DEPARTMENT OF DISTANCE EDUCATION
PUNJABI UNIVERSITY, PATIALA

SYLLABUS

POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS
(PGDCA Annual)
(2020 & 2021 EXAMINATIONS)

Paper code	Title of the paper	University Examination	Internal Assessment	Maximum Marks
PGDCA-1	Introduction to Information Technology	80	20	100
PGDCA-2	Operating System	80	20	100
PGDCA-3	Database Management System	80	20	100
PGDCA-4	Problem solving using C	80	20	100
PGDCA-5	Introduction to Computer Network Internet and E-Commerce	80	20	100
PGDCA-6	Management Information System	80	20	100
PGDCA-7	Software Lab-I (DOS, Windows, Unix)	40	60	100
PGDCA-8	Software Lab-II (MS-Office : Excel, Word, Power Point, MS-Access	40	60	100
PGDCA-9	Software Lab-III (Programs to be implemented in C)	40	60	100
PGDCA-10	Software Lab-IV (Web Designing, HTML and Other Scripting Languages)	40	60	100

Note: Internal Assessment

1. 90% marks are allotted to the Internal assessment.
2. 10% marks are allotted to the attendance during both of the PCPs.

PGDCA-1: INTRODUCTION TO INFORMATION TECHNOLOGY

Maximum Marks : **80**
Minimum Pass Marks : **40** % Time allowed : **3 Hrs.**

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 16 marks for each question. Section C will consist of 7-16 short answer type questions covering the entire syllabus uniformly and will carry a total of 16 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
2. Use of non-programmable scientific calculator is allowed.

SECTION-A

Historical Evolution of Computer: characterisation of computers, types of computers, the computer generations.

Basic Anatomy of Computers: memory unit, input-output unit, arithmetic logic unit, control unit, central processing unit, RAM, ROM, PROM, EPROM.

Input-Output Devices: punched hole devices, magnetic media devices, printers, keyboard, scanners, other devices such as plotters, voice recognition and response devices, off-line data entry devices.

Number System: non-positional and positional number systems, base conversion, fractional numbers, various operations on numbers.

Computer Code: computer words, characters data, weighted and non weighted code, BCD, EBCDIC, ASCII, grey code.

Boolean Algebra and Logic Circuit: Boolean algebra, Boolean functions, logic gates.

SECTION-B

Computer Software : Introduction, types of software, systems software, GUI, operating system, high level languages, assemblers, compilers and interpreters, system utilities, application packages, stages in the development of software, program testing and debugging, program documentation, concept of firmware.

Networking: Basics, types of networks (LAN, WAN, MAN), hardware and software for LAN and WAN, topologies, Information, data processing, Data base concepts, database

redundancy, inconsistency, difficulty in accessing the data, concurrent access anomalies, security problem, integrity of data.

Books :

1. V Rajaraman, " Fundamentals of Computer", PHI, N. Delhi, 1996.
2. N Subramanium, "Introduction to computers", Volume -I.
3. Dr. Rajesh Trehan, "A complete book on IT", Cyber Tech.

PGDCA-2 : OPERATING SYSTEMS

Maximum Marks : **80**
Minimum Pass Marks : **40** % Time allowed : **3 Hrs.**

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 16 marks for each question. Section C will consist of 7-16 short answer type questions covering the entire syllabus uniformly and will carry a total of 16 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
2. Use of non-programmable scientific calculator is allowed.

SECTION-A

Introduction to operating System: Need of operating system, operating system services, Definition, Early systems

Types of operating systems: Batch processing operating system, Multiprogramming operating system, Time Sharing operating system, Multi tasking operating system, Distributed operating system, Network operating system, Real time operating system, Multi processor System and parallel processing.

Disk Operating System (DOS): Booting process of DOS, Purpose of autoexec.bat and config.sys, internal commands and external commands, using wild card characters, Creating batch files, getting and setting date, time and prompt, Disk related commands-Format, Fdisk, Chkdsk, Scandisk, Defrag.

SECTION-B

Windows: GUI, Icon, Toolbar.
Working with files, closing and saving a file.
Mouse Mechanics-Click, Double click, Drag and drop method.

Installation of a new software, Control panel, Explorer, Accessories, network neighbourhood, System tools, Recycle bin, Files and Directory management under windows, Running programs.

Unix: Structure of Unix, Kernel and shell, Commands of Unix, Unix file system, own file system, Electronic mail.

Vi Editor: Editing text, screen controls.

Printing and spooling.

Text books:

1. Andy Rathbone, "Windows for dummies", Pustak mahal, 2nd ed. 1996.
2. Stan Kelly-Bootle, "Understanding UNIX", BPB Publications (ed. 1997).
3. Silverschatz , "Operating system concepts", Pearson education India, 5th ed. 1998.

PGDCA-3 : DATABASE MANAGEMENT SYSTEM

Maximum Marks : **80**

Minimum Pass Marks : **40** % Time allowed : **3 Hrs.**

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 16 marks for each question. Section C will consist of 7-16 short answer type questions covering the entire syllabus uniformly and will carry a total of 16 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Introduction: Database Approach, Characteristics of a Database Approach, Database System Environment.

Roles in Database Environment: Database Administrators, Database Designers, End Users, Application Developers.

Database Management Systems: Definition, Characteristics, Advantages of Using DBMS Approach, Classification of DBMSs.

Architecture: Data Models, Categories of Data Models- Conceptual Data Models, Physical data Models, Representational Data Models, such as, Object Based Models, Record Based Models, Database Schema and Instance, Three Schema Architecture, Data Independence – Physical and Logical data Independence.

Database Conceptual Modelling by E-R model: Concepts, Entities and Entity Sets, Attributes, Mapping Constraints, E-R Diagram, Weak Entity Sets, Strong Entity Sets.
Enhanced E-R Modelling: Aggregation, Generalization, Converting ER Diagrams to Tables.

Relational Data Model: Concepts and Terminology, Characteristics of Relations.
Constraints: Integrity Constraints- Entity and Referential Integrity constraints, Keys- Super Keys, Candidate Keys, Primary Keys, Secondary Keys and Foreign Keys.

SECTION B

Relational Algebra: Basic Operations, Additional Operations, Example Queries.
Database Design: Informal Design Guidelines for Relation Schemas, Problems of Bad Database Design.
Normalization: Functional Dependency, Full Functional Dependency, Partial Dependency, Transitive Dependency, Normal Forms– 1NF, 2NF, 3NF, Boyce-Codd NF.

MS-ACCESS: introduction to MS-ACCESS, working with databases and tables, queries in Access, Applying integrity constraints, Introduction to forms, sorting and filtering, controls, Reports and Macro: creating reports, using Macros.

Text Book:

1. Elmisry Nawathy, “Introduction to Database Systems”, Pearson Education India.
2. Content Development Group” Working with MS-OFFICE 2000 “, TMH.

References:

1. Henry F. Korth, Abraham, "Database System Concepts", Tata McGraw Hill.
2. Naveen Prakash, Introduction to Database Management”, TMH, 1993.
3 C.J. Date, "An Introduction to Data Base Systems", Pearsoned Education India.

PGDCA-4 : PROBLEM SOLVING USING C

Maximum Marks : **80**
Minimum Pass Marks: **40** % Time allowed: **3 Hrs.**

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 16 marks for each question. Section C will consist of 7-16 short answer type questions covering the entire syllabus uniformly and will carry a total of 16 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Programming process: Problem definition, program design, coding, compilation and debugging Identifiers and keywords, data types, input and output, type conversion, operators and expressions: Arithmetic, unary, logical and relational operators, assignment operator, conditional operator, library functions.

Control statements: branching, looping using for, while and do-while statements, nested control structures, switch, break and continue statement.
Functions: definition, call prototype and passing arguments to a function, recursion versus iteration.
Storage classes: automatic, external and static variables.

SECTION B

Arrays: Definition, accessing elements, initialization, passing to functions, multi dimensional arrays, strings
Pointers: address and deterencing operators, declaration, assignment, passing pointer to functions, pointer arrays.
Structure: variables, accessing members, nested structures, pointer to structures, self referential structures.

Searching and sorting techniques, linear and binary search, bubble,insertion, selection and quick sorting on array and their comparisons.

Text Books

1. Byron Gottfried , "Programming with C, Second edition, Schaum' s outline series" TMH
2. Shubhnandan S. Jamwal, Programming in C, Pearson Publications

Reference books:

1. Ram Kumar and Rakesh Aggarwal : Programming in Ansi C, TMH.
2. B.W. Kerrighan and D.M.Richie, " The C programming language", 2nd edition, PHI.
3. H.H. Tan & T.B. Dorazio," C Programming for engineers & Computer Science", Mcgraw Hill international edition.

PGDCA-5: INTRODUCTION TO COMPUTER NETWORK, INTERNET AND E-COMMERCE

Maximum Marks : **80**

Minimum Pass Marks: **40** % Time allowed : **3 Hrs.**

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 16 marks for each question. Section C will consist of 7-16 short answer type questions covering the entire syllabus uniformly and will carry a total of 16 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Computer Networks : definition, need for computer networks and advantages, Hardware, Software, Users, Reference Models : OSI Reference Model, TCP/IP reference Model, Types of Networks: LAN, WAN, MAN, and value added network, there features, network topologies

Transmission media: magnetic media, twisted pair, co-axial cable, radio transmission, line of sight transmission and communication satellite, wireless transmission.

Switching: Virtual Circuits versus Circuit Switching.

SECTION B

Introduction to Internet: Relays: Repeaters, Bridges, Routers, Gateways.

Internet working: How networks differ, concatenated virtual circuits, connectionless internetworking, Firewalls, internet architecture.

Applications of internet: Email, WWW and multimedia, FTP: introduction, data transfer and distributed computation.

WWW: the client side, the server side, web browser, Net surfing.

Electronic Commerce Framework, Electronic Commerce and media Convergence, The Anatomy of E-commerce Applications.

Electronic Data Interchange, EDI Applications in Business, EDI: Legal, Security and Privacy Issue.

Text Books :

1. Andrew S. Tanenbaum, “Computer Networks”, Pearsoned Education India.

Reference books:

1. Douglas E. Comer, "Computer Networks and Internets" Pearsoned Education.
2. Achute S Godbole,"Data Communications and Networks", Tata Mcgraw Hill.

PGDCA-6: MANAGEMENT INFORMATION SYSTEM

Maximum Marks : **80**
Minimum Pass Marks: **40** % Time allowed: **3 Hrs.**

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 16 marks for each question. Section C will consist of 7-16 short answer type questions covering the entire syllabus uniformly and will carry a total of 16 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Framework of Management Information Systems: Importance's of MIS, Concepts of Management, information, system, Definition of MIS, information technology and MIS, nature and scope of MIS, MIS characteristics and functions.

Structure and classification of MIS: structure of MIS, MIS classification, Brief introduction of functional information system, financial information system, marketing information system, production/ Manufacturing information system, human resources information system.

Decision making and MIS**:** decision making, Simon's model of decision making, types of decisions, purpose of decision making, level of programmability, knowledge of outcomes, methods of choosing among alternatives, decision making and MIS.

Information and system concepts: types of information: strategic information, Tactical information, Operational information. Information quality, dimensions of information, System: Kinds of Systems, System related concepts, elements of systems, Human as an information processing system.

SECTION B

System development stages**:** System investigation, system analysis, system design, construction and testing, implementation, maintenance.

System development approaches (a brief introduction): waterfall model, pro-typing, iterative enhancement model, spiral model.
System analysis: introduction, requirement definition, , strategies for requirement definition, structured analysis tools: data flow diagram, data dictionary, decision trees , structured English, decision trees.
System Design: objectives, conceptual design, design methods, detailed system design.

Implementation and evaluation of MIS: implementation process, Hardware and software selection, Evaluation MIS, System maintenance.
Information system Planning: Information system Planning, planning terminology, the Nolan stage model, selecting a methodology, information resources management.
Information system (IS) as an Enabler: introduction, changing concepts of IS , IS as an enabler

Text books:
D.P. Goyal, "Management information systems", Macmillan India Ltd.

References:
1. Bentley,"System Analysis and Design", TMH.
2. Robert G. Murdick & Joel E. Ross & James R. Claggett, "Information Systems for Modern Management" PHI.
3. Gordon B. Davis & M.H. Olson, "Management Information Systems: Conceptual Foundation, structure & Development".

PGDCA-7: SOFTWARE LAB-I (DOS, WINDOWS, UNIX)

Maximum Marks 100 *
Minimum Pass marks : 40% Time allotted : 3 Hrs.

DOS: Booting under DOS, Internal and External Commands of DOS,

WINDOWS: Windows concepts, features, windows structure, desktop, taskbar, start menu, my computer, Recycle Bin, Windows Accessories. System Tools**,** communication, Sharing Information between Programs.

UNIX: Booting Process, Kernel, Shell, Directory structure and commands, vi editor

*Maximum Marks for continuous assessment : 60
Maximum Marks for University examination : 40

PGDCA-8: SOFTWARE LAB-II (MSOFFICE: EXCEL, WORD, POWERPOINT, and MS-ACCESS)

Maximum Marks 100 *
Minimum Pass marks : 40% Time allotted : 3 Hrs.

Word Processing: MS Word: - Introduction to Word Processing, Interface, Toolbars, Ruler, Menus, Keyboard Shortcut, Editing a Document, Previewing documents, Printing documents, Formatting Documents, Checking the grammar and spelling, Formatting via find and replace, Using the Thesaurus, Using Auto Correct, Auto Complete and Auto Text, word count, Hyphenating, Mail merge, mailing Labels Wizards and Templates, Handling Graphics, tables and charts, Converting a word document into various formats.

Worksheets: MS EXCEL - Creating worksheet, entering data into worksheet, heading information, data, text, dates, alphanumeric, values, saving & quitting worksheet, Opening and moving around in an existing worksheet, Toolbars and Menus, keyboard shortcuts, Working with single and multiple workbook, Working with formulas & cell referencing, Formatting of worksheet.

Exercises related to section (D) of Paper PGDCA-3 (DBMS)

MS-Powerpoint: Creating slides, Applying transitions and sound effects, setting up slide shows, Animation.

*Maximum Marks for continuous assessment : 60
Maximum Marks for University examination : 40

PGDCA-9: SOFTWARE LAB-III (PROGRAMMING TO BE IMPLEMENTED IN C)

Maximum Marks 100 *
Minimum Pass marks : 40% Time allotted : 3 Hrs.

1. Programs to be developed based upon various constructs in the C language
2. Searching and sorting algorithm to be developed in C language.

*Maximum Marks for continuous assessment : 60
Maximum Marks for University examination : 40

PGDCA-10 : SOFTWARE LAB-IV (WEB DESIGNING, HTML AND OTHER SCRIPTING LANGUAGES)

Maximum Marks 100 *
Minimum Pass marks : 40% Time allotted : 3 Hrs.

HTML: Tables, Forms, Frames and other Text Formating Tags
DHTML: Cascading Style Sheets and Document Object Model
Javascript: Introduction to Javascript.

*Maximum Marks for continuous assessment : 60
Maximum Marks for University examination : 40

Laser Type-Setting By :

Comp. Lab, Depart. of Distance Education, Punjabi University, Patiala