

Post Graduate Diploma in Computer Application

SCHEME OF EXAMINATION & Syllabus for PGDCA (Examination 2017)

ELIGIBILITY FOR ADMISSION

Graduates possessing 40% marks in any faculty of any statutory university shall be eligible for admission to the PGDCA Course. (Relaxation to SC/ST etc. as per Government/University Rules)

PASS CRITERIA

For a pass in the examination, a candidate is required to obtain at least 40% in each paper (Theory, Practical and Project) and 36% marks in the total aggregate.

CLASSIFICATION OF SUCCESSFUL CANDIDATE

Class	Total Marks
First Division	60% and above
Second Division	50% and above

Teaching and Examination scheme for PGDCA Examination 2017


Paper	Paper Name(Theory)	Lect/ week	Tuto/ week	Exam Hours	Max Marks
PGDCA-101	Computer Organization	3	1	3	100
PGDCA-102	Programming with C++	3	1	3	100
PGDCA-103	Relational Database Management System	3	1	3	100
PGDCA-104	Operating System	3	1	3	100
PGDCA-105	Network and Web	3	1	3	100
PGDCA-106	Software Engineering and GUI Programming	3	1	3	100
PGDCA-107	Project	3		3	100
	Total of Theory				700
	Paper Name (Practical)				
PGDCA108	Programming with C++			3	100
PGDCA 109	Relational Database Management System			3	100
PGDCA 110	GUI Programming			3	100
	Total				300
	Grand Total (Theory + Practical)				1000

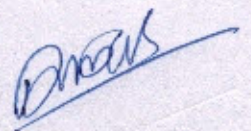
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Note:

1. At least 3 classes for theory and 3 classes for practical should be assigned per week for each paper.
2. Ten questions will be set in all papers taking two questions from each unit. Students will have to attempt one question from each unit.
3. Each practical exam is to be conducted by two examiners one External and one Internal. External examiner should be senior lecturer from jurisdiction of MGS University. External examiner will prepare question paper of Practical Examination. Students have to perform exercise on computer. Exercise must be written in answer books in proper documentation. Marks distribution for Practical of 100 marks is as under
 - a) Four Exercise of 15 marks each 60 Marks
(Logic 06, Execution 05, Documentation 04)
 - b) Viva-Voce 20 Marks
 - c) Laboratory Exercise File 20 marks
4. Marks distribution for Project of 100 marks is as under
 - a) Project Dissertation and Presentation 75 marks
 - b) External Viva Voce 25 marks


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Duration: 3 Hours

MM: 100

PGDCA-101 Computer Organization

Unit I

Digital computer: Data Type, Number System, Complements, Fixed-Point Representation, Floating Point representation, Gray Code, BCD code, ASCII Codes, Unicode, Error Detection codes, Logic gate, Boolean Algebra, Map Simplification, Combinational circuit, Sequential circuit, Decoders, Multiplexers, Flip Flops, Registers, Counters.

Unit II

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, and Memory Management Hardware.

Unit III

Input- Output organization: Input-Output Interface, Asynchronous Data Transfer, Mode of Transfer, Priority Interrupt, Direct Memory Access (DMA), Input-Output Processor (IOP), Serial Communication.

Unit IV


Central Processing Unit: Stack Organization, Instruction formats, Addressing Modes, Data Transfer and manipulation, program Control, Reduced Instruction Set Computer (RISC), CISC Characteristics, RISC Characteristics. Control Design-hardwired Control, Micro-Programmed.

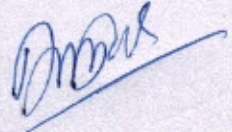
Unit V

Microprocessor Architecture: Introduction, Intel 8085- ALU, Timing and Control Unit, Register, Data and Address Bus, Pin Configuration, Intel 8085 Instruction, Opcode and Operand Instruction Word Size, Instruction Cycle. Instruction Set of Intel 8085: Introduction, Instruction and Data Formats, Addressing Modes, Status Flags, Symbols and Abbreviations, Intel 8085 Instruction.

Reference:

1. Computer System Architecture, By M. Morris Mano (Pearson, Prentice Hall)
2. Fundamentals of Microprocessor and Microcomputes By B.Ram (Danpat Rai Publications)
3. Microprocessor Architecture, Programming, and Application With the 8085 By Ramesh Gaonkar (PENRAM)


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Duration: 3 Hours

MM: 100

PGDCA-102 Programming with C++

Unit I

Object Oriented System: Difference Between Procedural and Object Oriented Languages, Object Oriented Paradigm, Inheritance, Polymorphism, Abstraction, Encapsulation, Benefits and Application of Oops. **Introduction to C++:** Character Set, Token, Constants, Variables and Data Types, Enumeration Types, Operators, Expressions, Operator Precedence and Associativity, Integer Overflow and Underflow, Input, Output, Conditional Statements, Scope of Variables, Type Conversion.

Unit II

Iteration : while, do while, for, Break, Continue, goto; **Pointers:** Introduction, implementation advantage and disadvantage. **Functions** - Standard and User-Defined Function, Recursive Function, Passing By Value And Reference, Function Overloading Pointer and Function: Function Returning Pointer, Passing pointer as argument, Reference and Functions. Structures and Pointers.

Unit III

Array: introduction, advantage, One, Two and Multidimensional, Passing Array to a Function, **Array and Pointers :** Pointer to One and Two Dimensional Arrays, Array of Pointers. Dynamic Arrays, String Processing. **Class:** Introduction to Class and Object, Declaring Members and Methods in a class, declaring objects.

Unit IV


Functions and objects: Calling member functions, Passing objects as arguments, Functions Returning Objects. Inline Function, Friend Functions and Its Usage, Abstract Class, Function Overriding. **Constructor and Destructor-** Needs and Its Usage, Types of Constructors, Destructor, Pointer to Objects, Pointers to Members, Dynamic Class and Objects, Static Data Members and Methods. **Inheritance** - Need of Inheritance, Types of Inheritance and its implementation.

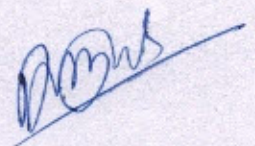
Unit V

Operator Overloading: Need and Rules of Operator Overloading, Overloading Through Member Function and Friend Function. **Type Conversion-** Basic to Class, Class to Basic, One Class to Another Class. **Compile Time and Run Time Polymorphism-** Virtual Function and virtual class. String Class, Stream Classes in C++, Manipulators, Templates and File Handling.

References:

1. Object Oriented Programming With C++ By E. Balagurusamy (Tata Mcgraw Hill)
2. C++ The Complete Reference By Herbert Schildt (Tata Mcgraw Hill)
3. Object Oriented Programming With C++ By Schaum Series (Tata Mcgraw Hill)


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PGDCA-103 Relational Database Management System

Unit I

Introduction to DBMS: Components, Structure, Different Views of Data, Advantage, Data Models: Hierarchical, Network, Relational, Object Relational Models, Codd's Rules. **E-R Model** : Entities, Attributes, Associations, Relationship, Keys, E-R Diagram. **Normalization** : 1NF, 2NF, 3NF, 4NF, BCNF.

Unit II

Relational Database: Structure of Relational Database, **Modification of a Database:** Deletion, Insertion, Updation, Selection, View, **Relational Algebra.** Set Theoretical Operations : Selection, Projection, Join Division, Cartesian Product, Referential Integrity. **Relational Calculus:** Tuple Relational Calculus, Domain Relational Calculus. **File Organization:** Heap, Serial, Sequential, Index Sequential, Hash-Indexing, B-Tree File Organization.

Unit III

Introduction to SQL: DDL, DML, DCL, Data Types, Table: Constraint, Domain, Entity, Referential Integrity, Create, Alter, Drop Table, Commands: Insert, Update, Delete With Where, Queries and SQL Functions, Sequence, View, Index, Granting Privilege, Report Writing.

Unit IV


Introduction to PL/SQL: Advantages, Character Set, Data Types, Control Structure, Transaction, Cursor, Locks, Error Handling, Procedure and Function, Triggers. **Recovery:** Reliability, Transactions, Reflecting Update to the Database and Recovery, Buffer Management, Virtual Memory and Recovery, Disaster Recovery.

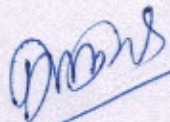
Unit V

Concurrency Management: Serializability, Concurrency Control, Locking Scheme. Dead Lock and Its Resolution, Atomicity, Concurrency and Recovery. **Database Security Integrity and Control:** Security and Integrity Threats, Defence Mechanism.

References:

1. Database System Concepts By Korth, Silberschatz, Sudarshan (Mcgraw Hill)
2. An Introduction to Database Systems By Bipin C. Desai (Galgotia Publication.)
3. SQL, PL/SQL Programming By Ivan Bayross (BPB)
4. Commercial Application Development Using Oracle Developer 2000 By Ivan Bayross (BPB)


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PGDCA-104 Operating System**Unit I**

Introduction, **Operating System Structure** : CPU Management, File Management, Memory Management, I/O Management, **Types of Operating System** : Simple Batch Operating System, Multiprogramming Batch Mode Operating System, Time-Sharing System, Parallel System, Distributed System, Real Time System, **Network System, Distributed System.**

Unit II

Process : Process Concept, Process Control Block (PCB), Process States and Relationship, Process Switch, Threads. **Process Communication & Scheduling**: CPU – I/O Burst Cycle, CPU Scheduler, Pre-Emptive Scheduling, Scheduling Criteria, CPU Utilization, Throughput, Turnaround Time Waiting Time, Response Time, **Scheduling Algorithm** : FCFS(First Come First Serve), SJF(Shortest Job First), Priority Scheduling, RR(Round Robin) Scheduling, MLQ(Multi Level Queue) Scheduling, MLQ With Feedback.

Unit III

Memory Management: Swapping, Paging, Structure of the Page Table, Segmentation. **Virtual Memory Management** : Demand Paging, **Page Replacement** : Basic Page Replacement, FIFO (First In First Out), LRU (Least Recently Used), Optimal. **File System** : File Concept, Access Method, Directory Structure, Protection.

Unit IV

Process Co-Ordination : Synchronization, Critical Section Problem, Semaphores, Readers and Writers Problem, **Deadlocks** : Characterization, Deadlock and Starvation, Deadlock Prevention, Avoidance, Banker's Algorithm, Recovery from Deadlock.

Unit V

Linux/ Unix: Introduction, File System, Inode and Block Storage, File and Directory Structure and Permissions, File Related Commands, Shell and Kernel, Process- Init, Getty and Login Process, Killing, Changing Priority. Backup and restore files, installing and removing packages with yum rpm command, VI Editor. System administration: Managing user accounts-adding & deleting users, changing permissions and ownerships. **Shell Script**: Variables, Shell Programming- Decision Making, Loop Structure, Input and Output.

References:

1. Operating System Principals By Abraham Silberschatz, Peter Baer Galvin (John Wiley And Sons Inc.)
2. Operating System Concepts And Design By Milan Milen Kovic (Tata Mcgraw Hill)
3. Teach Yourself UNIX By Kevin Reichard, Eric F Johnson (BPB)
4. Using UNIX By Philiplaplante (Jaico Publishing House)
5. Unix Concept By Yashwant Kanetkar (BPB Publication)

Duration: 3 Hours

MM: 100

PGDCA-105 Network and Web

Unit I

Data Communication, Networks, Protocol and Standards, Topology, **Transmission Mode** : Simplex, Half Duplex, Full Duplex, LAN, MAN, WAN, the OSI Model, TCP/IP Protocol, Analog and Digital Transmission, **Network Security** : Privacy, Authentication, Integrity, Non-Repudiation. **Cellular Telephony** : Frequency Reuse Principal, Transmission, Receiving, Handoff, Roaming, First Generation, Second Generation, Third Generation. **Firewall**: Benefit and Type of Firewall.

Unit II

Internet Basics : Evolution of Internet, Basic Internet Terms (Client, Server, MODEM, Website, Search Engine, Browser, URL, ISP, Web Server, Download and Upload, Online, Offline etc.), Internet applications (Remote Login, VoIP, Video Conferencing, Audio Video Streaming, Chatting etc.), FTP and its Usages; Types of Wireless Communications (Mobile, WiFi, WiMAX, Bluetooth, Infrared), Anatomy of an e-mail message, basics of sending and receiving, E-Mail Protocol.

Unit III

Introduction to World Wide Web: Working of Web Browsers, its functions, category, Hyper Text Transfer Protocol (HTTP); Component of Web Publishing, Domain Name Registration, Space on host server for Web Site. **HTML** : Designed Tools, HTML Editors, Issues in Website Creations and Maintenance, Elements of HTML, & Syntax, Building HTML Documents, Backgrounds, Formatting Tags, Images, Hyperlinks, Div Tag, List Type and its Tags, Table Layout, Use of Frames and Forms in Web Pages, CSS Style Sheets, Forms, Tables.

Unit IV

CSS: Elements of Style Sheets, Using Embedded Style Sheets and Linked Style Sheets, Inline Style Sheets, using classes, Style Sheet Precedence, Div and Span. **Java Script** : Working with Variables, Operators, Control Structures, Built-in functions, Outputting to the browser. Images, rollovers, handling events. Uses of Client Side, Java Script and Server Side Java Script; **VB Script** : Working with Variables, Operators, Control Structures, Built-in-Functions.

Unit V

E-Commerce : Introduction, Advantages and Disadvantages, Internet and E-Business, Applications; **Electronic Payment Systems**: Introduction, Types of Electronic Payment Systems, Smart Cards and Credit Card-Based Payment System, Introduction to E-Governance and its applications, **Cyber Crime** : Definition, Cyber Crime and Information Security; Classification of cyber crime, Cyber Crime, Cyber Law, The Indian IT Act, Cyber Crisis Management. Cyber Crime and Punishment, Cyber Law Technology and Students: Indian Scenario.

References:

1. Data Communication And Computer Networks.By Dr. Madhulika Jain, Satish Jain (BPB)
2. Web Enabled Commercial Application Development using HTML, DHTML, Java Script, Perl CGI by Ivan Bayross(BPB)
3. Internet and Web Page Designing by V.K. Jain.
4. Cyber Security by Nina Godbole & Sunit Belapure
5. Introduction to E-Commerce by Jeffery F. Rayport, Bernard J. Jaworsski, McGraw Hill.

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PGDCA-106 Software Engineering and GUI Programming

Unit I

Software : Software Characteristics, Software Process, Process Characteristics, **Software Process Model** : Linear Sequential Model, Prototyping Model, Spiral Model, Software Quality, McCall's Quality Factors, **Software Requirement Analysis and Specification (SRS)** : Need Characteristics and Components. **Planning a Software Project**: COCOMO Model, Project Monitoring Plan and Risk Management.

Unit II

Design Principle : Abstraction, Modularity, Cohesion and Coupling, **Software Management** : Size Oriented Matrices, Function Oriented Matrices. **Testing** : Testing Fundamental, Functional Testing (Black Box), Structural Testing (White Box), Alpha And Beta Testing, **Testing Process** : Comparison of Different Testing, Level of Testing. **SCM** : Need for SCM, **Version control** : Introduction to SCM process – Software configuration items.

Unit III

Integrated Development Environment, Event Driven Programming, Controls and Events, Data Types, Variables, Constants, Control Flow Statements, Loop Statements Exit Statements, Arrays, Controls Array, Collections, procedures, Function, Recursive Functions, Working With Forms, **Controls**: Textbox, List Box, Combo Box, Options Button, Check Box, Timer, Scroll Bar, Slider, Progress Bar, Tool Bar, Status Bar.

Unit IV

Designing menus: Menu Bar, ContextMenu, access & shortcut keys; Common Dialogs Control: Open, Save, Print, Color, Font, Help, MsgBox & Inputbox. Multiple File Selection, Tree and List View Controls, Drawing: Graphics Controls, Co-ordinate Systems, Graphics Methods. Manipulating Color and Pixels with VB, Modules, Testing And Debugging Techniques.

Unit V

Database programming: Data controls, Data Aware Controls, Data Manager, **DAO (Direct Access Objects)**: Methods and Connectivity, **ADO (ActiveX Data Objects)**, Connectivity with Oracle, Advantages of ADO over DAO, ODBC, Reports Writing: Data Report, Crystal Reports.

Reference:

1. Mastering Visual Basic 6 By Evangelos Petroutsos (BPB)
2. Visual Basic 6 programming- Black Book By Steven Holzner (Dream Tech Press)
3. Beginners Guide to Visual Basic 6 By Reeta Sahoo and G.B. Sahoo (Khana Publication House)
4. Software Engineering: A Practitioner's Approach by Roger S. Pressman, McGraw Hill.

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PROJECT

MM: 100

Practical Training and Project Work:

1. Project Work may be done individually or in groups in case of bigger projects. However if project is done in group each student must be given a responsibility for a distinct module and care should be taken to monitor the individual student.
2. Project Work can be carried out in the college or outside with prior permission of college.
3. The Student must submit a synopsis of the project report to the college for approval. The Project Guide can accept the project or suggest modification for resubmission. Only on acceptance of draft project report the student should make the final copies.

Submission Copy:

The Student should submit Spiral bound copy of the project report.

Format of the Project:

(a) **Paper:**

The Report shall be typed on White Paper of A4 size.

(b) **Final Submission:**

The Report to be submitted must be original.

(c) **Typing:**

Font:- Times New Roman

Heading:- 16 pt., Bold

Subheading:- 14 pt, Bold

Content:- 12 pt.

Line Spacing:- 1.5 line.

Typing Side :- One Side

Font Color:- Black.

(d) **Margins:**

The typing must be done in the following margin:

Left : 0.75"

Right: 0.75"

Top: 1"

Bottom: 1"

Left Gutter: 0.5"

(e) **Binding:**

The report shall be Spiral Bound.

(f) **Title Cover:**

The Title cover should contain the following details:

Top: Project Title in block capitals of 16pt.

Centre: Name of project developer's and Guide name.

Bottom: Name of the university, Year of submission all in block capitals of 14pt letters on separate lines with proper spacing and centering.

(g) **Blank sheets:**

At the beginning and end of the report, two white blank papers should be provided, one for the Purpose of Binding and other to be left blank.

(h) **Content:**

I). Acknowledgement

II). Institute/College/Organization certificate where the project is being developed.

III). Table of contents

IV). A brief overview of project

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- V). Profiles of problem assigned
- VI). Study of Existing System
- VII). System Requirement
- VIII). Project plan
 - o Team Structure
 - o Development Schedule
 - o Programming language and Development Tools
- IX). Requirement Specification
- X). Design
 - o Detailed DFD's and Structure Diagram
 - o Data structure, Database and File Specification

- XI). Project Legacy
 - o Current Status of project
 - o Remaining Areas of concern
 - o Technical and Managerial Lessons Learnt
 - o Future Recommendations
- XII). Nomenclature and Abbreviations.
- XIII). Bibliography
- XIV). Source Code.



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