class, stopping and blocking a thread, life cycle of a thread, using thread methods, thread exceptions, thread priority, synchronization, implementing the runnable interface.

Unit 4 - Exceptions and Debugging　　　　10 hrs

Meaning of errors and exceptions, Dealing with errors, Classifications of exceptions, syntax of handling exceptions, advertising the exceptions, throwing and rethrowing exceptions, creating Exception classes, multiple catch statements, finally clause, tips for using exceptions, Debugging techniques – tricks for debugging, Assertions, Java Debugger (JDB).

Unit 5 - Applets and Graphics　　　　08 hrs

Applets basics, applets and application, Life cycle, Life cycle of Applet programming- passing parameter to applets, paint and repaint methods, Graphics class, Line, Rectangle, Circle, Ellipse, Arcs and Polygon. Using control loops in applets, drawing bar charts.

Reference Books:

1. Java, The Complete Reference – Patrick Naughton and Schildt
2. Programming in Java – Joseph L Weber
3. Java Programming – E Balaguruswamy

QUESTION PAPER PATTERN

PART I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART II 75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions
Question Paper must contain:
 Question 1 from Unit 1.
 Question 2 from Unit 1
 Question 3 from Unit 2
 Question 4 from Unit 2 and 3
 Question 5 from Unit 3
 Question 6 from Unit 4
 Question 7 from Unit 5

BCA 44   COMPUTER GRAPHICS

Number of Teaching hours – 48
Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks

Unit 1 - Introduction to Multimedia   10 hrs

Definition, CD-ROM and the multimedia highway, Uses of Multimedia, Introduction to making multimedia – The stages of Project, the hardware & software requirements to make good multimedia, Multimedia skills .Multimedia building blocks- SOUND: MIDI, Digital audio, audio file formats. Images: still images, color and file formats. ANIMATION: principles of animation, making animation. VIDEO: using video, how video works, and video standards.

Unit 2 - Introduction to Graphics applications   10 hrs

CAD , presentation graphics, computer art, entertainment, education and training, visualization, image processing. Display devices – raster scan displays – color CRT, DVST, LCD, 3D viewing devices. Raster scan systems, Random scan systems. List of I/O devices.

Unit 3 - Output primitives   10 hrs
Points and lines, line drawing algorithm, DDA algorithm, Bresenham's line algorithm, examples, parallel line algorithm, loading the frame buffer, circle generating algorithm, midpoint circle algorithm, ellipse generating algorithm. Pixel addressing and object geometry. Color and gray scale levels, color tables, character attributes.

Unit 4 - 2D Transformation   10 hrs
Basic Transformations- translation,. Scaling, rotation, matrix representation and homogeneous coordinates, composite transformations- translation, scaling, general pivot point and fixed point rotation, scaling directions, other transformations – reflection, shear, transformation between coordinates, inverse transformations.

Unit 5 - Windowing and Clipping   08 hrs
Introduction, the viewing transformation, viewing transformation implementation, clipping, the Cohen-Sutherland outcode algorithm, Liang-Barsky line clipping algorithm, the Sutherland-Hodgeman algorithm, the clipping of polygons and adding clipping to the system, text clipping, exterior clipping, curve clipping.

Reference Books:

1. Tay Vaughan "Multimedia – making it work", TMH publication, fifth edition.
2. D Hearn & M P Baker: "Computer Graphics C version", Pearson Education
3. D Newman and Sproull: "Principles of Interactive Computer Graphics -, TMH,II edition.
4. Steven Harrington "Computer graphics: A programming Approach", TMH publication. Second edition
5. Roy plastock and Zhigang Xiang: " Computer graphics". Schaum's outline series, II edition.

QUESTION PAPER PATTERN

PART I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART II 75 Marks
There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions
Question Paper must contain:
 Question 1 from Unit 1.
 Question 2 from Unit 2
 Question 3 from Unit 3
 Question 4 from Unit 3
 Question 5 from Unit 4
 Question 6 from Unit 5
 Question 7 from Unit 5

BCA 45   Data Warehousing and Data Mining

Number of teaching hours – 48

Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks

Unit 1 - Data Warehousing and OLAP   10 hrs

Data Warehouse basic concepts, Data Warehouse Modeling, Data Cube and OLAP, Data warehouse Schemes.

Unit 2 - Data Mining   10 hrs

Introduction, Data Mining, Motivating Challenges, Data Mining Tasks, Technologies, Data Mining Applications, Data Preprocessing.

Unit 3 - Association Analysis   10 hrs

Frequent Item set Generation, Rule Generation, Compact Representation of Frequent Item sets

Unit 4 - Classification   10 hrs

Basics, General approach to solve classification problem, Decision Trees, Rule Based Classifiers, Nearest Neighbor Classifiers.

Unit 5 - Methods, Improving accuracy of Classification   08 hrs

Methods, Improving accuracy of clarification methods, Evaluation criteria for classification methods, Multiclass Problem.

Text Books:
1. Pang-Ning Tan,Michael Steinbach,VipinKumar: Introduction to DataMining, Addison- Wesley, 2005.
2. G.K.Gupta:Introduction to DataMiningwithCaseStudies,3rd Edition,PHI,NewDelhi,2009

Reference Books:
1. Arun K Pujari: Data Mining Techniques University Press, 2nd Edition, 2009.
2. JiaweiHan and Micheline Kamber : Data Mining-Concepts and Techniques, II Edition, Morgan Kaufmann Publisher,2006.
3. Alex Berson and Stephen J.Smith: Data Warehousing, Data Mining, and OLAP Computing, McGrawHill Publisher, 1997.

QUESTION PAPER PATTERN

PART -I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.

The student has to attend all the 05 questions.

PART -II 75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.

The student has to attend any 05 full questions

Question Paper must contain:

 Question 1 from Unit 1.

 Question 2 from Unit 1

 Question 3 from Unit 2

 Question 4 from Unit 2 and 3

 Question 5 from Unit 3

 Question 6 from Unit 4

 Question 7 from Unit 5

BCA 46 JAVA PROGRAMMING LAB

PART A

1. Write a Java program to generate first n odd numbers and pick and display prime numbers among them. Read value for n as command line argument.
2. Write a Java program to create a vector, add elements at the end, at specified location onto the vector and display the elements. Write an option driven program using switch…case.
3. Write a java program to find area of geometric figures (at least 3) using method overloading.
4. Write a Java program to find the circumference and area of the circle using interface.
5. Write a java program to perform matrix addition and multiplication using case statement
6. Write a java program to accept student information using array of objects and constructor initialisation.
7. Write a java program to accept student, employee information to perform relevant computation using hierarchical inheritance.

PART B

8. Write a java program to implement static and dynamic stack using interface using abstract class.
9. Write a java program to implement constructor overloading by passing different number of parameter of different types.
10. Define a package to contain the class sort to contain methods for various sorting techniques with time complexity (at least 3)Use this package to sort the list
11. Write a Java program to generate odd, even and Fibonacci numbers simultaneously using the concept of multi-threading.
12. Write a program to implement an applet by passing parameter to HTML
13. Write an applet program to display human face
14. Create an applet to display concentric n circles, input value for n.

PRACTICAL EXAM SCHEME

Practical Proper - 60 Marks

Viva – voce   - 10 Marks

Record   - 10 Marks

Part –A	One Program Max marks 30	Program writing	15 Marks
		Error free compilation or partial output	10 Marks
		Correct result with proper display	05 Marks
Part - B	One Program Max marks 30	Program writing	15 Marks
		Error free compilation or partial output	10 Marks
		Correct result with proper display	05 Marks

BCA 47 COMPUTER GRAPHICS PROGRAMMING LAB

PART A
1. Write a program to draw borders at the four corners of the screen.
2. Write a program Write a program to implement DDA line drawing algorithm
3. Write a program to implement Bresenham's line drawing algorithm
4. Write a program to implement Bresenham's line drawing algorithm for |m|<1
5. Write a program to implement Parallel line algorithm
6. Write a program to implement Mid point circle algorithm
7. Write a program to implement Ellipse generating algorithm

PART B

8. Write a program to continuously rotate an object about origin. Small angles to be used for successive rotation.
9. Write a program that applies any specifies sequence of transformations to a displayed object. The program is to be designed so that a user selects the transformation sequence and associated parameter from displayed menus, and the composite transformation is then calculated and used to transform the object. Display the original and transformed objects in different colours or different fill patterns.
10. Write a program to demonstrate clipping by defining world and viewing coordinates
11. Write a program to implement Cohen Sutherland line clipping algorithm
12. Write a program to implement Sutherland - Hodgeman polygon clipping algorithm

PRACTICAL EXAM SCHEME

Practical Proper - 60 Marks

Viva – voce - 10 Marks

Record - 10 Marks

Part –A		Program writing	15 Marks
	One Program	Error free compilation or partial output	05 Marks
	Max marks 30	Correct result with proper display	05 Marks
Part - B		Program writing	20 Marks
	One Program	Error free compilation or partial output	10 Marks
	Max marks 30	Correct result with proper display	05 Marks

FIFTH SEMESTER BCA
BCA 51   ADVANCED PROGRAMMING IN JAVA

Number of teaching hours – 48

Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks

Unit 1 - Review of Java Concepts and AWT, Graphics Programming   10 hrs

Review of Java Concepts .AWT and AWT Classes, Window fundamentals – Component, Container, Panel, Window, Frame, Canvas. Working with frame window. Graphics Programming: Graphics class, methods, drawing objects, line graphs, polygon classes, working with colors and fonts. Advanced graphics operations using Java2D. Designing simple User Interfaces (UIs) using AWT, Layout Manages.

Unit 2 - Swing, Event Handling and Event Handling: 10 hrs

Event Handling: Basics of Event Handling, the delegation event model, AWT event hierarchy and event classes, Event Listener Interfaces, Adapter Classes, Event queue. Swing: Meaning, need difference between AWT and swing. The Model-View-Controller (MVC) design patterns, Creating simple UIs using swing, and handling basic events.

Unit 3 - Java Beans, Java Archives (JAR)   10 hrs

Meaning and need of Java Beans, Advantages, Bean writing process, Bean properties. Java Archives (JARs): Meaning, need, the JAR utility, Creating JAR files.

Unit 4 - File Management and JDBC   10 hrs

File, creating a file, writing to a file, opening a file, reading from a file, file management, checking existence of a file, deleting a file. JDBC: Meaning, need, concept and structure of JDBC, relation with ODBC, JDBC driver types and their meaning, the JDBC process – loading the driver, connecting to the DBMS, creating and executing SQL statement, Connection object, Statement object, Prepared Statement object, Callable Statement, Result Set, JDBC Exceptions.

Unit 5 -Fundamental concepts of Collections, Generics and Network programming   08 hrs

Collections: Meaning, need, Collection interfaces, Concrete Collections – Array List, Hash set, Map. Generics**:** Meaning, need, benefits, generics usage, basics of generic types, type parameter naming conventions, type wildcards, using type wildcards, generic methods, bound types, writing simple generic container, implementing the container, implementing the constructors, implementing generic methods. Network programming**:** Meaning of Client, Server, Socket, port. Creating a client socket, creating a server socket, writing simple server and client.

Reference books:
1. The Complete Reference – Java 2: Herbert Schildt, 5th Edition, Tata McGraw-Hill
2. Thinking in Java: Bruce Eckel
3. Core Java 2: Volume I – Fundamentals: Cay S. Horstmann, Gary Cornell, Pearson Education Asia.
4. Core Java 2: Volume II – Advanced Features: Cay S. Horstmann, Gary Cornell, Pearson Education Asia.

QUESTION PAPER PATTERN

PART I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART II 75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions
Question Paper must contain:
 Question 1 from Unit 1
 Question 2 from Unit 2
 Question 3 from Unit 2
 Question 4 from Unit 3
 Question 5 from Unit 4
 Question 6 from Unit 5
 Question 7 from Unit 5

BCA 52   Data Communication

Number of Teaching hours – 48
Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks

Unit 1 - Introduction to Data Communication   08 hrs

Communication model & Data Communication networking -types. Data Transmission-
Transmission terminology, Analog & Digital data transmission, Transmission impairments –
attenuation, delay distortion & noise.

Unit 2: Data Transmission media   10 hrs

Guided Transmission- types- Twisted pair, coaxial cable & optical fiber – physical description,
application & characteristics. Unguided Transmission- wireless transmission: types- Terrestrial
type, Satellite, Broadcast radio – physical description, application & characteristics.

Unit 3: Data encoding   10 hrs

Basics, types and description of different signals, Digital data & digital signals: NRZ, multilevel
binary, Bi phase techniques. Digital data & Analog signals: Encoding techniques- ASK, FSK,
PSK Analog data & Digital signals: PCM & delta modulation Analog data & Analog signals:
Modulation- AM & FM Spread spectrum: Frequency hoping, direct sequence Asynchronous &
synchronous transmission: Line configurations- full duplex & half duplex.

Unit 4 - Data link control & medium access sub   10 hrs

Flow control: Stop and wait & sliding window flow control. Error detection: Parity check, CRC
Error control: Stop and wait ARQ, Go Back-N ARQ High-level data link control: basics,
Characteristics, frame structure, operation Medium access sub layer- the channel allocation
problem. Multiple access Protocol-ALOHA, carriers sense multiple access protocol, collision
free protocol.

Unit 5 - Multiplexing and Switching   10 hrs

 Frequency division multiplexing- characteristics, anlog carrier systems, Time division
multiplexing- characterstics, link control. Digital carrier system, ISDN user network interface.
Circuit switching networks- switching concept, space division & time division switching- Pocket
switching networks-principles, switching technique, and packet size. Comparison of Circuit
switching & Pocket switching

Reference books:

1. Data and Computer Communications – William Stallings.
2. Computer Networks – Andrew S. Tanenbaum.
3. Data Communication – Ulysis D Black.
4. Data Communication and Networking – Behrouz A. Forouzan.
5. Internetworking with TCP/ IP – Douglas E comer, PHI

QUESTION PAPER PATTERN
PART I 05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART II 75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions
 Question Paper must contain:
 Question 1 from Unit 1.
 Question 2 from Unit 2
 Question 3 from Unit 3
 Question 4 from Unit 3
 Question 5 from Unit 4
 Question 6 from Unit 5
 Question 7 from Unit 5

BCA 53   Web programming with J2EE Concepts and PHP

Number of teaching hours – 48
Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks

Unit 1 – Introduction   08hrs

Internet, WWW, Web Browsers and Web Servers, URLs, HTTP, Evolution of the Web, Peak into the History of the Web, Internet Applications, Important Components of the Web, Web Search Engines, Application Servers.HTML and DHTML Concepts : Programming structure, different basic tags , Images, Hyper text Links. Lists, Tables, Forms, Frames. Cascading Style Sheets**:** Introduction, Levels of style sheets, Style specification formats, Selector forms, Property value forms, Font properties, List properties, Color, Alignment of text, The box model, Background images, The<span> and <div> tags.

Unit 2 – The JavaScript   10 hrs

Overview of JavaScript, Execution Environment, Object orientation and JavaScript, Syntactic characteristics, Primitives, operations, and expressions, Arrays, Functions, Pattern matching using regular expressions, Examples. Events and Event Handling,

Unit 3 – Client – Server Systems   10 hrs

Meaning of client and server, Client-Server architecture, benefits, concept of ports and sockets. Protocol – Meaning, definition, examples, meaning of stateless and state (state full) protocols. HTTP protocol – meaning, http protocol request and response header formats, status codes. Client-Server communication scenario.

Unit 4 – JEE Technology Concepts   10 hrs

Multi-tier architecture for application development – Meaning, need, advantages. Meaning of enterprise application and web application, various tiers in enterprise application – client tier, web tier, business tier, enterprise information system tier. Introduction to JEE concepts – Need, advantages, characteristics of JEE technology, the concepts of containers, components and services – meaning of web container, application client container, EJB container.

Unit 5 – Basics of PHP and Java Server Pages Programming Concepts   10hrs

Introduction to JSP - language structure, advantages, characteristics, comparison between Java and Java Server Pages. Various aspects of Java Server Pages programs, writing and executing JSP programs. Writing dynamic programs using JSP. Database programming through JSP. Basics of PHP : Introduction ,variables ,functions, sessions, date, mysql integrations with php, file uploading.

Reference books:
1. The Complete Reference – J2EE – Jim Keogh
2. J2EE – Kevin Mukhar, James L. Weaver, James P Crume, Ron Phillips
3. learning php and mysql 4th Edition Robin Nixon.
4. Begining php-5 and Mysql Cristian Darie.

QUESTION PAPER PATTERN

PART I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.

The student has to attend all the 05 questions.

PART II 75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.

The student has to attend any 05 full questions

Question Paper must contain:

Question 1 from Unit 1.

Question 2 from Unit 1

Question 3 from Unit 2

Question 4 from Unit 3

Question 5 from Unit 4

Question 6 from Unit 5

Question 7 from Unit 5

BCA 54   OPERATING SYSTEM

Number of teaching hours – 48
Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks

Unit 1 – Introduction   10 hrs
Definition of Operating System, need. Early systems – Simple monitors, Batch Systems. Multiprogramming, Time Sharing, Real time, Parallel and Distributed systems. Special Purpose Systems – Real Time Embedded Systems, Multimedia Systems, Handheld Systems. Computing Environments – Traditional, Client Server, Peer-to-Peer and Web based. Open Source Operating Systems.

Unit 2 – Process Management   10 hrs
Process concept – meaning of process, sequential and concurrent processes, process state, process control block, threads, Process scheduling – scheduling queues, schedulers, context switch. Operations on Processes – creation and termination. Inter process communication – Independent and co-operating processes. Communication in client-server systems – RPC and RMI. Process scheduling – Basic concepts

Processor - CPU I/O burst cycle, CPU Scheduler, Preemptive scheduling, dispatcher. Scheduling criteria, Scheduling algorithm – First-Come-First-Served (FCFS), Shortest Job First (SJF), Priority Scheduling, Round Robin. Multi-level queue scheduling (Concepts only), multi-level feedback queue scheduling (Concepts only). Multiple processor scheduling, Real time scheduling.

Unit 3 – Deadlocks   10 hrs

Definition with example, System model, Dead lock characterization – Necessary Conditions, Resource Allocation Graph, Dead lock prevention, Avoidance and detection, Recovery from dead lock.

Unit 4 – Memory Management   10 hrs

Logical and Physical address space, Swapping, Contiguous allocation, Paging, Segmentation, Virtual memory - demand paging and its performance, Page replacement algorithms, Allocation of frames, Thrashing.

Unit 5 – Disk and File Management   08 hrs

Secondary Storage Structure and Disk Management: Disk structure & scheduling methods, Disk management, disk reliability. File concepts, Access methods, Directory structure, Protection and consistency semantics, File system structure, Allocation methods, free space management.

References:

1. Abraham Silberschatz and Peter Baer Galvin, Operating System Concepts, Fifth edition, Addison - wesley 1989.

2. Milan Milonkovic, Operating System Concepts & Design, II Edition, McGRaw Hill 1992.

3. Stallings, Operating Systems, Pearson Edition.

4. Tanenbaum, Operating System Concepts, Pearson Education

5. Nutt : Operating System, 3/e Pearson Education 2004

QUESTION PAPER PATTERN

PART -I 05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART- II 75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions
Question Paper must contain:
 Question 1 from Unit 1
 Question 2 from Unit 2
 Question 3 from Unit 2
 Question 4 from Unit 3
 Question 5 from Unit 4
 Question 6 from Unit 5
 Question 7 from Unit 5

BCA 55 SOFTWARE ENGINEERING

Number of teaching hours – 48
Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks

Unit 1 – Introduction   10hrs
Definition of software, software problems (industrial strength software, software is expensive, late and unreliable maintenance and rework), software engineering challengers (scale, quality and productivity, attributes), software engineering approach (phased development process, managing process, components.

Unit 2 – Software processes   10hrs
Introduction to software process (processes and process modules, component of software process), characteristics of software process (predictability, support   testability and maintainability, support change, early defect removal, process improvement and feedback), software process models (waterfall, prototype, iterativ enhancement model, spiral, comparison of process models).

Unit 3 – Software Planning   10hrs
Introduction to planning, effort estimation (uncertainties, building efforts, bottom-up, COCOMO model), project scheduling and staffing (overall, detailed scheduling, team structure), risk management (concepts, assessment), project monitoring plan (measurements, project monitoring and tracking).

Unit 4 – Analysis and Design   10hrs
Software requirements (needs and requirement process), problem analysis   (informal approach, data flow modeling, object oriented modeling, prototyping), requirement specification (characteristics of SRS, components of SRS, specification language, structure of requirement document), validation. Design: Function oriented design: design principles, module level concept (coupling, cohesion), structure design methodology (DFD, first level factoring).

Unit 5 -Coding and Testing   08 hrs
Coding: programming principles and guidelines (common coding errors, structured programming, information hiding, some programming practices, coding standards), refactoring (basic concepts with examples, common refactoring), verification (code inspections, static analysis, proving correctness, unit testing).Testing: testing fundamentals, black box and white box testing, comparison between black box and white box testing, testing process (levels of testing, test plan).

Reference books:

1.An integrated approach to software engineering-Pankaj Jalote.
2.Roger Pressman, Software Engineering- A Practitioner's Approach TMH
3.Ian Sommerville, Software Engineering, Pearson Publications Ltd.

QUESTION PAPER PATTERN

PART I 05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART II 75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions
Question Paper must contain:
Question 1 from Unit 1.
Question 2 from Unit 2
Question 3 from Unit 2
Question 4 from Unit 3
Question 5 from Unit 4
Question 6 from Unit 5
Question 7 from Unit 5

BCA 56 WEB PROGRAMMING LAB WITH J2EE CONCEPTS AND PHP

Part – A

1. Create a webpage using html to display college information with appropriate images and list of departments.
2. Create a webpage using html to display the below mentioned table (use appropriate colors):

Name		Place
Rama	R	Bhadravathi
Kumar	B	Shimoga
Rajesh	S	Thirthahalli
Ramakrishna	RK	Bhadravathi

3. Create a webpage with two images which alternately changes on mouse over using CSS.
4. Create a webpage to display system date in the given format: Ex: 01 January 2016
5. Create a webpage to demonstrate the use of external Cascading Style Sheets
6. Create a webpage to demonstrate the use of span and div tags in DHTML.
7. Create a webpage with two textboxes and command buttons to perform arithmetic operations and display the result in appropriate dialog boxes using JavaScript.
8. Create a webpage to convert a given text from uppercase to lowercase using JavaScript.

Part – B

9. Write a JSP application to read the details of a student and store the same on to the MS Access database.
10. Write a JSP application to evaluate the salary details of an employee and store the same in the MS Access database table.
11. Write a multilayered JSP program to evaluate the result of a student. Consider student name, register number, marks obtained in 5 subjects as input and read them by writing a proper user interface JSP. Evaluate the total marks, percentage marks and grade by writing a process JSP. While evaluating the grade verify whether the student has cleared all the papers. Display the output with proper marks list format by using <TABLE> tag.

College Name
Marks List
Name of the Student   :
Register Number   :

Subjects	Max. Marks	Min. Marks	Marks Obtained
1. Subject1	100	40	--
2. Subject2	100	40	--
3. Subject3	100	40	--
4. Subject4	100	40	--
5. Subject5	100	40	--
Total Marks	500	200	--
Percentage Marks:	-- %		
Grade:	----		

12. Write a multilayered JSP application to accept and store student information. Accept student name, register number, course, combination, semester, marks obtained in five subjects as input through a proper user interface page. Design course, combination and semester as combo boxes. Store the accepted details in the MS Access table.

13. Write a multilayered JSP application to read and store employee information. Read employee name, employee identification number, Department, Designation, Basic Salary, TA, DA, HRA, PF, LIC (in percentage) as input through a proper user interface page. Also calculate TA Amount, DA Amount, HRA Amount, PF Amount, LIC Amount, Total Allowances, Total Deductions, Gross Salary and Net Salary components of the employee. Along with the employee information store the salary details in the MS Access table.

14. Write a program to connect the mysql-database and display connection status using PHP.

15. Write a program to upload and display an image using PHP.

PRACTICAL EXAM SCHEME

Practical Proper - 60 Marks

Viva – voce -   10 Marks

Record   10 Marks

Part –A	One Program Max marks 25	Program writing	15 Marks
		Error free compilation or partial output	05 Marks
		Correct result with proper display	05 Marks
Part - B	One Program Max marks 35	Program writing	20 Marks
		Error free compilation or partial output	10 Marks
		Correct result with proper display	05 Marks

BCA 57 ADVANCED JAVA PROGRAMMING LAB

Part A

1. Write an Applet program to design a user interface to key-in the details of an employee.
2. Write an applet to add, remove, select an item in a list
3. Write a applet display select geometric figure from a list.
4. Write a program to implement mouse events
5. Write a program to implement keyboard events
6. Write a Java program (console) to store the typed text to a file.
7. Write a Java program to display the content of a file.
8. Write a Java program to edit the content of a file.

Part B

9. Write a Java program with JDBC to store the details of a person on to an Oracle database table.
10. Write a Java program with JDBC to access and display the details of a person stored in an Oracle database table.
11. Write a Java program with JDBC to access and delete the details of a given person stored in an Oracle database table.
12. Write a Java GUI program to accept the details of an employee and store the same on to an Oracle database table.
13. Write a Java GUI program to access and display the details of a given employee stored in Oracle database table.
14. Write a Java program to design a simple Client and Server components. Pass simple text (static) from client to the server and a receipt acknowledgement (static) back to the client.
15. Write a Java program to demonstrate the use of generics.

PRACTICAL EXAM SCHEME

Practical Proper - 60 Marks

Viva – voce -   10 Marks

Record   10 Marks

Part –A	One Program Max marks 25	Program writing	15 Marks
		Error free compilation or partial output	05 Marks
		Correct result with proper display	05 Marks
Part - B	One Program Max marks 35	Program writing	20 Marks
		Error free compilation or partial output	10 Marks
		Correct result with proper display	05 Marks

SIXTH SEMESTER BCA
BCA 61 COMPUTER NETWORKS

Number of teaching hours – 48

Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks

Unit 1 - Basics   10 hrs

Uses of computer networks, network hardware- broadcast networks, point – to -point networks, network software-protocol hierarchies, design issues, interface & services, connection oriented & connection less services, service primitives

Unit 2: Reference models   10 hrs

OSI reference model- description of each layer. TCP/IP reference model, comparison of the two models, Critique of the OSI model and protocols, Critique of the TCP/IP model and protocols, Example networks-ARPANET,ATM.

Unit 3: The network layer   10 hrs

Design issues, routing algorithms- the optimality principle, shortest path routing, distance vector routing, and link state routing. Congestion control algorithms- general principle, Congestion prevention policies, traffic shaping. The network layer in the internet - the IP protocol, IP address, and subnet. Internet control protocol.

Unit 4: The transport layer   10 hrs

The transport service- services provided to the upper layer, quality service, and transport service primitives. Elements of transport protocol - addressing, establishing a connection, releasing a connection. A simple transport protocol- the example service primitives, the example transport entity. The Internet transport protocol (TCP & UDP)- the service model, the TCP segment header, the TCP connection management. UDP - header.

Unit 5: The Application layer   08 hrs

Network security - traditional cryptography, two fundamental cryptographic principles, secret key & public key algorithms. DNS - Name space, SNMP - model. Electronic mail, architecture and services, www.

Reference books:

1. Data and Computer Communications – William Stallings.
2. Computer Networks – Andrew S. Tanenbaum.
3. Data Communication – Ulysis D Black.
4. Data Communication and Networking – Behrouz A. Forouzan.
5. Internetworking with TCP/ IP – Douglas E comer, PHI

QUESTION PAPER PATTERN

PART I   05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.
The student has to attend all the 05 questions.

PART II 75 Marks

There shall be 07 questions carrying equal 15 Marks .Each question must contain sub-questions-
(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.
The student has to attend any 05 full questions
Question Paper must contain:
Question 1 from Unit 1.
Question 2 from Unit 2
Question 3 from Unit 2 and 3
Question 4 from Unit 3
Question 5 from Unit 4
Question 6 from Unit 4
Question 7 from Unit 5

BCA 62   DOT NET PROGRAMMING

Number of teaching hours – 48

Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks

Unit 1 - Introduction to C# & .NET platform and Building C# Applications   08hrs

Introduction to C# and .NET platform : .NET solution, Building blocks of the .NET platform(CLR, CTS, CLS), Role of .NET base class libraries, .NET Aware programming languages, role of common intermediate languages & type metadata and assembly manifests, A tour of the .NET namespaces.

Building C# Applications : Role of the command line complier(csc.exe), Building a C# application using csc.exe, the command line debugger(cordbg.exe), using the visual studio .NET IDE & its debugging, C# "pre-processor" directives.

Unit 2 - C# language fundament mentals   10hrs

Anatomy of a basic C# class, creating objects: constructor basics, Default assignments & variables scope, variables initialization syntax, basic inputs & output with the console class, understand static methods, arrays & string manipulations, Encapsulation Services, Class Properties , Read   and   Write only Properties, Static Properties, Inheritance Is As keyword Usage, Controlling Base Class Creation With Base, Sealed Classes, Delegation , Polymorphism, The Virtual and Override Keywords ,Abstract Classes, Abstract Methods

Unit 3 - Exception & object life time and Interface and Collections   10hrs

Exception & object life time :The Basics of Object Life Time, The Role Of Application Roots, Understanding Object Generations, The Role Of .NET Exception Handling ,Throwing a Generic Exception ,Catching Exceptions, Properties of Exception, Multiple Exception (Concepts Only),The Finally Block

Interface & Collections : Definition, Implementing an Interface in C#, Interface members at object level, Interface as Parameters, Interface as Return Values, Arrays of Interface Types, Interface Hierarchies, Interface as polymorphic agents, Exploring the system. collections Namespaces.

Unit 4 - Introducing windows forms   10hrs

Overview of the system. windows. Forms Namespaces, An Anatomy of a Form, A Simple Form Program, Function   with Control Class, The Functionality Of the Form Class, Component class, control class, Programming with windows forms controls : Working with Button types, Check Boxes, Radio Buttons, Group Boxes, List Boxes, Calender control, assigning tool tips for controls.

Unit 5 - Data access with ADO.NET   **10hrs**

The Two Faces Of ADO.NET, Understanding ADO.NET Data Providers, Understanding The Connected Layer of ADO.NET, Working with Connection Object, Inserting, Updating and Deleting Records

References Book:

1 Pro C# with .NET 3.0 ------ Andrew Troelsen

2 C# Programming -------------- E Balaguruswamy

QUESTION PAPER PATTERN

PART I 05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.

The student has to attend all the 05 questions.

PART II 75 Marks There shall be 07 questions carrying equal 15 Marks.

Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.

The student has to attend any 05 full questions

Question Paper must contain:

Question 1 from Unit 1.

Question 2 from Unit 1

Question 3 from Unit 2

Question 4 from Unit 3

Question 5 from Unit 3

Question 6 from Unit 4

Question 7 from Unit 5

BCA 63   UNIX Operating System

Number of teaching hours – 48

Theory Examination- 80 Max marks.   Internal Assessment- 20 Max marks

Unit 1 - Introduction   08 hrs

The Unix operating system, , A brief Session, The Unix Architecture, Features of UNIX, POSIX and Single UNIX specification, Locating commands, Internal and External commands, Command Structure, Flexibility of command Usage, Man Browsing the Manual Pages ON-line, Understanding the man Documentation. General-Purpose Utilities: Cal command, date command, echo, printf, bc, script, passwd, who, uname.

Unit 2 - The File System   10 hrs

The file, The Parent –Child Relationship, The HOME Variable, pwd, cd, mkdir, rmdir, Absolute Pathname, Relative Pathname, ls, The Unix File system. Handling Ordinary Files: Cat, cp, rm, mv, more, The lp subsystem: Printing a File, File, wc, od, cmp, comm, diff, dos2unix and unix2dos, compressing and archiving files, gzip, and gunzip, tar, zip and unzip.

Basic File Attributes: Listing file attributes, listing directory attributes, File Ownership, File Permissions, changing file permissions, Directory Permissions, Changing File Ownership.

Unit 3 - The Vi Editor   10 hrs
Vi basics, Input Mode, Saving Text and Quitting, Navigation, Editing Text, Undoing Last Editing Instructions(U and U), Repeating the last command(.), Searching for a Pattern(/ and ?), Substitution.

Unit 4 - The process   10 hrs
 Process basics, process status, system process, Mechanism of process creations, Internal and external commands, process states and zombies, running jobs in background, nice, killing process with signals, job control, at and batch, cron, timing process.

Simple filters: The sample database, pr, head, tail,cut, paste, sort, uniq, tr, displaying a word-count list. Filters using regular expressions: grep, basic regular expressions, extended regular expressions.

Unit 5 - The Shell   08 hrs
The shell's Interpretive Cycle, Shell Offering, Pattern Matching, Escaping and Quoting, Redirection, /dev/null and /dev/tty, Pipes, tee, Command Substitution, Shell variables. Essential shell programming: Shell scripts, read, using command line arguments, exit and exit status of command, the logical operators && and ||- conditional execution, the if conditional, using test and to evaluate expressions, the case conditional, expr, $0: calling a script by different names, while, for, set and shift, the here document (<<), trap, debugging shell scripts with set –x, sample validation and data entry scripts.

References :
1. Sumitabha Das, UNIX System V.4, Concepts and Applications, TMH

QUESTION PAPER PATTERN

PART I 05 Marks

There shall be 05 questions from all the Units and each carrying 01 Marks.

The student has to attend all the 05 questions.

PART II 75 Marks

There shall be 07 questions carrying equal 15 Marks. Each question must contain sub-questions-(a),(b),(c) and marks of a sub- question should not be more than 05 Marks.

The student has to attend any 05 full questions

Question Paper must contain:

Question 1 from Unit 1.

Question 2 from Unit 2

Question 3 from Unit 2

Question 4 from Unit 3

Question 5 from Unit 4

Question 6 from Unit 4

Question 7 from Unit 5

BCA 64 UNIX LAB

PART A

1. Write a shell script to count the number of characters in a given string.
2. Write a shell script program to perform all arithmetic operation on floating point
3. Write a shell script program to check whether the given no. is positive or negative.
4. Write a shell script program to find area of a square, rectangle, circle and triangle.
5. Write a shell script program to reverse a number.
6. Write a shell script program to find sum of digit of a no.
7. Write a shell script program to add, subtract, multiply the two given numbers passed as command ling arguments.
8. Write a shell script program to read data from command line argument and print 1st and 2nd command line argument and print how many no. of argument user has given.

Part – B

1. Write a shell script program to read pattern and file name and search whether the given pattern is present in a file or not, with suitable validation.
2. Write a shell script program to check whether the given file is present in a directory and check what are all the permission given for the owner.
3. Write a shell script program to read filename from command line argument and check whether the file is regular file or directory or by both.
4. Write a shell script program to read 2 filename and check which 1 is newer and which 1 is older.
5. Write a shell script program to find the number of directory files and ordinary files in the current directory.
6. Write a shell script program to perform the following any 1 operation based on your own
   a. choice.
   b. show first 5 line data
   c. show last 3 line data
   d. sort the data
   e. find out word count

7. Write a shell script program to perform the following any 1 operation on your own choice.

    a. list the file

    b. process the user

    c. today's date

    d. user of the system

    e. exit

PRACTICAL EXAM SCHEME

Practical Proper - 60 Marks

Viva – voce -   10 Marks

Record   10 Marks

Part –A		Program writing	15 Marks
	One Program	Error free compilation or partial output	10 Marks
	Max marks 30	Correct result with proper display	05 Marks
Part - B		Program writing	15 Marks
	One Program	Error free compilation or partial output	10 Marks
	Max marks 30	Correct result with proper display	05 Marks

BCA 65 PROJECT LAB

 The objective of the project is to motivate them to work in emerging/latest technologies, help the students to develop ability, to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and research laboratories.

 The project is of 3 hours/week for one (semester VI) semester duration and a student is expected to do planning, analyzing, designing, coding and implementing the project. The initiation of project should be with the project proposal. The synopsis approval will be given by the project guides.

  The project proposal should include the following:

☐ Title

☐ Objectives

☐ Input and output

☐ Details of modules and process logic

☐ Limitations of the project

☐ Tools/platforms, Languages to be used

☐ Scope of future application

  For the project work, the guide(internal) evaluate the work for 20 marks based on the performance of the candidates during the development of he project and the external examiner will evaluate the project work as follows:

☐ Project Report   - 20 marks

☐ Project Demo   -30 Marks

☐ Viva-Voce   - 30 marks

 The Project work should be either an individual one or a group of not more than five members.

Computer Science -I

BCS-1 Computers Fundamentals and C Programming

Theory Examination- 50 Max marks.   Number of Teaching hours –48
Internal Assessment- 10 Max marks

Unit 1- Introduction to Computer Systems: 15hrs
Definition of a Computer, History of Computers,Generations of Computers, types of computer – based on size and working principle, Block diagram of a Computer with functional units(explanation), Parts of a computer system,Information processing Cycle.Definition of software and hardware,types of programming languages, assembler,compiler, interpreter, linker, loader (Definitions only),number system – decimal, binary,octal and hexadecimal number,interconversion of decimal to binary and vice-versa.ASCII codes. Algorithm-definition, Characteristics, notations. Flowchart-definition, Symbols used in writing the flow-chart Writing an algorithm and flow-chart of simple problems.

Unit 2- Introduction to Computer Systems: 06hrs
Introduction to C, featuresC , basic C program structure, character set, tokens, keywords andidentifiers. Constants, variables, data types, variable declaration, symbolic constant definition.

Unit 3- Operators and Expressions: 06hrs
C operators- arithmetic, relational, logical, bitwise, assignment, increment and decrement, conditional (?:) and special operators, Arithmetic expressions, precedence of operators andassociatively. Type conversions, mathematical functions.Definition of macro and pre-processor directives, Managing I/O operation – reading andwriting a character, formatted and unformatted/O functions.

Unit 4- Control Structures: 10hrs
conditional control statements- if, if-else,nestedif,switch , go to statement, while, do-while and for statements. Unconditional control statements- break, continue and return statements(definition and explanation with syntax, flowchart and examples)

Unit 5- Arrays, Strings and Functions: 10hrs
Definitions of an array, types-one and two dimensional array,(definition, declaration, initialization with examples).*Strings*–definition, declaration and initialization of string variable, string handling functions- strcmp,strcpy,strrev,strlen,strlwr,strupr(explanation with syntax and examples) Functions – definition, need, syntax for function declaration, function prototype, category of functions, nesting offunctions, function with arrays, scope of variables , parameter passing mechanism- call by value and call by reference. Recursion and Recursive function(definitions only)

Reference :
1. Fundamentals of Computers, V. Rajaraman.
2. Computer Concepts and C Programming, P.B. Kotur
3. Let us C ,YashwanthKanetkar
4. ANSI C, Balagurusamy

QUESTION PAPER PATTERN

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions each carrying 05 Marks. Each question may contain sub questions-(a) and (b), The student has to attend only 03 questions.

Question 1 from Unit 1.
Question 2 from Unit 2
Question 3 from Unit 3
Question 4 from Unit 4
Question 5 from Unit 5

PART- IV: 20 Marks

There shall be 03 questionsand each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1 & Unit 3.
Question 2 from Unit 4
Question 3 from Unit 5

PRACTICAL: C- PROGRAMMING LAB

1. Find the biggest of three numbers.
2. Arithmetic operations using switch statement.
3. Find the Fibonacci series between M and N.
4. Prime numbers between M and N
5. Binary to Decimal conversion
6. Sorting an unsorted array
7. Searching an element in an array.
8. Addition of two matrices
9. Multiplication of two matrices
10. Norm and trace of the matrix.
11. Count the numbers of vowels in a given string.
12. Find the factorial of a number using function.

PRACTICAL EXAM SCHEME
- Practical Proper - 30 Marks
  - ✓ Program Flowchart/Algorithm 05 Marks
  - ✓ Program Writing 15 Marks
  - ✓ Correct output with proper display 10 Marks
    (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

SECOND SEMESTER BSc

Computer Science -II

BCS-2 Data Structures using C

Number of Teachinghours – 48

Theory Examination- 50 Max marks.
Internal Assessment- 10 Max marks

Unit 1– Introduction to Data Structures, Structure and Union   08hrs
Pointers–Definition, Declaration, Examples and usage. Static / dynamic memory allocation. Structure–Definition, declaration, accessing structure members. Union – Definition, declaration, Differences between structures and union . Definition of Data Structure and types with examples.

Unit 2- Stack   6hrs
Definition and example, operations, representation of stack in C, applications of stack, evaluation of postfix expression, conversion from infix to postfix. Recursion –Tower of Hanoi, Factorial, GCD.

Unit 3- Queues and lists   10hrs
Definition and example, operations on queue, types of queue, sequential representation, disadvantages of ordinary queue, circular queue and priority queue(concepts only).Linked list–Definitions and types of lists ,operations on SLL, stack and queue implementation using linked list, circular anddoubly linked list (concepts only).

Unit 4- Trees   10hrs
Tree definition, representation, types of tree, Tree terminologies with an example, Binary tree,linked list representation of binary tree, tree traversals,binary search tree(definition only) and its applications.

Unit 5- Searching and sorting   10hrs
Searching   technique-   sequential, Binary search, interpolation,   binary tree searching definition of Sorting definition and its types –radix sort, quick sort, shell sort,heapsort,binary tree sort.

References:
1. Systematic approach to data structure Padmareddy
2. Programming in ANSI C - E. Balagursamy
3. Datastructures and programming design using C - Robert Kruse PIII publications
4. Datastructures and applications - Trembly and Sorenson

QUESTION PAPER PATTERN

PART- I: 05 Marks
There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks
There shall be 05 questions each carrying 02 Marks from all units

PART -III: 15 Marks
There shall be 05 questions each carrying 05 Marks.
Each question may contain sub-questions-(a) and (b),
The student has to attend only 03 questions.
Question 1 from Unit 1.
 Question 2 from Unit 2
 Question 3 from Unit 3
 Question 4 from Unit 4
 Question 5 from Unit 5

PART- IV:20 Marks
There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 2 & Unit 5.
 Question 2 from Unit 3
 Question 3 from Unit 4

PRACTICAL DATA STRUCUTRES LAB

1. Implementation of stack
2. Evaluation of postfix expression
3. Conversion of infix to postfix
4. Tower of Hanoi
5. Implementation of queue
6. Implementation of stack/queue using linked list
7. Binary tree traversals
8. Quick sort
9. Heap sort
10. Tree sort
11. Shell sort
12. Binary search

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
  - ✓ Program Writing 20 Marks
  - ✓ Correct output with proper display 10 Marks
    (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

Computer Science -III

BCS-3 Object Oriented Programming with C++
Number of teaching hours – 48

Theory Examination- 50 Max marks.
Internal Assessment- 10 Max marks

Unit 1: Introduction to C++ and OOPS: 12hrs
Object Oriented Programming paradigm, Basic concepts of Object Oriented Programming-Classes, Objects, Data Abstraction and Encapsulation, Polymorphism, Inheritance, Dynamic Binding, Message passing, Benefits of OOP, Object Oriented languages, applications of OOP.C++ features, Comparisonof C++ with C, Structure of a C++ program, input and output statements,Keywords, symbolic constants, type compatibility, declaration of variables, reference variables,operators in C++, control structures.

Unit 2 : Classes Objects and Member Functions: 15hrs
Limitations of structures in C, specifying a class, creating objects, memory allocation for objects,static data members, arrays within a class, local classes. Defining member functions, call byreference, return by reference, inline functions, default arguments, making an outside functioninline, nesting of member functions, private member functions, function overloading, static member functions, const member functions, pointer to members, friend and virtual functions.

Unit 3 : Constructors and Destructors: 06hrs
Introduction, constructors, parameterized constructors, multiple constructors in a class, constructors with default arguments, dynamic initialization of objects, copy constructor, dynamicconstructors, constructing two dimensional arrays, const objects, destructors.

Unit 4 : Operator overloading: 05hrs
Introduction, definition, overloading unary operators, overloading binary operators, overloadingoperators using friends, string manipulations using operators, rules for operator overloading, typeconversions.

Unit 5 : Inheritance and Templates: 10hrs
Inheritance definition, defining derived classes, types-single inheritance, making a private member inheritable,multilevel inheritance, multiple inheritance, hierarchical inheritance, hybrid inheritance, virtual base classes.Template definition, class templates, class templates with multiple parameters, function templates,function templates with parameters.

Reference Books:

1. Object Oriented Programming with C++ - E balaguruswamy
2. Object Oriented Programming in Turbo C++ - Robert Lafore
3. C++ The complete Language – BjarneSchildt

QUESTION PAPER PATTERN

PART- I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART- II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions each carrying 05 Marks.

Each question may contain sub-questions-(a) and (b),

The student has to attend only 03 questions.

Question 1 from Unit 1.

Question 2 from Unit 2

Question 3 from Unit 3

Question 4 from Unit 4

Question 5 from Unit 5

PART IV:20 Marks

There shall be 03 questions and each carrying 10 Marks.

The student has to attend only 02 questions.

(Each question should have at least two sub questions)

Question 1 from Unit 1 & Unit 2.

Question 2 from Unit 3 & Unit 4.

Question 3 from Unit 5

PRACTICAL: C++ LAB

1. Write a c++ program to find the result of a student using class concept
2. Define a class employee having data members name, basic salary, net salary with the member function getdata(), showdata(). Calculate the net salary assuming appropriate % for all allowance and deductions using class concept
3. Define a class to represent product details it includes data member pname, pcode, price, pquality include member function a) to get product detail   b) to display the product details and total price using class concept
4. Write a c++ program to print Fibonacci series using constructor
5. Write a c++ program to find biggest of two numbers and three numbers using function overloading
6. write a c++ program to calculate area of triangle, rectangle and circle using function overloading
7. write a c++ program to calculate family income using friend function
8. write a c++ program to add two complex numbers using operator overloading
9. write a c++ program to concatenate two string using operator overloading
10. write a c++ program to implement multiple inheritance by creating classes: Father , Mother and Son
11. write a c++ program to swap two numbers using function template
12. write a c++ program to sort an array using function template

PRACTICAL EXAM SCHEME
- Practical Proper - 30 Marks
  - ✓ Program Writing 20 Marks
  - ✓ Correct output with proper display 10 Marks
    (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

Computer Science -IV

BCS-4: Database Management System

Number of Teaching hours – 48

Theory Examination- 50 Max marks.

Internal Assessment- 10 Max marks

Unit 1: Introduction to DBMS   10hrs

Meaning of data and information. Meaning of persistent data, definitions for DBMS, database, database system, examples, database system applications. database management system vs. file management system, views of data, data independence, data models, database languages, database users and administrators, database system structure, application architecture, advantages of using DBMS, classification of DBMS, meaning of schema and instance.

Unit 2: E-R Model   10hrs

Using high-level, conceptual data models for database design, basic-concepts, constraints, keys, an example database application, E-R diagram, types of entities, entity sets, attributes, types of attributes, weak entity sets, cardinality ratios (mapping cardinality), specialization, generalization.

Unit 3: Relational Model   10hrs

Structure of relational Databases, Relational algebra - select, project. union, set difference, rename, division operations, Modification of the database, queries using relational algebra. Extended relational algebra operations.

Unit 4: SQL   10hrs

Background, basic structure, set operation, aggregate functions, NULL values, nested sub queries, Views, complex queries, Modification of the database, joined relations, Data Definition Language, domain constraints, referential integrity in SQLAssertions, authorization, privileges in SQL.

Unit 5: Relational Database Design: 08hrs

Pitfalls in relational data base design, Normalization for relational databases. Normal forms based on primary keys, General definitions of first, second and third normal forms, Functional Dependency (concept and example) decomposition, Boyce-Codd Normal Form -

definition and example, fourth Normal form - Multi valued Dependencies - definition and example.

Reference Books:

1. Korth, Sudarshan "Database System concepts", Mcgraw Hill-IV Edition.
2. Navathe, Silberchatz and Elmasri "fundamentals of database Systems"-Addison Wesley-2004
3. C.J. Date "Introduction to Database systems" Addison-wesley.
4. Bipin C Desai "Introduction to Data base system" Galgotia publications

QUESTION PAPER PATTERN

PART- I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART- II: 10 Marks
There shall be 05 questions each carrying 02 Marks from all units

PART -III: 15 Marks

There shall be 05 questions each carrying 05 Marks.
Each question may contain sub-questions-(a) and (b),
The student has to attend only 03 questions.
Question 1 from Unit 1.
 Question 2 from Unit 2
 Question 3 from Unit 3
 Question 4 from Unit 4
Question 5 from Unit 5

PART- IV:20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1.
 Question 2 from Unit 2 & Unit 3
 Question 3 from Unit 4 &Unit 5

PRACTICAL: SQL LAB

I. Use the default emp and depttables to write SQL statements for the following queries
    1. Find the employee details in ascending order of their name and descending order of their salary
    2. Find names of all employees whose name starts with 's' and having atleast 6 characters in it
    3. Find the name of all managers and number of employees under them
    4. Find the details of all employees in the research department
    5. Find the minimum, maximum and average salary of each department
    6. Find department name having least number of employees
    7. Find the department name having highest annual payroll
    8. Add an employee under the manager smith
    9. Find the employees who are not getting commission

II. Createtables as below
    Student(name string, regno string primary key, dob date, doj date ,course string foreign key)

    Markscard(regno foreign key, sem string, sub1 number, sub2 number, sub3 number, tot number, avge number, result string)

    Write SQL statements for the following queries.

    1. List the names of students studying in BCA course in the order of their joining
    2. Find the name of student who has scored highest marks in every sem of each course
    3. Count the number of students in each course
    4. Find the course having second highest number of students
    5. Find the course having least students in I semester
    6. Raise the marks of sub3 in III sem BCA students by 5% if the student has failed in that subject
    7. Display the details of student 'xxx' in every semester.
    8. Find the names of al juniors of 'yyy' in course 'c1'
    9. Find all students studying with 'xxx' and elder to him (compare DOB)

III. Dept(deptno integer pkey, dname string not null, loc string not null)
Emp(eno integer pkey, ename string, deptnofkey, desgn string not null, bsal number>0)

    Salary(enofkey,da,hra,gross,it,pf,net,comm)

    DESGN ARE manager,clerk,salesman

    Comm=5% of basic if desgn=salesman   otherwise null

    Da=15% bsalhra = 7% of bsal gross=bsal+da+hra

It =0 if gross<15000

    = 10% of gross if gross between 15000 and 30000

    =20% of gross if gross between 30000 and 50000

    = 30% of gross otherwise

  pf = 10% of gross or 1000 whichever is less

Write SQL statements for

1. Count the number of employees in every designation
2. List the employees of every department in descending order of their net salary
3. List the name and salary of highest salary payer in every department
4. List the name of employee paying highest IT
5. List the total IT paid by each department
6. List the departments in every location
7. Raise the basic salary by 10% for the managers of every department.
8. Find the number of employees having at least 10 years of experience in every department.
9. Count the number of employees who are not getting commission in every department

PRACTICAL EXAM SCHEME

Practical Proper - 30 Marks

Viva – voce - 05 Marks

Record - 05 Marks

Table Creation	Table creation & data insertion	10 marks
	4 SQL queries	
SQL queries	Queries writing 3 marks (each)	20 marks
	Execution 2 marks (each)	

(NOTE: Examiner has to ask 6 queries from a cycle in which student should answer 4 queries in the given cycle)

Computer Science -V

BCS-5 JAVA Programming

Number of teaching hours – 48

Theory Examination- 50 Max marks.
Internal Assessment- 10 Max marks

1. Introduction to Java and Java Program Structure   15hrs

History of Java, Java features, Difference between C/C++ and Java, Java program structure, Java tokens, Statements, JVM, Introduction to packages in Java, Applets, Operators & Expressions, Data types, Constants and Variables, Type conversions, Mathematical functions; Control Statements: Decision making and Branching with while, do-while, for and labeled loops; Arrays, Vectors & Strings: Initialization, Declaration of 1D, 2D arrays, String arrays, String methods, Vectors, Wrapper classes.

2.   Overview   10hrs

Class, Objects, Constructor, Method overloading, Static members; Inheritance: Single, Multilevel, Hierarchical, Visibility modes, Method overriding, Final variable, Abstract methods and classes; Interface: Defining, Extending and implementing assigning interface variables

3.   Packagesand multithreading   10hrs
Java API Packages, using system packages, naming convention, accessing and using a package, adding a class to packages, hiding classes. Multithreaded programming: Creating a thread, extending the thread class, stopping and blocking a thread, life cycle of a thread, using thread methods, thread exceptions, thread priority, synchronization, implementing the runnable interface.

4.   Exceptions and Debugging: 08hrs

Meaning of errors and exceptions, Dealing with errors, Classifications of exceptions, syntax of handling exceptions, advertising the exceptions, throwing and re-throwing exceptions, creating Exception classes, multiple catch statements, finally clause, tips for using exceptions, Debugging techniques – tricks for debugging, Assertions, Java Debugger (JDB).

5.   Applets and Graphics: 05hrs
Applets basics, applets and application, Life cycle, Life cycle of Applet programming- passing parameter to applets, paint and repaint methods, Graphics class, Line, Rectangle, Circle, Ellipse, Arcs and Polygon. Using control loops in applets, drawing bar charts.
Reference Books:

1. Java, The Complete Reference   –   Patrick Naughton and Schildt
2. Programming in Java   –   Joseph L Weber
3. Java Programming   –   E Balagurusamy

QUESTION PAPER PATTERN

PART- I: 05 Marks
There shall be 05 questions each carrying 01 Marks from all units

PART- II: 10 Marks
There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks
There shall be 05 questions each carrying 05 Marks.
Each question may contain sub-questions-(a) and (b),
The student has to attend only 03 questions.
Question 1 from Unit 1.
Question 2 from Unit 2
Question 3 from Unit 3
Question 4 from Unit 4
Question 5 from Unit 5

PART- IV:20 Marks
There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1 & Unit 2
Question 2 from Unit 3 & Unit 4
Question 3 from Unit 5

PRACTICAL: JAVA PROGRAMMING LAB

1. Write a Java program to generate first n odd numbers and pick and display prime numbers among them. Read value for n as command line argument.
2. Write a Java program to create a vector, add elements at the end, at specified location onto the vector and display the elements. Write an option driven program using switch…case.
3. Write a java program to find area of geometric figures (atleast 3) using method overloading.
4. Write a Java program to find the circumference and area of the circle using interface.
5. Write a java program to sort the alphabets in the given string.
6. Write a java program to accept student information using array of objects and constructor initialisation.
7. Write a java program to implement constructor overloading by passing different number of parameter of different types.
8. Define a package to contain the class sort to contain methods for various sorting techniques with time complexity (at least 2)Use this package to sort the list
9. Write a Java program to demonstrate multi-threading.
10. Write a program to implement an applet by passing parameter to HTML
11. Write an applet program to display human face
12. Create an applet to display concentric n circles, input value for n.

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
  - ✓ Program Writing 20 Marks
  - ✓ Correct output with proper display 10 Marks
    (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

FIFTH SEMESTER BSc

Computer Science -VI

BCS-6: Operating System and UNIX

Number of teaching hours – 48

Theory Examination- 50 Max marks.
Internal Assessment- 10 Max marks

Unit 1.Introduction to Operating systems, CPU Scheduling and Memory management
10hrs

Introduction, types and functions of operating systems. Scheduling concepts, algorithms, performance criteria, FCFS, Shortest job first, priority scheduling, Pre-emptive algorithm – round robin. Function, single contiguous allocation, multiprogramming, partitioned allocation. Paged memory management.

Unit 2.Dead lock and File system   05hrs

Deadlock problem, deadlock characteristics, deadlock prevention and avoidance.File concept access methods, directory structures, protection and consistency semantics

Unit 3.Introduction to UNIX, The File System   15hrs

The Unix operating system, A brief Session, The Unix Architecture, Features of UNIX, Locating commands, Internal and External commands. General-Purpose Utilities: man, cal, date, echo, printf, bc, script, passwd, who, uname. The file, The Parent –Child Relationship, The HOME Variable, pwd, cd, mkdir, rmdir, Absolute Pathname, Relative Pathname, ls, The Unix File system. Handling Ordinary Files: cat, cp, rm, mv, more, lp subsystem: Printing a File, File, wc, od, cmp, comm, diff, dos2unix and unix2dos, compressing and archiving files, gzip, and gunzip, tar, zip and unzip.

Unit 3: Basic File Attributes and Vi Editor   08hrs

Listing file attributes, File Ownership, File Permissions, changing file permissions, Changing File Ownership Vi basics, Input Mode, Saving Text and Quitting, Navigation, Editing Text, Undoing Last Editing Instructions(U and U), Repeating the last command(.), Searching for a Pattern(/ and ?), Substitution.

Unit 5:The Shell: 10hrs

Brief introduction, The shell's Interpretive Cycle, Shell variables. Essential shell programming: Shell scripts, read, using command line arguments, the logical operators && and ||- conditional execution, the if conditional, using test and [] to evaluate expressions, the case conditional, expr, while, for, set and shift, file test operator. Pattern matching :grep

Refernces :
1.Sumitabha Das, UNIX System V.4, Concepts and Applications, TMH
2.Operating systems concepts, Korth

QUESTION PAPER PATTERN

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions each carrying 05 Marks.
Each question may contain sub-questions-(a) and (b),
The student has to attend only 03 questions.
Question 1 from Unit 1.
 Question 2 from Unit 2
 Question 3 from Unit 3
 Question 4 from Unit 4
 Question 5 from Unit 5

PART- IV:20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1 & Unit 2
 Question 2 from Unit 3 & Unit 4
 Question 3 from Unit 5

PRACTICAL: UNIX PROGRAMMING LAB

1) Write a shell script program to perform all arithmetic operation on floating point.
2) Write a shell script program to check whether the given number is positive or negative.
3) Write a shell script program to reverse a number.
4) Write a shell script program to find sum of digit of a number.
5) To Find the sum of the series (sum= $1 + \frac{1}{2} + \ldots \ldots + 1/n$)
6) Write a shell script to perform the following any one operation based on your own choice.
   - a. Show first 5 line data
   - b. Show last 3 line data
   - c. Sort the data
   - d. Find out word count
7) Add, subtract and multiply the two given number passed as command line argument.
8) Write a shell script to count number of characters in a given string
9) Write a shell script program to read pattern and file name and search whether the given pattern in a file or not.
10) Write a shell script to read filename from command line argument check whether the file is regular file or directory or by both.
11) Find the number of directory file and ordinary files in the current
12) To read two file names and check which one is newer and which one is older.

PRACTICAL EXAM SCHEME
- Practical Proper - 30 Marks
   - ✓ Program Writing 20 Marks
   - ✓ Correct output with proper display 10 Marks
     (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

SIXTH SEMESTER BSc

Computer Science -VII

BCS-7 ADVANCED PROGRAMMING IN JAVA

Number of teaching hours – 48

Theory Examination- 50 Max marks.
Internal Assessment- 10 Max marks

Unit 1: Review of Java Concepts and AWT, Graphics Programming   10hrs

Review of Java Concepts .AWT and AWT Classes, Window fundamentals – Component, Container, Panel, Window, Frame, Canvas. Working with frame window. Graphics Programming: Graphics class, methods, drawing objects, line graphs, polygon classes, working with colours and fonts. Advanced graphics operations using Java2D.Designing simple User Interfaces (UIs) using AWT, Layout Manages.

Unit 2: Swings and event handling   10hrs

Event Handling: Basics of Event Handling, the delegation event model, AWT event hierarchy and event classes, Event Listener Interfaces, Adapter Classes, Event queue. Swing: Meaning, need difference between AWT and swing. The Model-View-Controller (MVC) design patterns, Creating simple UIs using swing, and handling basic events.

Unit 3: Java Beans, Java Archives (JAR)   08hrs

Meaning and need of Java Beans, Advantages, Bean writing process, Bean properties.Java Archives (JARs): Meaning, need, the JAR utility, Creating JAR files.

Unit 4: File Management and JDBC   10hrs

File, creating a file, writing to a file, opening a file, reading from a file, file management, checking existence of a file, deleting a file.JDBC: Meaning, need, concept and structure of JDBC, relation with ODBC, JDBC driver types and their meaning, the JDBC process – loading the driver, connecting to the DBMS, creating and executing SQL statement, Connection object, Statement object, Prepared Statement object, Callable Statement, Result Set, JDBC Exceptions.

Unit 5: Fundamental concepts of Collections, Generics and Network programming 10hrs

Collections: Meaning, need, Collection interfaces, Concrete Collections – Array List, Hash set, Map. Generics: Meaning, need, benefits, generics usage, basics of generic types, type parameter naming conventions, type wildcards, using type wildcards, generic methods, bound types, writing simple generic container, implementing the container, implementing the constructors, implementing generic methods. Network programming: Meaning of Client, Server, Socket, port. Creating a client socket, creating a server socket, writing simple server and client.

References:

1.Complete Reference – Java 2:Herbert Schildt, 5th / 7th Edition, Tata McGraw-Hill

2.Thinking in Java: Bruce Eckel

3. Core Java 2: Volume I – Fundamentals: Cay S. Horstmann, Gary Cornell, Pearson Education Asia.

4.Core Java 2: Volume II – Advanced Features: Cay S. Horstmann, Gary Cornell, Pearson Education Asia.

QUESTION PAPER PATTERN

PART I: 05 Marks
There shall be 05 questions each carrying 01 Marks from all units

PART II: 10 Marks
There shall be 05 questions each carrying 02 Marks from all units

PART III: 15 Marks
There shall be 05 questions each carrying 05 Marks.
Each question may contain sub-questions-(a) and (b),
The student has to attend only 03 questions.
Question 1 from Unit 1.
 Question 2 from Unit 2
 Question 3 from Unit 3
 Question 4 from Unit 4
 Question 5 from Unit 5

PART IV:20 Marks
There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1 and Unit 2.
 Question 2 from Unit 3 & Unit 4
 Question 3 from Unit 5

PRACTICAL: ADVANCED JAVA PROGRAMMING LAB

1. Write an applet to add, remove, select an item in a list
2. Write an applet to display selected geometric figure from a list.
3. Write a program to implement mouse events
4. Write a program to implement keyboard events
5. Write a Java program (console) to store the typed text to a file.
6. Write a Java program to display the content of a file.
7. Write a Java program with JDBC to store the details of a person on to an Oracle database table.
8. Write a Java program with JDBC to access and display the details of a person stored in an Oracle database table.
9. Write a Java program with JDBC to access and delete the details of a given person stored in an Oracle database table.
10. Write a Java GUI program to accept the details of an employee and store the same on to an Oracle database table.
11. Write a Java program to design a simple Client and Server components. Pass simple text (static) from client to the server and a receipt acknowledgement (static) back to the client.
12. Write a Java program to demonstrate the use of generics.

PRACTICAL EXAM SCHEME
- Practical Proper - 30 Marks
  - ✓ Program Writing 20 Marks
  - ✓ Correct output with proper display 10 Marks
    (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

SIXTH SEMESTER BSc

Computer Science -VIII
BCS-8 :SOFTWARE ENGINEERING & COMPUTER NETWORKS

Number of Teaching hours – 48

Theory Examination- 50 Max marks.
Internal Assessment- 10 Max marks

Unit 1. Introduction to Software Engineering and Software process   10hrs

Software, Software Engineering, phases in softwaredevelopment, role of management and Software metrics. Software process, process models- waterfall model, prototyping model, iterativeenhancement model and spiral model.

Unit 2. Software design   07hrs
Design objectives, design principles, module level concepts, structured designmethodology, introduction to detailed design,SRS.

Unit 3. Coding and Testing

Programming practices, top down&bottom upapproaches,structuredprogramming,programming style. Testing fundamentals, brief introduction to functional testing and structural testing.Difference between black box testing and white box testing.

Unit 4 Introduction to Computer networks Network Hardware   10hrs

Definition and goals of computer network. Types of Networks- Broadcast, point- to -point , LAN, WAN, MAN, network topologies, wireless network example, Internet and its applications. 10 hrs

Unit 5 Network Software, Reference models and Transmission Media   13hrs

Network Architecture, Design issues of network , connection oriented andconnectionless services. OSI / ISO model, TCP / IP model, Novelnetware,ARPANET. Transmission Media- magnetic media, twisted pair, coaxial cable, fibre optics cable

References:
1. An integrated approach to Software Engineering :PankajJalote.
2. Software Engineering a practitioners approach : Roger Pressman.
3. Computer networks : Andrew S Tanenbaum.

QUESTION PAPER PATTERN

PART- I: 05 Marks
There shall be 05 questions each carrying 01 Marks from all units

PART- II: 10 Marks
There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks
There shall be 05 questions each carrying 05 Marks.
Each question may contain sub-questions-(a) and (b),
The student has to attend only 03 questions.
Question 1 from Unit 1.
 Question 2 from Unit 2
 Question 3 from Unit 3
 Question 4 from Unit 4
 Question 5 from Unit 5

PART -IV:20 Marks
There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1 and Unit 2.
 Question 2 from Unit 3 & Unit 4
 Question 3 from Unit 5

PRACTICAL: PROJECT LAB

PROJECT LAB EXAM SCHEME

The objective of the project is to motivate them to work in emerging/latest technologies, help the students to develop ability, to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and research laboratories. The project is of 3 hours/week for one (semester VI) semester duration and a student is expected to do planning, analyzing, designing, coding and implementing the project. The initiation of project should be with the project proposal. The synopsis approval will be given by the project guides.
The Project work should be either an individual lone or a group of not more than five members.

The project proposal should include the following:
- Title
- Objectives
- Input and output
- Details of modules and process logic
- Limitations of the project
- Tools/platforms, Languages to be used
- Scope of future application

The examiner will evaluate the project work as follows:

- Project Report - 10 Marks
- Project Demo - 10 Marks
- Viva-Voce - 20 Marks