

OMKARA COLLEGE OF PROFESSIONAL EDUCATION

(A CONSTITUENT UNIT OF PATLIPUTRA UNIVERSITY, PATNA)

BCA 1st Year (Bachelor Of Computer Applications)

Paper I: Computer Fundamentals

Honours Papers

Group-1: Computer Fundamentals

- Introduction To Computers: What Is Computer? Comparison Between Computer And Human Brain, Characteristics Of Computer, Computer Applications.
- History Of Computers: Initial Development, Generation Of Computer, Evolution Of Personal Computer.
- Computer Organization: Basic Units Of Computer, Block Diagram Of Computer, Input Unit, Processing Unit, Output Unit, Storage Unit.
- Types Of Printers: Hard Copy Output, Impact Printers, Non-Impact Printers, Serial And Line Printers, Dot-Matrix Printers, Laser Printers, Daisy Wheel Printers, Drum And Chain Printers, Thermal Printers.
- External Storage Devices: SASD, DASD, Punch Cards, Magnetic Tapes, Blocking Utilization Factor, Magnetic Disk, Tracks, Sectors, Seek Time, Rotational Latency, Access Time, Numerical Problems.
- Types Of Computers: Digital, Analog, Hybrid Computers, General Purpose Computers, Turnkey Systems, Micro Computers, Mini Computers, Mainframes, Super Computers.
- Data Representation: Number Systems, Binary System, Binary To Decimal And Decimal To Binary Conversion. Binary Addition, 2's Compliment Representation, Binary Subtraction, ASCII And EBCDIC Coding.
- Computer Software: Machine Language, Assembly Language, High Level Languages, Compilers, Interpreters, Assemblers. Centralized Processing, Decentralized Processing, Distributed Processing, Management Information System.
- Processing Modes: Uniprocessor, Multiprocessor, Batch Processing, Off Line Data Entry, On-Line Processing, On-Line Data Entry, Real Time Processing, Time Sharing Processing, Electronic Mail, Tele Text, Tele Conferencing.
- Programming Concepts: Programme Definition, Characteristics Of Good Programme, Programming Steps, Algorithms, Flowcharts.

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Paper I: Computer Fundamentals

Honours Papers

Group-2: Introduction To Computer Architecture

- Introduction To Microprocessors And Associated Components, Timer, Display Controllers, DMA Controllers.
- Block Diagram Of IBM PC. Evolution Of Microprocessor. Family Of Intel Microprocessor, Introduction To 8086 & 8088 Architecture.
- Functional Description Of Various Modules & Cards. CISC & RISC Technology. Various Types Of Displays And Other Peripherals Used In IBM PCs.
- Boot Process In IBM PC. System Files. Self Text.
- Disk Operating System–Information, File Management. Directory Structure In DOS. Internal And External Commands Of DOS.
- Batch Files, Configuration Files. System Files, COM, BIN, SYS, EXE & TXT Files.

Group-3: Programming Logic And Design Techniques

- Programme Development, Low-Level Programming Language, High-Level Languages, Programming Aids, Programming Techniques, Programming Tools, Program Maintenance.
- Techniques Of Programming (Algorithm, Flowchart, Pseudo Codes). Introduction To Programming In QBASIC Structured Programming–Introduction. Need Of Structure Programming Development Of Programme In QBASIC.

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Paper I: Computer Fundamentals

Honours Papers

Group-4: Practical

- Visit To Computer Lab: Introduction To Various Components Of A Computer. A Simple Documentation Preparation And Printing. Usage Of Printer And Other Components.
- Use Of External And Internal DOS Commands. Programming In QBASIC.
- Physical Inspection Of IBM PC And Internal Cards. Introduction To Nomenclature (COM1, COM2, Etc). Writing Batch Files For Various Purposes. Modify Config.Sys Files. Creating Using QBASIC Programmes.

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Paper II: Operating Systems & Business Applications

Honours Papers

Group-1: Operating Systems

- Introduction To Various Categories Of Software. Operating System And Its Function Interaction Of Operating System With Hardware And User Programme.
- Various Components Of Operating System With Reference To DOS, BIOS, BIOS And DOS Interrupts.
- Single User Operating System, Task Loader, Memory Management.
- Device Management. Control Of Various Devices. Device Drivers Interrupts Driven And Pool Driven Data Transfers. Need Of Software And Hardware Protocols.
- Multi-User, Multi Tasking, Multi Processing And Real Time Operating System. Introduction To Memory Management Scheduling.
- File Systems, File Management. Process Management And Scheduling.
- Special Requirements And Facilities For Multiprocessing Environment.
- Examples Of Multiprocessing Operating Systems. Introduction To UNIX. User Management In UNIX.
- Computers In Office Automation: Nature And Uses Of Information, Formal And Informal Information And Communication, Gathering And Presenting Information.
- System Life Cycle, Documentation, Testing, Debugging, Implementation.

Group-2: Business Applications

- Database Organization, Database Files, Records, Fields, Types Of Files In Database.
- File Organization: Sequential File, Random File, Indexed File, Windows 98/2000, MS-Office.

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Paper II: Operating Systems & Business Applications

Honours Papers

Group-3: Programming With FoxPro

- FoxPro: Viewing And Editing Data
- FoxPro: Indexing, Sorting And Printing Report
- FoxPro: Memory Variables, Keyboard Macros And Function
- Programming And Error Debugging
- Multiple Data File And Custom Screens
- Text & References: FoxPro Made Simple By R.K. Taxali, BPB; Mastering FoxPro 2.5 BPB Publication

Group-4: Practical

- Development Of Batch Files To Install Software From Floppy To Disk.
Development Of Batch Files To Manage Various Packages On The Disk.
Detection Of Viruses And Protection Packages On IBM PC. MS-OFFICE, WINDOWS 98/2000.

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Paper III: Computer Networking & Programming

Honours Papers

Computer Networking

Introduction To The N/W, Network Topologies, Types Of Channels: Twisted Wire, Co-Axial Wire, Microwave Communication, Satellite Communication, Optical Fiber, Simplex, Duplex, Half Duplex Communication, Switching Techniques: Circuit Switching, Message Switching, Packet Switching, FEP, Repeaters, Bridge, Gateway, Token Passing CS/CD, Protocols, ISO-OSI Model, NIC, Serial And Parallel Communications.

Internet

Evolution, Protocols, Interface Concept, Internet Vs Intranet, Growth Of Internet, ISP, Connectivity-Dial-Up, Leased Line, VSAT, Etc URLs, Domain Names, Portals, Application. E-Mail Concept, POP And Web Based E-Mail, Address, Basics Of Sending And Receiving. E-Mail Protocols, Mailing List, Free Email Services.

Boolean Algebra

Boolean Algebra, Rules And Theorems, De'Morgan Theorem, Duality Principal, Logical Gates, Canonical Equations, K-Maps, Half Adder, Encoder, Decoder.

Structured Programming

Methods Of Documentation. Methods Of Analyzing A Program Requirement. Data Flow Diagrams.

C-Language

- Unit-I: Overview Of C, Introduction & Features Of C, Structure Of C Program, Variables, Expressions, Identifiers, Keywords, Data Types, Constants
- Unit-II: Basic Input/Output And Library Functions, Control Structure
- Unit-III: Single And Multi Dimensional Arrays, Strings
- Unit-IV: Functions, The Need And Form Of C Functions, User Defined And Library Functions

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Paper III: Computer Networking & Programming

Honours Papers

- Unit-V: Structure And Union, Defining Structure, Declaration Of Structure Variable
- Unit-VI: Basic Of Pointers, Operators, Pointers And Function, Passing Arrays To Function
- Unit-VII: Dynamic Memory Allocation, The Process Of Memory Allocation
- Unit-VIII: File Handling, File Structure, File Handling Function
- Unit-IX: Preprocessor Directive & Command

Data Structure

- Introduction To Data Structure, Concept Of Data Structure, Abstract Data Structure, Analysis Of Algorithm
- The Concept Of List, Stack And Queues
- Linked List
- Trees
- Searching And Sorting
- Tables And Graphs

Computer Aided Drafting

Introduction To AutoCAD / RoboCAD Or Similar Package. Advanced Features Of These Packages. Drawing Plan Of A Building Using AutoCAD Etc. Analysis Feature Of AutoCAD

Practical

Design Of Layout Of A Building. Design Of Interior Of Its Rooms. Printing And Plotting The Prepared Drawings. Fashion Designing Through AutoCAD.

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Paper IV: Programming In C And Data Structures

Honours Papers

- Programming In C Language And Project Development. Data Structure Topics As Covered In Paper III.

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Paper V: Programming In Visual Basic & Database Management

Honours Papers

- **Programming In Visual Basic**
 - The Integrated Development Environment Of Visual Basic
 - Menu Bar, Tool Bar, Project Explorer, Tool Box, The Properties Window
 - The Form Designer, Immediate Window
 - Edit View, Run, Debug, Options
 - Using The Application Wizard
 - Mapping Project
 - Concept Of VB Project
 - Creating The Project
 - Opening, Renaming And Saving The Projects
 - Elements Of The User Interface
 - Designing The User Interface
 - Creating Forms And Code Modules
 - Aligning
 - Running The Application
 - Programming An Application
 - Programming The Command Buttons
 - Grouping Controls
 - Visual Development And Event-Driven Programming
 - Common Properties
 - Methods And Common Properties
 - Customizing The Environment
 - Editor Tab, Format Tab, General Tab, Docking Environment Tab
- **Introduction To Visual Basic Language**
 - Variable: Declaring Variable Type Of Variable Converting V Type, User Define Data Type, Special Values, Variable Declaration, A Variable's Scope
 - Constant
 - Arrays, Collections, Procedures, Subroutines, Fur Arguments, Control Flow Statement And Conditional Statements, Looping Statements, Iteration

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Paper V: Programming In Visual Basic & Database Management

Honours Papers

- Working With Forms: Loading, Showing And Hiding Forms, Controlling One Form Within Another, Using Form Templates
- Menus: Designing Menus, Programming Menu Commands, Using Access And Shortcut Keys, Mapping Menus At Runtime
- Mouse Conflicts, Dragging List Items Using Message Boxes And Input Dialogs
- Using Standard Modules Instead Of From Modules
- Active X Commands
- The Text Box Control
- List Box And Combo Box Controls
- The Scroll Box And Slider Control
- Dialog Box
- File Controls
- The Built Active X Controls
- Component Of Visual Basic
- Classes, Instances, Objects
- Encapsulation And Abstraction
- Derived Classes And Base Classes, Classes In Dynamic Binding, Creating Object, Variables Forms As A Classes
- Creating Manipulating Runtime Controls The Object Browser
- Object Linking And Embedding
- Graphics With Visual Basic
- Event Driven Programming, Multiple Document Interface (MDI)
- Interface With Visual Basic And Windows API
- Dynamic Link-Libraries
- Programming And Interfacing With Office
- Database Management System I
 - Categorization Of DBMS Systems. Network, Hierarchical And Relational Database. Application Of DBMS System. Entity Relationship Charts.

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Paper V: Programming In Visual Basic & Database Management

Honours Papers

- Relational Database Management Systems (RDBMS). Why To Use Them And Where. Data Manipulation Language (DML) And Data Control Language (DCL).
- Security Consideration In DBMS, Performance Improvement In Databases.
- Database Management System II
 - Relational Database Advance Concepts. Introduction To ORACLE / INGRESS Or A Similar RDBMS On A Multi User Environment.
 - Structured Query Language (SQL). Form Design On An Advanced RDBMS. Report Generation.
 - Query By Example (QBE) And Report By Form. Accessing RDBMS Using Management. Security Consideration.

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Paper VI: Object Oriented Programming

Honours Papers

- Object Oriented Programming
- Introduction To Object Oriented Programming & C++. Objects, Polymorphism, Inheritance, C++ Fundamentals, Classes And Objects, Function Overloading, Operator Overloading, Constructors & Destructors, Multiple Inheritances, Passing Objects To Functions, Array Of Objects, Pointers To Object, C++ I/O Class Library, C++ Stream, C++ Predefined Streams, C++ Stream Classes
- Java Programming
 - Overview Of Java Language: JAVA Program Structure, Tokens, Java Virtual Machine, Constant & Variables, Data Types, Declaration Of Variables, Scope Of Variables, Symbolic Constants, Type Casting
 - Operators: Arithmetic, Relational, Logical Assignment, Increment And Decrement, Conditional, Bitwise, Special, Expression And Its Evaluation
 - Decision Making And Branching: If Statement, If, Else Statement, Nesting Of If.. Else Statements, Else. If Ladder, Switch ? Operator, Loops, While, Do, For, Jumping Loops, Labeled Loops
 - Classes, Object, Methods: Defining Class, Adding Variable And Methods, Creating Object, Accessing Class Members, Constructor, Methods Of Overloading, Static Members, Nesting Of Methods
 - Inheritance: Extending A Class, Overriding Methods, Final Variable And Methods, Final Classes, Finalize Methods, Abstract Methods And Classes, Visibility Control
 - Array, String And Vectors: Array: One Dimensional, Two Dimensional Strings, Vectors, Wrapper Classes, Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interfaces
 - Multithreaded Programming: Creating Threads, Extending The Threads Class Stopping And Blocking A Thread, Life Cycle Of Thread, Using Thread Methods, Thread Exception, Thread Priority, Synchronization, Implementing The Runnable Interface

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Paper VI: Object Oriented Programming

Honours Papers

- Applet Programming: Local And Remote Applets, Applets Vs Application Writing Applets, Applets, Applets Life Cycle, Creating And Executable Applets, Designing A Webpage, Applet Tag, Adding Applet To Html, Running The Applet, Passing, Parameters To, Applets, Aligning The Display.
- Advanced Topics In Computers
- Introduction To: Computer Animation, Artificial Intelligence. Dedicated Computers, ATM. Data Encryption Data Communication And Networking (Course To Be Modified Every Year To Take Care Of Latest Development). Visit To A Computer Industry.

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Paper VII: Project Work (RDBMS)

Honours Papers

- Design Of A Database For A Business Application. Design Of Data Entry Forms And Reports Layouts For This Databases. Creation Of Programmes To Access And Manipulation Of The Databases. Development Of A Business Application In RDBMS. Creating, Merging, Deleting Tables.
- Project Preparation & Viva-Voce

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Paper VIII: Project Work (C++)

Honours Papers

- Prepare A Project In C++ Programming.
- Project Preparation & Viva-Voce.