

## Bachelor in Computer Application (BCA)

Papers	Name of Papers	IA - UE
<b>SEMESTER-1</b>		
Paper-I	Introduction to Information Technology	20-80
Paper-II	Computer Mathematical Foundation	20-80
Paper-III	Communication & Soft Skills	20-80
Paper-IV	Practical (Practical Papers of the 1 <sup>st</sup> Semester)	100
<b>SEMESTER-2</b>		
Paper-V	Programming in C	20-80
Paper-VI	Operating systems	20-80
Paper-VII	Computer system Architecture	20-80
Paper-VIII	Practical (Practical. Papers of the 2 <sup>nd</sup> Semester)	100
<b>SEMESTER-3</b>		
Paper-IX	Programming in C++	20-80
Paper-X	Systems analysis and design	20-80
Paper-XI	Data structures	20-80
Paper-XII	Practical (Practical Papers of 3 <sup>rd</sup> Semester)	100
<b>SEMESTER-4</b>		
Paper-XIII	Data communication & computer networks	20-80
Paper-XIV	Relation data base management system	20-80
Paper-XV	Visual basic. Net	20-80
Paper-XVI	Practical (Practical Papers of the 4 <sup>th</sup> Semester)	100
<b>SEMESTER-5</b>		
Paper-XVII	Software Engineering	20-80
Paper-XVIII	Computer Graphics	20-80
Paper-XIX	Java programming	20-80
Paper-XX	Practical (Practical Paper of the 5 <sup>th</sup> Semester)	100
<b>SEMESTER-6</b>		
Paper-XXI	Artificial Intelligence (Elective-I) OR Robotics engineering (Elective-1)	20-80
Paper-XXII	Compiler (Elective-II) / or Advanced micro processors systems (Elective-II)	20-80
Paper-XXIII	Practical (Practical Paper of the 6 <sup>th</sup> Semester)	100
Paper-XXIV	Project report	100

IA = Internal Assignment

UE = University Examination

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## Bachelor in Computer Application (BCA)

### SEMESTER-1

#### PAPER-I

### INTRODUCTION TO INFORMATION TECHNOLOGY

#### Section-I

**Computer Fundamentals :** Block structure of a computer, characteristics of computers, generation of computers, classification of computers.

**Number System :** Data & information, input, output & storage unit, Bit, byte, binary, decimal, hexadecimal, and octal number systems, conversion from one system to the other,

**Binary Arithmetic :** Addition, subtraction and multiplication.

**Representation of Information :**

Integer and floating point representation, Complement schemes, Character codes (ASCII, EBCDIC, BCD, Excess-3, Grey).

#### Section-II

**Elements of a computer processing system :** Hardware – CPU storage devices and media, VDU, input output devices, data communication equipment. Software – system software, application software. programming languages: classification, machine code, assembly language, higher level language, and fourth generation languages.

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### **PAPER-III**

#### **COMMUNICATION & SOFT SKILLS**

Essentials of Grammar : Parts of Speech, Punctuation, Vocabulary Building, Phonetics.

Office Management : Types of Correspondence, Receipt and Dispatch of Mail, Filing Systems, Classification of Mail. Role & Function of Correspondence, MIS, Managing Computer.

Letter & Resume Writing : Types of Letters-Formal! Informal, Importance and Function, Drafting the Applications, Elements of Structure, Preparing the Resume, Do's & Don'ts of Resume, Helpful Hints.

Presentation Skills : Importance of Presentation Skills, Capturing Data, Voice & Picture integration, Guidelines to make Presentation Interesting, Body Language, Voice Modulation, Audience Awareness, Presentation Plan, Visual Aids, Forms of Layout, Styles of Presentation.

Interview : Types of interview, Preparing for the Interviews, Attending the Interview, Interview Process, Employers Expectations, General Etiquette, Dressing Sense, Postures & Gestures.

Group Discussion & Presentation : Definition, Process, Guidelines, Helpful Expressions, Evaluation (Note: Every student shall be given 15 minutes of presentation time & 45 minutes of discussion on his/ her presentation)

The student will be evaluated on the basis of :

- his/ her presentation style
- Feedback of Faculty & Students
- General Etiquette
- Proficiency in Letter Drafting I Interview Preparation

#### **Reference Books :**

1. "Business Correspondence & Report Writing" – R. C. Sharma & K. Mohan, TMH
2. "Business Communication" – Urmila Rai & S.M. Rai, Himalaya Publishing House
3. "Communication" – C.S.Rayudu, Himalaya Publishing House

### **PAPER-IV**

#### **PRACTICAL**

(Papers of 1<sup>st</sup> Semester)

#### **SEMESTER-2**

### **PAPER-V**

#### **PROGRAMMING IN C**

##### **Section-I**

**Problem Solving with Computers :** Algorithms, and Flowcharts. Data types, constants, variables, operators, data input and output, assignment statements, conditional statements. Iteration, arrays, string processing, defining function, types of functions, function prototype, passing parameters, recursion. Storage class specifies, pre-processor, header files and standard functions.



## Section-II

Pointers: Definition and uses of pointers, pointer arithmetic, pointers and array, pointer and functions, pointer to pointer. Structures, union, pointers to structures, user-defined data types, enumeration.

## Section-III

Data files: Opening, closing, creating, processing and unformatted data files. Introduction to Dynamic Memory Allocation. C-programming applications: Sorting (Bubble sort, Selection sort), Searching (Binary search, Linear search)

### Reference Books :

1. "Let Us 'C', - Y Kanetkar, BPB Publications
2. "Programming in ANSI C 3. 'C - E. Balaguruswamy, TMH
3. "Programming Language" - Richie & Kernighan, Pearson Education
4. Programming with ANSI C & Turbo C" C - A.N. Kamthane Pearson Education
5. "C" Complete Reference - Schildt

## PAPER-VI

### OPERATING SYSTEMS

#### Section-I

Introduction to operating system its need and operating system services : operating system classification single user, multi user, simple batch processing, Multiprogramming, Multitasking, parallel Systems, Distributed system, Real time

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system. **Process Management** : Process concept, process scheduling, threads, overview of Inter process communication, **CPU scheduling** : Basic concepts, Scheduling Criteria, Scheduling algorithms.

## Section-II

**Memory management** : Logical versus Physical address space, Swapping, Partition, Paging and segmentation. **Virtual memory** : Demand paging, Page replacement algorithms, Allocation algorithms, Thrashing. **File Management** : File concept, access methods, and Directory structure-single level, two level, tree structures, acrylic graph and general graph directory, file protection. **Allocation methods** : Contiguous, linked and index allocation, free space management.

## Section-III

**Device management** : Disk structure, disk scheduling, FCFS scheduling, SSTF scheduling, SCAN scheduling, C-SCAN scheduling, Selecting Disk Scheduling Algorithms. **Deadlock** : Deadlock characteristics, Prevention, Avoidance, Detection and Recovery, critical section, synchronization hardware, semaphores, combined approach. to deadlock handling, **Resource Management** : Mechanism and Policy, domain of protection, access matrix. **Security** : Authentication. Program threats. System Threats, and Encryption.

### Reference Books :

1. "Operating System Principles" - A. Silberschatz, P. Galvin & G. Gagne, Wiley India
2. "Operating System" - A.S. Tannenbaum, Pearson Education
3. "Operating System" - W. Stallings, Pearson Education
4. "Operating Systems" - A.S. godbole, TMH

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### PAPER-III

#### COMPUTER SYSTEM ARCHITECTURE

##### Section-I

Logic gates, flip flop, Registers, Counters, Adder, Subtractor, MUX and DEMUX, encoder –Decoder **Computer organization and design** : Instruction codes, op-code, computer registers, computer instructions, Timing and control, instruction cycle, memory reference instructions. CPU: Stack organization, Instruction formats and addressing modes Program control, Types of Interrupts.

##### Section-II

Control Memory, Micro programming vs Hardwired control unit, Overview of RISC/ISC, I/O and their brief description, I/O, processing, Bug interface, data transfer techniques, I/O interrupts, channels.

##### Section-III

Memory system storage technologies, Memory hierarchy, Memory management, Main and Auxiliary memory, Associative, Virtual and cache memory.

##### Reference Books :

1. "Computer System Architecture" – M. M. Mano, (PHI) Pearson Education.
2. "Computer Architecture & Organisation" – J.P. Hayes, McGraw-Hill International Education
3. "Structured Computer Organisation" – A.S. Tannenbaum, (PHI) Pearson Education.
4. "Computer Organisation & Architecture" – W. Stalling, (PHI) Pearson Education

### PAPER-IV

#### PRACTICAL

(Papers of 2<sup>nd</sup> Semester)

#### SEMESTER-3

### PAPER-IX

#### PROGRAMMING IN C++

##### Section-I

Evolution of OOP, OOP Paradigm, advantages of OOP, Comparison between functional programming and OOP Approach, characteristics of object oriented language – objects, classes, inheritance, reusability, user defined data types polymorphism, overloading. **Introduction to C++**, Identifier and keywords, constants, C++ operators, type conversion, Variable declaration, statements expressions, features of iostream.h and iomanip.h, input and output, conditional expression, loop statements, breaking control statement.

##### Section-II

Defining function, types of functions, storage class specifiers, recursion, pre-processor, header files and standard functions', Arrays, pointer arithmetic's structures, pointers and structures, union, bit fields typed enumerations. Classes, member functions, objects, arrays of class objects, pointers and classes, nested



classed, constructors, destructors, inline member functions, static class member, friend functions, dynamic memory allocation.

### Section-III

Inheritance, single inheritance, types of bases classes, types of derivations, multiple inheritance, container classes, member access control Friend function Function overloading, operator overloading, polymorphism, early binding, polymorphism with pointers, virtual functions, late binding, pure virtual functions, opening and closing of files, stream state member functions, binary file operations, structures and file operations, classes and file operations, random access file processing.

#### Reference Books :

1. "Programming in C++" – D. Ravichandran, TMH
2. "Objected Oriented Programming with C++" – E. Balguraswamy, TMH
3. "The C++ Programme language" – Bjarne Stroustrup Addison-Wesley Publication Co. (Pearson Education)
4. "Object Oriented Programming in Turbo C++" – Robert Lafore, Galgotia Publications
5. "Programming in C++" – Dewhurst & Stark
6. "Mastering C++" – Venugopal, Ravishankar, Rajkumar
7. Object oriented Programming with ANSI C++ & TurboC C++ –A.N. Kamthane –Pearson Education.

## PAPER-X

### SYSTEMS ANALYSIS AND DESIGN

#### Section-I

**System :** Definition, Characteristics, elements and types of system Development Life Cycle, Role of systems analyst, initial investigation, Feasibility study-Technical, economic and behavioral feasibility, cost and Benefit analysis.

#### Section-II

**Systems Analysis :** Problem Definition requirements, gathering tools, Tools of structured Analysis – Data Flow Diagrams, Data Dictionary, Decision Tree, Decision tables and structured English. System Design: Structured Design, Input, and Output design, From Design. File Organization: Sequential Indexed Sequential, Chaining and inverted list organization.

#### Section-III

**System Testing :** Test Plan and data, types of system test. System implementation: Implementation Plan, activity network for conversion, combating resistance to change. Hardware/ Software Selection: Procedure for selection, Major phases in selection, Make v/s buy decision, criteria for software selection.

#### Reference Books :

1. "System Analysis & Design Methods" –Whiten, Bestley & Barlow, Galgotia Publication;s
2. "System Analysis & Design" –Award M. Elias
3. "Introductory System Analysis & Design:" –Lee
4. "An Integrated Approach To Software Engineering" –P. Jalota, Narosa Publishing House
5. "System Analysis & Design" –Sen, A. James



## **PAPER-XI**

### **DATA STRUCTURES**

#### **Section-I**

Basic concepts and notations data structures and data structure operations, mathematical notation and functions, algorithmic complexity and time space trade off. Basic data structures such as arrays, stack and queues and their applications, linked and sequential representation, Linked list, representation of linked list, multi linked structures.

#### **Section-II**

Trees-definitions and basic concepts, linked tree representation, representations in contiguous storage, binary trees binary tree traversal, searching insertion and deletion in binary trees, heap tree and heap sort algorithm, AVL trees.

#### **Section-III**

Graphs and their application, sequential and linked representation of graph - adjacency matrix, operations on graph, traversing graph, Dijkstra's algorithm for shortest distance, DFS and BFS, Hashing Searching and sorting - use of various data structures for searching and sorting, Linear and Binary search, insertion sort, Selection sort, Merge sort, Radix Bubble sort, Quick sort Heap Sort.

#### **Reference Books :**

1. "Data Structures Using C" -A. Tanenbaum, Y. Langhasam & A.J. Augestein, (PHI) Pearson Education
2. "Theory & Practices of Data Structures" -Seymour Lipschultz, McGraw-Hill

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3. "Data Structures", - E. Horowitz & S. Sahni, Galgotia Publications

4. "Data Structures Using C" - B. Balaia, Dhanpat Rai Publications

5. "Data Structures & Algorithms" -Aho, Pearson Educations

## **PAPER-XII**

### **PRACTICAL**

(Papers of 3<sup>rd</sup> Semester)

## **PAPER-XIII**

### **DATA COMMUNICATION & COMPUTER NETWORKS**

#### **Section-I**

Introduction to data communication, analog Vs Digital Communication, Fourier Analysis, Band Width limitation, data rate of a channel, Error detection and correction; nature of errors, parity check, CRC, hamming code, Modulation; Multiplexing : SDM, TOM STDM. Introduction of computer networks and application; network hardware, network software. Bit and Baud rate.

#### **Section-II**

OSI reference model, TCP/IP Reference model, network standardization, physical layer : circuit switching, packet

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switching, message switching, terminal handling, telephone system, modems, connections, transmission media. **Data link layer**: design issues, elementary data link protocols-sliding window protocol, HDLC/SDLC, ALOHA, CSMA/CD, token passing, IEEE standard 802 LAN and WAN.

### Section-III

**Network layer**: design, **Routing algorithms**: shortest path routing, flooding, distance vector routing, flow based routing, **Congestion control algorithms**: bucket, token bucket, internet working, the network layer in the Internet IP protocol, IP address & Class, IPUY, IPVB **Transport layer**: design, elements of transport protocol, addressing establishing & releasing a connection, flow control & buffering, TCP/IP service model, TCP connection management.

### Reference Books :

1. "Data Computer Communication" -Maxawell William Stalling, Macmillan International edition.
2. "Data Communication & Networking" -A. Forouzan, TMH
3. "Computer Networkins" -A.S. TarenbaumAcndrew, (PHI) Pearson Education)
4. "Computer Networks" Kundu. PHI
5. "Computer Networks" -Rowe - (PHI) Pearson Education

## PAPER-XIV

### Relation Date Base Management System

#### Section-I

Overview of DBMS, Basic DBMS terminology, data independence, Architecture of a DBMS, Distributed databases, structure of distributed databases, design of distributed databases. **Introduction to data models**: object entity relationship model, **hierarchical model**: from network to hierarchical, relational model, object oriented database, object relational database, comparison of OOD & ORR, comparison of network, hierarchical and relational models.

#### Section-II

Relational model: storage organizations for relations, relational algebra, relational calculus, functional dependencies, multivalued dependencies, and normalization. (Upto 3nf)

#### Section-III

Relational query language: SQL, database integrity, security, concurrency, recovery, client/server architecture, and technical introduction to oracle.

### Reference Books:

1. "An Introduction to Data Base systems" -C.J. Date, Narosa Publishers. (Pearson Education)
2. "Database system concepts" -Henry F. Korh, McGraw Hill
3. "Data Base Management system" -Elmasr and Navathe
4. "Data Base Management" -Leon & Leon



## PAPER-XV

### VISUAL BASIC.NET

#### Section-I

**INTRODUCTION TO NET :** Introduction to NET, The origin of NET; The Net Framework: Key design goal; common language runtime; Simpler Faster development; Tool Support; Scalability; metadata; Namespaces; Deployment and Execution; **NET FRAMEWORK BASE CLASSES :** Inside the NET Class Framework; System Namespaces; the System Types; System object class; system Exception Class; System. Console Applications; Program interfaces Web services., XML as NET "meta language" **INTRODUCTION TO CLR :** Common Runtime and Type System; The Anatomy of NET Applications: Assembly; Module; Type; Common type System; Custom types, **introduction to Visual Basic NET :** Visual Basic NET Defined; Visual Basic NET as a programming language; VB NET as a object oriented programming language.

#### Section-II

**Understanding the development Environment :** The NET Framework; The Visual Studio Start Page; Creating and Opening Project; Understanding Solutions; Visual Studio Network area; Understanding Window Behaviour; Designing Visual Components; Using the task list; Customising the IDE.

**Event procedures" properties and controls :** Event Procedure-Using the IDE to create an Eventprocedure; Writing code inside the Event Procedure; Viewing and changing properties; Adding controls to the form; The Toolbox; Changing the size, location using From Designer **Visual Basic Programming**

**Fundamentals :** Declaring and naming variables; Naming conventions; Changes to the Dim statement Arithmetic Operators: Division operators; Operator precedence; Comparison and Logical operators; Assignment Operator; The Location of the Assignment Statement; The Left.

#### Section-III

**Controlling the flow of your program :** Understanding the if statements; Using multiple Commands with an if Block; Working with false condition; Working Multiple if statements; Using Boolean logic in if condition; Using Select case; **Working with loops;** for loops: Do loops; **Arrays :** Declaring an array; Useful array functions; Resizing an array; **Managing program tasks with procedures :** Types of procedures; Working with sub procedure; Executing a procedure; passing data to a procedure with arguments; Working with function procedures; Understanding scope and Accessibility; **User interface :** Message boxes; Dialog boxes; Menus and Toolbars; creating menu; context Menu; Adding Toolbars and buttons; Defining and icon for a toolbar button; Adding Functionality to the Toolbar; Error Handling; System Exception Handling and debugging; Structured Exception Handling; The try ... Catch ... Finally statement.

#### Reference Books:

1. "Visual Basic NET" -Chavan, Pearson Education
2. "VB. NET Programming Black Book" -S.Holzner, Dreamtech
3. "Mastering VB. NET" -E. Petroustos, BPB Bublication.
4. "Introduction To. NET Framework -Wrox Publication.



## **PAPER-XVI**

### **PRACTICAL**

(Papers of 4<sup>th</sup> Semester)

## **SEMESTER-5**

## **PAPER-XVII**

### **SOFTWARE ENGINEERING**

#### **Section-I**

**Software :** Characteristics, Components, Applications, Software Process, S/W Process Models : Waterfall, Spiral, Prototyping, Fourth Generation Techniques, concepts of Project Management, Role of Metrics and Measurement, S/W Project Planning : Objective, Decomposition Techniques : SIW Sizing, Problem Based Estimation, Process Based Estimation, Cost Estimation Models: COCOMO Model. The SIW Equation.

#### **Section-II**

**System Analysis :** Principles of Structured Analysis, Requirement, Analysis, characteristics and components of SRS, DFD, Entity Relationship Diagram, Data Dictionary. S/W Design : Objectives, Principles, Concepts, Design Mythologies : Data Design, Architecture Design, Procedural Design, Object - Oriented Concepts.

#### **Section-III**

**Testing Fundamentals :** Objectives, Principles, Testability, Test Cases : White Box & Black box Testing, Testing Strategies : Verification & Validation, Unit Testing, Integration Testing, Validation Testing, System Testing.

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#### **Reference Books :**

1. "Software Engineering concept" -R.E.Fairly, McGraw -Hill
2. "An integrated approach to software Engineering" -P. Jalota Narosa Publishing House.
3. "System Analysis & Design Methods" -Whitten, Bestley & Barlaw; Galgotia Publications
4. "Software Engineering -A Practitioners Approach" -Roger S. Pressman McGraw -Hill
5. "Software Engineering" -Sommerville Pearson Education.

## **PAPER-XVIII**

### **COMPUTER GRAPHICS**

#### **Section-I**

**Graphics Hardware :** The Functional Characteristics of the systems are Emphasized, **Input Device :** Keyboard, Touch Panel, Light Pens, Graphic Tablets, Joysticks, Trackball, Data Glove, Digitizer, Image, Scanner, Mouse, Voice systems. **Hard copy devices :** Impact & Non-Impact Printers, Line Printer, Dot Matrix Printer, laser, Ink-Jet Printer, Electrostatic, Flatbed & Drum Plotters. **Video Display Devices :** Refresh cathode-Ray tube, Raster scan displays, color CRTDRT- monitor, Direct view storage tube, Flat panel displays 3-D Viewing Devices, Virtual Reality, Raster Scan Systems, Random Scan Systems, Graphic Monitors and Workstation.

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## Section-II .

Scan conversion Algorithm for Line, Circle and Ellipse, Bresenham's Algorithm, Area Filling Techniques, Character Generation. **2-Dimensional Graphics:** Cartesian and Homogenous Co-Ordinate Systems, Geometrical Transformation (Translation, Scaling, Rotation, Reflection, Shearing), Two Dimensional Viewing Transformation And Clipping (Line, Polygon and Text)

## Section-III

**3-Dimensional Graphics:** Geometrical Transformation (Translation, Scaling, Rotation, Reflection, Shearing), Hidden Line & Surface Removal Algorithms, Z-Buffer, Scan-Line, **Sub Division, Shading: Modeling Light Intensities:** Diffuse Reflection, Refracted Light, Half toning. **Surface Shading / Rendering Methods:** Constant intensity Method, Gouraud Shading, Phong Shading.

### Reference Books :

1. "Computer Graphics" – D. Hearn & M.P. Baker, (PHI) Pearson Education
2. "Introduction to computer Graphics" – J.D. Foley A.V. Dam, S.K. feiner. J.F. Hug.es, R.L. Phillips, Addison-Wesley publication company (Pearson education)

## PAPER-XIX

### JAVA-PROGRAMMING

#### Section-I

#### FUNDAMENTALS OF OBJECT-ORIENTED PROGRAMMING

Introduction; Object-Oriented Paradigm; Basic Concepts of Object-Oriented Programming, Objects and Classes, Data abstraction and encapsulation, Inheritance, Polymorphism etc.

**JAVA EVOLUTION:** Java History; Java Features (Compiled and interpreted, Platform-independent and portables, Object-oriented, Robust and secure, Distributed Simple, small and familiar, Multithreaded and interactive, High performance, Dynamic and extensible); How Java Differs from C and C++ (Java and C, Java and C++); Java and internet, Java and World Wide Web, Web Browsers Support systems, Java environment (Java development kit, Java standard library). **JAVA CLASSES :** Types of Classes, Scope rules, Access modifiers, Instantiating Objection of a Class, Calling methods, Packages & Interfaces, The String class, Java control statements, Operators, Arrays & Vectors.

#### Section-II

**Programming in Java :** Java Application, Applets & Servlets  
**JAVAAPPLETS :** Life Cycle of Applet, Creating Applets, Adding Applets to HTML File; Running the Applet basic Containers, Buttons, User Interface Components (Buttons, Text Fields, Text Areas, Check Boxes, Radio; Buttons, J-applet etc.) Layouts & Layout Managers, Using Dialogs, J-option Pane class, Input Dialogs Boxes, Timers & Sliders, Progress Bars, Tables. **EVENT HANDLING :** Event delegation Approach, Action Listener, Adjustment Listener, Mouse Listener and Mouse Motion Listener, Window Listener, Key Listener, change Listener, Caret Listener.



**MANAGING ERRORS AND EXCEPTIONS:**–Introduction; Types of Errors (Compile–time error, Runtime error); Exceptions; Syntax of Exception Handling Code; Multiple Catch Statements; Using finally Statement; Creating User defined Exceptions **JAVA I/O HANDLING :** I/O file handling (Input Stream, File Input Stream, File Output Stream, Data I/P and O/P Stream, Buffered I/P and O/P Stream, file Class, Reader and Writer Streams, RandomAccess File).

### Section–III

**Multithreading :** Overview of Multithreading, The Thread Control Methods, Thread life cycle, Newly created threads, Main thread Creating a Thread (Implementing Runnable Interface, Extending the Thread Class), Thread Synchronization, Writing Applets with Threads.

**SOCKET PROGRAMMING :** Introduction, TCPIP Protocol, UDP Protocol, Ports, Using TCP/IP Sockets, Using UDP Sockets.

**JAVA DATA BASE CONNECTIVITY (JDBC) :** JDBC ODBC bridge, Driver Manager Class, Java SQL Package (Connection Interface, Statement Interface, Prepared Statement Interface, Result Set Interface, Result Set Meta Data Interface) SQL Exception class.

### Reference Books :

1. "The Complete Reference Java 2" – Patrick Naughton & Herbert Schildt TMh
2. "Programming with Java" –E. Bataguraswamy, TMH
3. "Programming with Java" –Bhare, Pearson Education.
4. "Core Java (Vol.–I & Vol.–II)" –Horstman, Pearson Education
5. "Peter Norton Guide To Java Programming" Peter Norton, Techmedia Publication.

## PAPER–XX

### PRACTICAL

(Papers of 5<sup>th</sup> Semester)

## SEMESTER–6

## PAPER–XXI

### ARTIFICIAL INTELLIGENCE (ELECTIVE–I)

#### Sections–I

**Introduction to AI :** Definitions, Basic Elements of AI, AI application Areas, Introductory Concepts of AI Language PROLOG: Operators, Data Structures, Input & Output, Controlling Program Flow, Strings, and Recursion.

#### Section–II

**Knowledge Based Systems :** Knowledge representation, acquisition, organization & Manipulation, Basic Components & architecture of Expert systems, ES–Shells, Dealing with uncertainty.

#### Sections–III

**Natural language processing :** syntactic processing, semantic analysis, Morphological, discourse and pragmatic processing.



#### Reference Books:

1. "Artificial Intelligence" – E. Rich, K. Knight, TMH
2. "Introduction to Artificial Intelligence" –E. Charniak & D. McDermott Addison – Wesley Publishing company (Pearson Education)
3. "Introduction to Artificial Intelligence. & Expert systems" Dan. W. Patterson: PHI
4. "Principles of Artificial Intelligence" –Nils J. Nilson, Narosa Publishing Co.
5. "Artificial Intelligence" –Luger, Pearson Education

OR

#### ROBOTICS ENGINEERING (ELECTIVE-1)

##### Section-I

Introduction to robotics, Manipulators & Mobile Robots Classification of Robots Applications. Industrial application environment and work cells. Feeders and oriented Device Robot Anatomy. Robot and effectors, Transmission and actuators, with special reference to servomotors.

##### Section-II

Robot arm kinematics, World, Tool and Joint coordinates, DH transformation and inverse Kinematics. Fundamentals of Closed loop control, PWM amplifiers, PID control and Robotics sensors: Range, Proximity, Touch, Force and Torque Sensing, uses of sensors in Robotics, Machine Vision: introduction to machine Vision, The sensing and digitizing function in Machine Vision, image processing and analysis, Training and vision system, robotic Application, Low and High level vision.

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##### Section-III

Robot programming and languages and environment: Different methods, features of various programming methods, study, Robot Task planning: concept, deferent methods, robot learning, Mobile Robot: Introduction, obstacle Representatives, Motion Planning in fixed, Changing structured.

#### Reference Books :

1. "Robotics Engineering" –Fu, TMH

#### PAPER-XXII

##### PAPER-XXII

#### COMPILER (ELECTIVE-II)

##### Section-I

The Structure of a compiler, Phase of a Compiler, Compiler Tools, Finite Automata, Regular Expressions, conversion From Regular Expression To Finite Automata.

##### Section-II

Syntax Analysis, Context Free Grammars, Top Down & Bottom Up Parsing Techniques. Construction of LR, SLR&LALR Parsers. Syntax Directed Translation & Their implementation, Intermediate Code, Postfix Translation , Phase Trees, Syntax Trees.

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### Section-III

Run Time Environment Storage Organization, Storage Allocation Strategies, Parameter Passing, Symbol Tables, Code Generation, Problem in Code Generation, A Simple Code Generation & Code Optimization: Principle Sources, Loop Optimization, DAG Representation.

#### Reference Books :

1. Compilers-Principles, Techniques & Tools"-A.V. Aho, M.S. Lam, R.Sethi, J. D.Ullman, Pearson Education.
2. "Concepts of Compiler Design" -A.K. Pandey, S.K. Kataria & Sons.
3. "The Essence of compilers"- Hunter, Pearson Education.

OR

### ADVANCED MICRO PROCESSORS SYSTEMS (ELECTIVE-II)

#### Section-I

##### 8086/8088 Hardware specifications

Introduction; Pin out and Pin functions; Clock Generator (8284); Bus buffering and Latching; Bus timing; READY and Wait State; Minimum mode vs Maximum Mode;

##### Memory Interface

Memory Devices; Address Decoding; 8086;80188(8-Bit) Memory Interface; 8086; 80816; 802086; 80386 × (16-bit) interface;80486 (32-bit) Memory interface; Pentium and Pentium Pro Memory Interface; Dynamic Ram

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### Section - II

#### Basic I/O Interface

Introduction to I/O Interface; port address decoding; Programmable peripheral interface; Programmable Keyboard; Programmable Communication Interface; ADC and DAC Converters, Interrupts Basic Interrupt Processing; Hardware interrupts; Expending Interrupt Structure; Programmable Interrupt Controller; Direct Memory Access Basic DMA Operations; The 8237 DMA controller; Shared Bus Operations; Disk Memory Systems; Video Display;

#### Section-III

The 80186',80188,80286 Microprocessors 80186/ 80188 Architecture; Enhancements; Introduction to 80286 The 80386 and 80486 Microprocessors Introduction to 80386 Microprocessors; special 803.86 Registers; 80386 Memory Management; Moving to protected Mode; Virtual Mode; Memory Paging Mechanism; Introduction to 80486 Microprocessors; The Pentium and Pentium Pro Micro Processors Introduction to Pentium Micro Processors; Special Pentium Registers; Pentium Memory Management; New Pentium Instructions; Introduction to Pentium Pro Microprocessors; Special Pentium Pro Features.

#### Reference Books :

1. Advanced Microprocessor & Peripherals"-A.K. Ray & K.M Bhurchandi, TMH
2. "Microprocessor" - B. Ram,' Dhanpat Rai Publication
3. Microprocessor" - Goankar, Pen a Ram Publication
4. "Micro Processor" -Ayla, Thomson Press
5. "The Intel Microprocessors" - Brey - 6/e Pearson Education.

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## PAPER-XXIII

### PRACTICAL

(Papers of 6<sup>th</sup> Semester)

## PAPER-XXIV

### PROJECT REPORT