ADVANCE POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS (APGDCA) (Regular)

SCHEME OF EXAMINATIONS
With effect from : 2015-16

Semester - 1

Paper Code	Title of Paper	External marks	Internal Assessment	Total Marks
APGDCA-101	Foundation Course in IT And MS-Office -2000	80	20	100
APGDCA-102	Computer Networking & Multimedia	80	20	100
APGDCA-103	Programming in C and Data Structure	80	20	100
APGDCA-104	Computer Organization And Architecture	80	20	100
APGDCA-105	Practical-1 (Based on APGDCA-101 & 103)	80	20	100

Semester - 2

Paper Code	Title of Paper	External marks	Internal Assessment	Total Marks
APGDCA-201	VISUAL C++	80	20	100
APGDCA-202	Visual Basic & Oracle	80	20	100
APGDCA-203	System Analysis & Design	80	20	100
APGDCA-204	Practical-II (Based on APGDCA-201& 202)	80	20	100
APGDCA-205	Project Work, Report & Viva-Voce (Based on any Language, Software Development Tool, etc.)	80	20	100

ADVANCE POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS
APGDCA (Regular)
First Semester With effect from : 2015-16

FOUNDATION COURSE IN IT & MS-OFFICE 2000
PAPER CODE : APGDCA-101

External: 80
Internal: 20

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit

Unit -1

Introduction: Historical evolution of computers, Classification of computers, Model of a digital computer, functioning of a digital computer, Why computers are useful? Human being Vs computer, Computer as a tool, Applications of computers (desktop publishing, sports, design and manufacturing, research and design, military, robotics, planning & management, marketing, medicine & health care, arts, communications).

Number systems and Boolean Algebra : What is Number system, necessity of binary number system, binary, octal and hexadecimal number system, inter-conversion of numbers, binary arithmetic.

Unit - 2

Input/Output Devices : Punched cards, card-readers, key-punching machines, keyboards, mouse, joysticks, trackballs, digitizer, voice-recognition, optical-recognition, scanners, terminals, point-of-sale terminals, machine-vision systems. Hard- copy devices : Print quality, Impact printers - DMPs, Daisy-wheel printers, Line-printers, Drum printers, Chain printers; Non-impact printers - Inkjet, Laser, Thermal, LED; Plotters. Soft-copy devices : monitors, video-standards (VGA and SVGA).

Memory & Mass Storage Devices: Characteristics of memory systems, types of memory, RAM, ROM, magnetic disks - floppy disk, hard-disk; optical disks - CD, CD-I, CD-ROM; Magnetic tapes; Concepts of Virtual and Cache memory.

Unit-3

Software Concepts : Introduction, types of software - System & Application software; Language translators - Compiler, Interpreter, Assembler; Operating system - Characteristics, bootstrapping, types of operating, operating system as a resource manager; BIOS; System utilities - Editor, Loader, Linker, File Manager. Concept of GUI, GUI standards.

Social Concerns : Positive and Negative Impacts of Computer Technology, Viruses and their types, Computer Crimes.

Unit-4

MS-Office 2000

• ***MS-Word :*** Introduction to MS-Word, Standard Toolbar, WordWrap, Text formatting, Formatting Paragraphs, Aplying Effects to Text, Applying Animation to Text.

• ***MS-Excel :*** Introduction to MS-Excel, Working with Toolbars, Formatting, Formulas, Data Management, Graphs & Chart, Macros, and other additional Functions.

• ***MS-PowerPoint :*** Introduction, PowerPoint Slide Creation, Slide-show, Adding Graphics, Formatting, Customizing and Printing.

SUGGESTED READINGS

1. Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
2. Balagurusamy E, Computing Fundamentals and C Programming, Tata McGraw Hill.
3. Norton, Peter, Introduction to Computer, McGraw-Hill
4. Leon, Alexis & Leon, Mathews, Introduction to Computers, Leon Tech World
5. Rajaraman, V., Fundamentals of Computers, PHI
6. Ram, B., Computer Fundamentals, Architecture & Organization, New Age International (P) Ltd.
7. Chhillar, Rajender Singh: Application of IT to Business, Ramesh Publishers, Jaipur.
8. Gill, Nasib Singh: Essentials of Computer and Network Technology, Khanna Books Publishing Co., New Delhi

Note: Latest and additional good books may be suggested and added from time to time.

COMPUTER NETWORKING & MULTIMEDIA

PAPER CODE: A PGDCA - 102

Theory Marks: 80
Internal Assessment: 20

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit

Unit-1

Introduction to Computer Network, Why Computer Network ? Key Issues for Computer Network, Types of Network : LAN, WAN and MAN; Criteria for Classification of Computer Network, LANs : Hardware requirements for LAN, Transmission Channel for LAN, Network Interface Unit, Servers & Workstations, LAN Software. Introduction to Ethernet, Token Ring : Basics and Working, Cables, ring speed. WAN : Transmission Channel for LAN, hardware requirements : Bridges, Routers, Gateways. Private Networks, Public Networks : ISDN, PSTN, PSDN, Value Added Networks.

Unit-2

Connecting PCs : Simple switches, Printer sharing buffers, Zero-slot LANs, Media sharing LANs, Printer Servers, Client and Servers, Interface Cards, Media Access Control, Operating System features, OSI Model, TCP/IP Model, Data encoding & Communication Techniques, Multiplexing and Communication Hardware

Network topology, Network Protocols, Applications of Computer Network. Distributed data rocessing, Teletext and Videotext Networks

Communication Channels : Wire cables (Telegraph, telephone, twisted-pair, co-axial), Microwave, Fibre-optics, Communication satellites; Channel sharing, data-transmission

Unit-3

Introduction to multimedia technology - Computers, Communication and Entertainment; Framework for multimedia systems; M/M devices, presentation devices and the user interface; M/M presentation and authoring; Digital representation of sound and transmission; brief survey of speech recognition and generation; digital video and image compression; JPEG image compression standards; MPEG motion video compression; DVI technology; time-based media representation and delivery.

Unit-4

Audio Compression and Decompression, Audio Synthesis, MIDI, Speech Recognition & Synthesis, Video Capturing, Compression & Decompression, Real-time 3D, LANs and Multimedia.

Applications of M/M; Intelligent M/M system, Desktop Virtual Reality (VR), VR operating System, Virtual environment displays and orientation tracking; visually coupled system requirements; intelligent VR software systems. Applications of environments in various fields viz. Entertainment, manufacturing, business, education, etc.

SUGGESTED READINGS

1. Michael A. Gallo, William M. Hancock, "Computer Communications and Networking Technologies", CENGAGE Learning.
2. Andrew S. Tanenbaum, "Computer Networks", Pearson Education.
3. James F. Kurose, Keith W. Ross, "Computer Networking", Pearson Education.
4. Behrouz A Forouzan, "Data Communications and Networking", McGraw Hill.

Note: Latest and additional good books may be suggested and added from time to time

PROGRAMMING IN C AND DATA STRUCTURE

PAPER CODE: A PGDCA - 103

Theory Marks: 80
Internal Assessment: 20

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit

Unit-1

Introduction to Problem Solving : Top Down Design, Algorithm, Characteristics of Algorithm, Implementation of Algorithms, Efficiency of Algorithms, Analysis of Algorithm..

Fundamental algorithms, Array Techniques, Merging, Sorting & Searching Techniques, Text Processing and Pattern Search, Dynamic Data Structure Algorithms, Recursive Algorithms.

Elements of Program Style, Flowcharts : Flowchart Symbols, Its Types, Benefits and Limitations; Decision Tables, Pseudocodes : Using User Input, Files, Reports and Output on Paper/Console; Practice of Algorithm Development and Flowcharting

Unit-2

C Programming: Basic concepts of programming, problem solving, algorithm designing and flowcharting, concept of structured programming, evolution of C language, advantages of C, variables and constants, operators, expressions, loops, arrays, functions, structures, pointers, file-handling.

Unit-3

Data Structure: Fundamental Notations: Primitive and Composite data types. Time and Space complexity of algorithms.

Data structures: Arrays, Stacks, Queues, Linked Lists, Trees and Graphs.

Unit-4

File Structures: Concepts of fields, records and files. Sequential file organisation, ISAM, Hashing techniques, Inverted Lists and Multilists.

Sorting: Internal and External sorting. Searching techniques and Merging algorithms

SUGGESTED READINGS

1. Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
2. Balagurusamy, E., Programming in ANSI C, 4E, Tata McGraw-Hill
3. Jeri R. Hanly & Elliot P. Koffman, Problem Solving and Program Design in C, Addison Wesley.
4. Yashwant Kanetker, Let us C, BPB.
5. Seymour Lipschutz, "Data Structure", Tata-McGraw-Hill
6. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", Mcgrraw- Hill International Student Edition, New York.

Note: Latest and additional good books may be suggested and added from time to time

COMPUTER ORGANISATION AND ARCHITECTURE

PAPER CODE: A PGDCA - 104

Theory Marks: 80
Internal Assessment: 20

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit

Unit-1

Representation of Information : Number Systems, Integer and Floating-point representation, Character codes – ASCII and EBCDIC

Basic Building Blocks and Circuit Design : OR, AND, NOT, XOR Gates; De Morgan's theorem, Universal building blocks, laws and theorems of boolean algebra, Simplifying logic circuits – sum of product and product of sum form, algebraic simplification, Karnaugh simplification; arithmetic circuits; flip-flops, counters; shift registers; encoder, decoder, multiplexor, demulti-plexor circuits.

Register transfer and Micro-operations: Register Transfer Language, Bus and memory. Transfers, Arithmetic. Logic Micro-operations, Shift Micro-operations

Unit-2

Basic Computer Organization and Design: Instruction and instructions Codes, Computer instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input-Output and Interrupts; Complete Computer Description.

Programming the Basic Computer: Machine Language, Assembly Language, The assembler, program loops, programming Arithmetic and Logic, Subroutines, Inputs-Outputs programming. Micro-programmed Control; Control Memory, Address Sequencing, Micro-programe Example, Design of Control Unit.

Unit-3

Central Processing Unit: General Register Organization Stack Organization Instruction Formats, Addressing Modes, Data and Transfer Manipulation, Program Control, Reduced Instruction Set Computer, Pipeline and Vector Processing parallel processing Pipelining, Arithmetic Pipeline, RISC Ouoekubem Vector Processing, Arrays Processors

Unit-4

Computer Arithmetic: Addition and Subtraction, Multiplication Algorithms, Division algorithm, Floating-Point Arithmetic Operations, decimal arithmetic Unit, Decimal Arithmetic Operations.

Input-Output Organization: Peripheral Devices, Input-Output interface, Asynchronous Data Transfer, Modes of transfer, Priority interrupt, Direct Memory Access(DMA), input-output processors(IOP), serial communication multi-processors, characteristics of multi-processors, Inter-connection structures, Inter-processor Arbitration, Inter-processor Communication and Synchronization, Cache Coherence.

SUGGESTED READINGS

1. Gill, Nasib Singh and Dixit J.B.: Digital Design and Computer Organisation, University Science Press (Laxmi Publications), New Delhi.

2. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.
3. V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd.
4. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
5. Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

Note: Latest and additional good books may be suggested and added from time to time.

PRACTICAL I

PAPER CODE: A PGDCA 105

External Marks: 80
Internal Assessment: 20

Second Semester
VISUAL C++

PAPER CODE: A PGDCA - 201

Theory Marks: 80
Internal Assessment: 20

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit

Unit-I

Visual C++ Basic: Introduction, Building a Basic Application, SDI and MDI. Writing text and drawing graphics, Message boxes, Keyboard and its messages, mouse and its messages.
Visual C++ Resources: Creating Icons, Cursor and Bitmaps. Menu and Accelerators, Toolbar, status bar.

Unit-II

Introduction to Child Window Controls. Check boxes, buttons, list box, Static control, Combo box, edit box, Scroll bars.
Dialog Box: model and modeless dialog box, mechanism of dialog box property page and property sheet

Unit-III

Advance Window Controls: Toolbars up down controls, Spin control, Progress bar, Tree view, Tab controls, Tool tip, slider control, image list control.

Unit-IV

Working with Graphics, Consoles, Multitasking Process and Threads. Clipboard Drag and Drops, Advance features of Windows Programming GDI Metafiles, Sound API, DLL,
.

Suggested Readings:

1. Charles Petzold: Windows Programming, Microsoft Press.
2. Herbett Schildts: Windows Programming, TMH.
3. Murray: VC++, TMH.
4. Steve Holzner: Introduction to VC++.
5. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time

VISUAL BASIC & ORACLE
PAPER CODE: A PGDCA - 202

Theory Marks: 80
Internal Assessment: 20

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit

Unit-1

Visual Basic: Introduction, Analyzing, Controls and Properties, Coding, Loops, Dialog Boxes, Additional Controls- Option Buttons, Frames, Check Boxes, Scroll Bars, Timer Control, Procedures and Functions, Using Debugging Windows, Database Programming, Crystal Reports. Simple Active X controls.

Unit-2

Oracle: ***Introduction to Oracle*** : Overview of RDBMS, Getting started, Modules of Oracle, Invoking SQLPLUS, Data types, Data Constraints, Operators, Data manipulation - Create, Modify, Insert, Delete and Update; Searching, Matching and Oracle Functions.

Unit-3

• ***SQL*Forms*** : Basic concepts, Form Construction, Creating default form, user-defined form, multiple-record form,Master-detail form.

• ***PL/SQL Blocks in SQL*Forms*** : PL/SQL syntax, Data types, PL/SQL functions, Error handling in PL/SQL, package functions, package procedures, Oracle transactions.

• ***SQL*ReportWriter*** : Selective dump report, Master-detail Report, Control-break Report, Test report.

• ***QL*Menu :*** Various menu styles, using pull-down & bar-menu, Authorisation of SQL*Menu, Creating Oracle Menu, Granting Role Access, Generating & Executing Applications.

Unit-4

• ***Database Triggers*** : Introduction, Use & type of database Triggers, Database Triggers Vs SQL*Forms, Database Triggers Vs. Declarative Integrity Constraints, How to apply Triggers ?, BEFORE Vs. AFTER Trigger Combinations, Creating a Trigger, Dropping a Trigger.

• ***Utilities*** : Export/Import, SQL*Loader.

Suggested Readings :

1. McBride, P.K. : Programming in Visual Basic, BPB Publ.
2. Holzner Steven : Visual Basic Programming, IDG Books India Ltd.
3. Artiken : Visual Basic for Programming Explorer, Comdex.
5. Using Visual Basic 6.
6. Any other book(s) covering the content of the paper in more depth.

Note : Latest and additional good books may be suggested and added from time to time

SYSTEM ANALYSIS & DESIGN

PAPER CODE: A PGDCA - 203

Theory Marks: 80
Internal Assessment: 20

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit-1

Overview of system analysis and design. Definition and characteristics of a system, Elements of system, Types of system, system development life cycle, project selection, feasibility, analysis, design, implementation, testing and evaluation.

Unit-2

Project Selection : Source of Project requests, managing project review and selection, preliminary investigation. Feasibility Study : Technical and economical feasibility, cost and benefit analysis

System requirement specification and Analysis : Fact finding techniques, Data flow diagrams, data dictionaries, process organization and interactions, Decision analysis, decision trees and tables.

Unit -3

System Design: System design objective, Logical and physical design, Design Methodologies, structured design, Form-Driven methodology(IPO charts), structured walkthrough, Input/Output and form design: Input design, Objectives of input design, Output design, Objectives of output design, Form design, Classification of forms, requirements of form design, Types of forms, Layout considerations, Form control.

UNIT-4

System testing: Introduction, Objectives of testing, Test plan, testing techniques/Types of system tests, Quality assurance goals in system life cycle, System implementation, Process of implementation, System evaluation, System maintenance and its types, System documentation, Forms of documentation.

SUGGESTED READINGS

1. Systems Analysis and design BY e.m. aWAD Galgotia Pub.(P) Ltd.
2. Data Management and Data Structures by Loomis (PHI)
3. System Analysis and Design by Elias Awad.
4. Introductory System analysis and Design by Lee Vol. I & II

Note: Latest and additional good books may be suggested and added from time to time.

PRACTICAL II

PAPER CODE: A PGDCA 204

External Marks: 80
Internal Assessment: 20

PAPER CODE: A PGDCA 205

Project Work, Report & Viva-Voce

(Based on any Language, Software Development Tool, etc.)

External Marks: 80

Internal Assessment: 20