

ORDINANCES  
AND OUTLINES OF TESTS,  
SYLLABI AND COURSES OF READING

FOR

ONE-YEAR POST GRADUATE DIPLOMA IN COMPUTER  
APPLICATIONS (PGDCA)  
(Semester 1st and 2nd)

FOR

2010-11 and 2011-2012

**PUNJABI UNIVERSITY**  
**PATIALA – 147 002**

**ORDINANCES FOR**  
**Post Graduate Diploma in Computer Applications (P.G.D.C.A.)**  
**Course Examination**  
*Applicability of Ordinances for the time being in force*

Notwithstanding the integrated nature of a course spread over one year, the Ordinances in force at the time a student joins a course shall hold good only for the examination held during or at the end of the year. Nothing in these ordinances shall be deemed to debar the University from amending the ordinances subsequently and the amended ordinances, if any, shall apply to all the students whether old or new.

**1. STRUCTURE AND DURATION OF THE PROGRAMME:**

- The course for the Degree of PGDCA. (Post Graduate Diploma in Computer Applications) shall be spread over one academic year to be called Semester I and II. The examination for the semester – I shall be held in the month of November/December and for the semester – II in the month of May/June or on such other dates as may be fixed by the Academic Council.
- The course will be considered as a minor course.
- Since it is a minor course, no lodging and boarding facilities will be provided by the University. However, depending upon the availability, the same may be considered.
- The outlines of tests and syllabi shall be such as prescribed by the Academic Council from time to time.

**2. ELIGIBILITY FOR ADMISSION:**

Graduate in any Subject.

**3. SCHEDULE FOR EXAMINATION FEES:**

- The last date by which admission forms and fees must reach the Registrar shall be as follows:

Semester	Without late fee	With late fee of Rs. 500/-	With late fee of Rs. 1000/-	With late fee of Rs. 5000/-	With late fee of Rs. 10000/-
Semester - I Regular and Re-appear Candidates (Nov/Dec)	Sept. 30	Oct. 15	Oct. 31	Up to 21 days before the commencement of the examination (written or practical whichever is earlier)	Up to ten days before the commencement of the examination (Written or practical whichever is earlier) with the approval of the Vice-Chancellor
Semester-II Regular and Re-appear Candidates (May/June)	Feb. 28	Mar. 15	Mar. 31	-do-	-do-

- (a) Candidates will be required to pay examination fees for each semester as prescribed by the University from time to time.
- (b) Candidates shall submit their application forms for admission to the examination duly countersigned by Head of the Department/Principal of the concerned College.

**4. MEDIUM OF EXAMINATION:**

The medium of examination and instructions shall be English only.

**5. EVALUATION:**

- (a) In each theory paper 20% of the total marks are assigned to the continuous assessment and 80% marks to the University examination and in each practical paper 60% of the total marks are assigned to the continuous assessment and 40% marks to the University examination.
- (b) The minimum number of marks required to pass the examination shall be 35% in internal assessment as well as University Examination in each
- (c) When a candidate has failed or placed under "reappear" in the University examination but passes in the continuous assessment, the marks in the continuous assessment shall be carried for subsequent examinations.
- (d) If a candidate has failed or placed under "reappear" in the continuous assessment, but passes in the University examination, the marks in the University examination shall be carried for subsequent examination. In that case, the candidate will have to improve his/her score in continuous assessment by taking only a single test which will consist of 20% of total marks for theory papers and 60% for practical papers. Such candidate will have to inform the Head of the Department/Principal of the College in writing and in turn the test will be scheduled by the Department/College.

**6. MINIMUM REQUIREMENTS TO CONTINUE THE PROGRAMME:**

- (a) A candidate shall be allowed to join **Second Semester** provided that he/she has undergone a regular course of studies of first semester as provided under the regulations and fulfils the conditions as laid in the ordinance 5(a) and 5(b)
- (b) A candidate who fails in not more than three papers may be declared 're-appear' in those papers and may be permitted to 're-appear' in those papers at a subsequent examination within two chances.
- (c) If a candidate fails in more than three papers, he/she will be declared 'fail'. If such candidate has taken provisional admission to the next semester before the declaration of the result of the previous semester, his/her admission shall be cancelled immediately on declaration of the result of previous semester. He/She will have to clear the examination as a private candidate along with the regular students as and when the examination for the same is held by the University.

**7. ELIGIBILITY FOR FIRST SEMESTER EXAMINATION:**

The first semester examination shall be open to a student who satisfies 7(a) and 7(b) below:

- (a) Who has passed the Bachelor's degree in any discipline from a statutory University.
- (b) Satisfies the following requirements
  - i. who has been on the rolls of the Department/College throughout the Semester preceding the examination.
  - ii. Every candidate will be required to attend 75% attendance of the delivered lectures in each paper.  
Teaching/Seminars/Tutorial/Guided Library Reading Period of 1 hour's duration  
*-1 attendance*  
Practical one period-may be of 2-3 Hours duration *-1 attendance*
  - iii. In case of students, whose names are struck off on account of non-payment of fee, their periods, for the time they were not on the rolls, shall not be accounted for.
  - iv. The *shortage in attendance* of lectures by the candidate will be condoned as per rules made by the University from time to time. However it will be compulsory for a candidate that he/she has attended at least 60% prescribed number of periods.
  - v. has completed the prescribed course of instructions for the examination, but has not appeared or having appeared has failed and has been

recommended by the Head of the Department, for admission to such examination as a late Department student without attending a fresh course of instructions (Theory and Practical) within a period of two year from the date of completion of the course.

**8. ELIGIBILITY FOR SECOND SEMESTER EXAMINATION:**

Semester II examination shall be open to a student who has passed the previous examination or fulfils the conditions provided in ordinance 6 and satisfies the requirements as provided in ordinance 7(b) i. and ii. above.

**9. DECLARATION OF RESULTS:**

Three weeks after the termination of examination or as soon thereafter as possible, the Registrar shall publish the result of the candidates. Each candidate shall receive a certificate indicating details of marks obtained in each examination. Successful candidates at the end of final examination shall receive a **"Post Graduate Diploma in Computer Applications"** stating the division according to ordinance 11.

**10. GRACE MARKS:**

The grace marks shall be allowed according to the ordinance relating to "Award of Grace Marks" as per University rules.

**11. AWARD OF DIVISION AND DISTINCTION:**

The successful candidates shall be classified on the basis of aggregate marks secured in Semester I and II taken together as under:

- (a) 75% or more in First division with Distinction.
- (b) 60% or more but less than 75% in the First division.
- (c) 50% or more but less than 60% in the Second division.
- (d) 40% or more but less than 50% in the Third division.

There will be no relative ranking system.

## **OUTLINE OF PAPERS AND TESTS**

### **for P.G.D.C.A.– First Semester**

<b>Code</b>	<b>Title of Paper</b>	<b>University Examination</b>	<b>Continuous Assessment</b>	<b>Max. Marks</b>	<b>Exam. Duration Hours</b>
PGDCA-101	Fundamentals of Information Technology	80	20	100	3
PGDCA-102	Operating Systems	80	20	100	3
PGDCA-103	Programming Fundamentals through "C" Language	80	20	100	3
PGDCA-104	Computer Organization and Architecture	80	20	100	3
PGDCA-105	Software Lab – I Office Automation and Productivity Tools	40	60	100	3
PGDCA-106	Software Lab – II Programming Fundamentals through "C" Language	40	60	100	3
		<b>400</b>	<b>200</b>	<b>600</b>	

**Note:**

1. The break up of marks for the Continuous assessment for theory papers will be as under:
  - i. One or two tests out of which minimum one best will be considered for assessment. 15 Marks
  - ii. Attendance, Class participation and behaviour 5 Marks
  
2. The break up of for the Continuous Assessment for the practical will be as under:
  - i. Two or three tests out of which minimum two will be considered for evaluation (60% of Total marks) 36 Marks
  - ii. Lab Assignments (30% of Total marks) 18 Marks
  - iii. Attendance/Class participation and behaviour (10 % of Total marks) 6 Marks

## **OUTLINE OF PAPERS AND TESTS**

### **for P.G.D.C.A. – Second Semester**

<b>Code</b>	<b>Title of Paper</b>	<b>University Examination</b>	<b>Internal Assessment</b>	<b>Max. Marks</b>	<b>Exam. Duration Hours</b>
PGDCA-201	Data Structures	80	20	100	3
PGDCA-202	Object Oriented Programming with C++	80	20	100	3
PGDCA-203	Database Management System with MS ACCESS	80	20	100	3
PGDCA-204	Fundamentals of Computer Networks, Internet and Scripting Languages	80	20	100	3
PGDCA-205	Software Lab – III Data Structures and Programming with C++	40	60	100	3
PGDCA-206	Software Lab – IV MS ACCESS and Scripting Languages	40	60	100	3
		<b>400</b>	<b>200</b>	<b>600</b>	

**Note:**

1. The break up of marks for the Continuous assessment for theory papers will be as under:
  - i. One or two tests out of which minimum one best will be considered for assessment. 15 Marks
  - ii. Attendance, Class participation and behaviour 5 Marks
  
2. The break up of for the Continuous Assessment for the practical will be as under:
  - i. Two or three tests out of which minimum two will be considered for evaluation (60% of Total marks) 36 Marks
  - ii. Lab Assignments (30% of Total marks) 18 Marks
  - iii. Attendance/Class participation and behaviour (10 % of Total marks) 6 Marks

## PGDCA-101 Fundamentals of Information Technology

Maximum Marks: **80**  
Minimum Pass Marks: **35 %**

Lectures to be delivered: **40-50**  
Time allowed: **3 Hrs.**

### A) Instructions for paper-setters

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

### B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non programmable scientific calculator is allowed.

### SECTION-A

**Historical Evolution of Computer:** Block Diagram 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:** Keyboard, Mouse, Joy tick, Track Ball, Touch Screen, Light Pen, Digitizer, Scanners, Voice Recognition Devices, Optical Recognition devices, Dot matrix, Character and Line printer, DeskJet printer, Laser printer, and plotters.

### SECTION-B

**Number System:** Non-positional and positional number systems, Base conversion, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other.

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

**Computer Codes:** weighted and non-weighted code, BCD, EBCDIC, ASCII, Unicode, XS-3, Grey Codes.

### SECTION-C

**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.

### SECTION-D

**Applications of Information Technology and Trends:** IT in Business and Industry, IT in Education & training, IT in Science and Technology, IT and Entertainment, Current Trends in IT Application - AI, Virtual Reports, voice recognition, Robots, Multimedia Technology.

**E-Commerce:** Meaning, its advantages & limitations, Infrastructure for E-commerce, Types of E-Commerce Applications. **Multimedia:** Concepts, Components and Application.

### Text Book:

1. P.K. Sinha and P. Sinha, Foundations of Computing, First Edition, 2002, BPB.

### References:

1. Chetan Srivastva, Fundamentals of Information Technology, Kalyani Publishers.
2. Turban Mclean and Wetbrete, Information Technology and Management, Second Edition, 2001, John Wiley & Sons.
3. Satish Jain, Information Technology, BPB, 1999.
4. Sukhmeen Kaur, Vikram Gupta, S. S. Hatia and Navneet Kaur, "Fundamentals of Information Technology", Kalyani Publishers.

## **PGDCA-102 Operating Systems**

Maximum Marks: **80**  
Minimum Pass Marks: **35 %**

Lectures to be delivered: **40-50**  
Time allowed: **3 Hrs.**

### **A) Instructions for paper-setters**

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

### **B) Instructions for candidates**

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non programmable scientific calculator is allowed.

### **SECTION-A**

**Introduction to operating System:** Definition, its need and Operating system services, Early systems, Introduction to various 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.

### **SECTION-B**

**Process Management:** Process concept, types of Process scheduling, Basic concept of CPU Scheduling, Scheduling criteria, and Scheduling algorithms: FCFS, SJF, Round Robin & Queue Algorithms, Deadlock definition and its characterization.

### **SECTION-C**

**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 Neighbour hood, system tools, Recycle bin, Files and directory management under windows, Running programs

### **SECTION-D**

**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

Unix Administration: Superuser, Booting, Backup, Creating and managing new accounts.

### **Text books:**

1. Rathbone, "Windows for dummies", Pustak mahal
2. Stan Kelly-Bootley, "Understanding UNIX", Sybex Tech asian edition
3. Silverschatz, "Operating system concepts", Pearson Education India.

## PGDCA-103 Programming Fundamentals through "C" Language

Maximum Marks: **80**  
Minimum Pass Marks: **35 %**

Lectures to be delivered: **40-50**  
Time allowed: **3 Hrs.**

### A) Instructions for paper-setters

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

### B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non programmable scientific calculator is allowed.

### SECTION-A

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

### SECTION -B

**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 -C

**Arrays:** Definition, accessing elements, initialization, passing to functions, multi dimensional arrays, strings

**Pointers:** address and referencing operators, declaration, assignment, passing pointer to functions, pointer arrays

### SECTION -D

**Structures:** variables, accessing members, nested structures, pointer to structures, self referential structures.

**Files in C:** Sequential files, random access files, Unformatted files, Text files, binary files.

### Text Book:

1. Byron Gottfried , "Programming with C, Second edition, Schaum' s outline series" TMH

### References:

1. Ram Kumar and Rakesh Aggarwal : Programming in Ansi C, TMH
2. B.W. Kerrighan and D.M.Richie, " The C programming language", 2<sup>nd</sup> edition, PHI
3. H.H. Tan & T.B. Dorazio," C Programming for engineers & Computer Science", Mcgraw Hill international edition.
4. Vikram Gupts and S. S. Bhatia, "Programming Fundamentals through C Language" Kalyani Publishers.

## PGDCA-104 Computer Organization and Architecture

Maximum Marks: **80**

Minimum Pass Marks: **35 %**

Lectures to be delivered: **40-50**

Time allowed: **3 Hrs.**

### A) Instructions for paper-setters

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

### B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non programmable scientific calculator is allowed.

### SECTION-A

**Boolean Algebra:** Boolean operations, Truth Tables, Boolean Laws, K-maps (2,3 and 4 variable maps, don't care conditions).

### SECTION -B

**Basic Gates, Combinational logic design:** half-adder, full adder, parallel adder.

**Sequential circuits:** concept, flip-flops (D, RS, JK, T), counters (Ripple, Asynchronous, Synchronous).

Instruction codes, Instruction formats, Instruction cycle, Addressing modes.

### SECTION -C

Register Transfer Language, Arithmetic, Logic and Shift micro-operations, Arithmetic Logic Shift unit

**Control Memory:** Design of control unit, Micro programmed and hardwired control unit (overview only), Features of RISC and CISC

### SECTION -D

**Memory Organisation:** memory hierarchy, Memory types: cache, associative and other types.

**I/O organization:** I/O interface, Modes of data transfer: Programmed I/O, Interrupt initiated I/O, DMA.

Block diagram depicting architecture of 8085 machine.

### Text Book:

1. M.M. Mano, "Computer System Architecture". Third Edition, Prentice-Hall of India, 2002.

### References:

2. A.S.Tannenbaum, "Structured Computer Organisation". Prentice-Hall of India, 1999.
3. William Stallings, "Computer Organisation and Architecture". 6<sup>th</sup> Edition, Pearson Education, 2002.

**PGDCA-105: Software Lab – I**  
**(Office Automation and Productivity Tools)**

Maximum Marks: \*  
Minimum Pass Marks: **35 %**

Lectures to be delivered: **40-50**  
Time allowed: **3 Hrs.**

This laboratory course will comprise as exercises based on Office Automation and Productivity Tools. Students are required to practice following:

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

**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.

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

**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.

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

**The break up of marks for the University examination will be as under**

<b>i.</b>	<b>Lab Record</b>	<b>10 Marks</b>
<b>ii.</b>	<b>Viva Voce</b>	<b>15 Marks</b>
<b>iii.</b>	<b>Task given in the examination/Program Development and Execution</b>	<b>15 Marks</b>

**PGDCA-106: Software Lab – II**  
**(Programming Fundamentals through "C" Language)**

Maximum Marks: \*

Minimum Pass Marks: **35 %**

Practical Unites to be conducted: **40-50**

Time allowed: **3 Hrs.**

This laboratory course will comprise as exercises to supplement what is learnt under paper PGDCA-103: Programming Fundamentals through "C" Language. Students are required to develop programs based upon:

1. Various data types in C language
2. Various constructs in the C language
3. REading writing text files.

\*Maximum Marks for continuous assessment : 60

Maximum Marks for University examination : 40

**The break up of marks for the University examination will be as under**

- |             |  |                 |
|-------------|--|-----------------|
| <b>i.</b>   | <b>Lab Record</b>  | <b>10 Marks</b> |
| <b>ii.</b>  | <b>Viva Voce</b>   | <b>15 Marks</b> |
| <b>iii.</b> | <b>Task given in the examination/Program Development and Execution</b> | <b>15 Marks</b> |

## PGDCA-201 Data Structures

Maximum Marks: **80**  
Minimum Pass Marks: **35 %**

Lectures to be delivered: **40-50**  
Time allowed: **3 Hrs.**

### A) Instructions for paper-setters

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

### B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non programmable scientific calculator is allowed.

### SECTION-A

Basic concept and notations, data structures and data structures operations, mathematical notation and functions, algorithmic complexity, Big 'O' notations and time space trade off.

**Arrays:** Linear array, representation of linear array in memory, Traversing linear array, insertion and deletion in an array, multi-dimensional array: row-major, column major order, sparse array.

### SECTION-B

**Stacks:** Push and Pop in stack. Representation of stack in memory (linked and sequential) applications of Stack: conversion from infix notation to post fix notations, evolution of postfix notation, matching of Parenthesis, recursion, Tower of Hanoi.

### SECTION-C

**Linked list:** representation of linked list using static and dynamic data structures, Comparison of Linear and non-linear data structures, Insertion and deletion of a node from a linear linked list, Introduction to doubly and circular linked lists, Application of linked lists.

### SECTION-D

**Searching and Sorting:** Linear and binary search, Bubble Sort, Insertion Sort, Selection Sort, Merge Sort, Radix Sort and Quick Sort comparison of various searching and sorting algorithms.

### Text Books:

1. Seymour Lipschutz "Theory & Practice of Data Structures", McGraw Hil, 1998
2. Thomas Naps and Bhagat Singh, Introduction to Data Structures.

## PGDCA-202 Object Oriented Programming with C++

Maximum Marks: **80**  
Minimum Pass Marks: **35 %**

Lectures to be delivered: **40-50**  
Time allowed: **3 Hrs.**

### A) Instructions for paper-setters

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

### B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non programmable scientific calculator is allowed.

### SECTION-A

**Evolution of OOP :** Procedure Oriented Programming, OOP Paradigm, Advantages and disadvantages of OOP over its predecessor paradigms. Characteristics of Object Oriented Programming.

**Introduction to C++ :** Identifier, Keywords, Constants, Operators: Arithmetic, relational, logical, conditional and assignment. Size of operator, Operator precedence and associativity. Type conversion, Variable declaration, expressions, statements, manipulators. Input and Output statements, stream I/O, Conditional and Iterative statements, breaking control statements.

### SECTION-B

Storage Classes, Arrays, Arrays as Character Strings, Structures, Unions, Bit fields, Enumerations and User defined types.

**Pointers :** Pointer Operations, Pointer Arithmetic, Pointers and Arrays, Multiple indirections, Pointer to functions. Functions: Prototyping, Definition and Call, Scope Rules. Parameter Passing: by functions, recursion, function overloading, Default Arguments, Const arguments, Pre-processor, Type casting.

### SECTION-C

**Classes and Objects :** Class Declaration and Class Definition, Defining member functions, making functions inline, Nesting of member functions, Members access control, this pointer, Objects: Object as function arguments, array of objects, functions returning objects, Const member.

Static data member and Static member functions, Friend functions and Friend classes.

**Constructors:** Properties, types of constructors, Dynamic constructors, multiple constructors in classes.

**Destructors:** Properties, Virtual destructors, Destroying objects, Rules for constructors and destructors.

Array of objects. Dynamic memory allocation using new and delete operators, Nested and container classes, Scopes: Local, Global, namespace and Class.

### SECTION-D

**Inheritance:** Defining derived classes, inheriting private members, single inheritance, types of derivation, function redefining, constructors in derived class, Types of inheritance, Types of base classes, Code Reusability.

**Polymorphism:** Methods of achieving polymorphic behavior. Polymorphism with pointers, virtual functions, late binding, pure virtual functions and abstract base class.

**Operator overloading:** over loading binary operator, overloading unary operators, rules for operator overloading, operator overloading using friend function. Function overloading: early binding.

Difference between function overloading, redefining, and overriding.

### Text Book:

1. Herbert Schildt. "The Complete Reference C++", Tata McGraw-Hill, 2001

**References:**

1. Deitel and Deitel, "C++ How to Program", Pearson Education, 2001
2. Robert Lafore, "Object Oriented Programming in C++", Galgotia Publications, 1994.
3. Bjarne Strastrup, "The C++ Programming Language", Addison-Wesley Publication Co., 2001.
4. Stanley B. Lippman, Josee Lajoie, "C++ Primer", Pearson Education, 2002
5. E. Balagurusamy, "Object Oriented Programming with C++", Tata McGraw-Hill, 2001.

## PGDCA-203 Database Management System with MS ACCESS

Maximum Marks: **80**  
Minimum Pass Marks: **35 %**

Lectures to be delivered: **40-50**  
Time allowed: **3 Hrs.**

### A) Instructions for paper-setters

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

### B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non programmable scientific calculator is allowed.

### SECTION-A

**Traditional file processing system :** Characteristics, limitations, Database : Definition, composition.

**Database Management System:** Definition, Characteristics, advantages over traditional file processing system, User of database, DBA and its responsibilities, Database schema, instance. DBMS architecture, data independence, mapping between different levels.

**Database languages:** DDL, DML, DCL.

Database utilities, Data Models, Keys: Super, candidate, primary, unique, foreign.

### SECTION-B

**Entity relationship model:** concepts, mapping cardinalities, entity relationship diagram, weak entity sets, strong entity set, aggregation, generalization, converting ER diagrams to tables. Overview of Network and Hierarchical model.

**Relational Data Model:** concepts, constraints. Relational algebra: Basic operations, additional operations.

### SECTION-C

**Database Design:** Functional dependency, decomposition, problems arising out of bad database design, normalization, multi-valued dependency, Database design process, data base protection, database integrity.

**Database concurrency:** Definition and problems arising out of concurrency.

**Database security:** Authentication, authorization, methods of implementing security.

### SECTION-D

**MS-ACCESS:** Introduction to MS-ACCESS, working with database 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. B.P. Desai, "Database management system" BPB publications, New Delhi.

### Reference:

1. C.J. Date, "An Introduction to Data Base Systems", 3rd Ed., Narosa Publishers, 1997
2. Jeffrey D. Ullman, "Principles of Database Systems", 2nd Ed., Galgotia Pub., 1984.
3. D. Kroenke., "Database Processing", Galgotia Publications, 1987.
4. Henry F. Korth, "Database System Concepts", McGraw Hill. Inc., 1997.
5. Naveen Prakash, "Introduction to Database Management", TMH, 1993.
6. Ivan Bayross, "Oracle 7 The complete reference", BPB Publications.
7. Bobrowsky, "Client server architecture and Introduction to Oracle 7", 1996
8. Elmsry Nawathy, "Introduction to database System", Pearson Education India.
9. Content Development Group "Working with MS-OFFICE 2000", TMH

## **PGDCA-204 Fundamentals of Computer Networks, Internet and Scripting Languages**

Maximum Marks: **80**

Minimum Pass Marks: **35 %**

Lectures to be delivered: **40-50**

Time allowed: **3 Hrs.**

### **A) Instructions for paper-setters**

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

### **B) Instructions for candidates**

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non programmable scientific calculator is allowed.

### **SECTION-A**

**Computer Networks:** Introduction, Applications, Network hardware and Software (protocol hierarchies, design issues for layers, interfaces and services: connection oriented and connection less), Network structure and architecture - point to point, multicast, broadcast, Classification of networks-LAN, MAN and WAN. Reference models - the OSI reference model, TCP / IP reference model. Comparison between OSI and TCP / IP models.

### **SECTION -B**

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

**Internet working:** How networks differ, concatenated virtual circuits, connectionless internetworking, tunnelling, internetwork Routing, fragmentation, Firewalls, internet architecture.

### **SECTION -C**

**Application layer:** The DNS Name Space, Electronic Mail, The World Wide Web, FTP: introduction, data transfer and distributed computation, Generalised File Transfer, The File Transfer Protocol.

**Network security:** Introduction to cryptography, substitution ciphers, transposition ciphers, one-time pads, two fundamental cryptographic principles.

### **SECTION -D**

**Scripting languages: HTML:** Introduction to HTML, HTML and the World Wide Web, HTML elements, basic structure elements of HTML, the two categories of body elements – block level and text level, creating HTML pages, viewing pages in different browsers, rule for nesting.

HTML tags, colours and fonts, formatting the body section, creating links, creating external links, creating internal links.

### **Text Book:**

1. Andrew S. Tanenbaum, "Computer Networks", Third Edition, PHI Publications, 1997.
2. B Forousan, Introduction to data communication and networking

### **References:**

3. Douglas E. Comer , "Computer Networks and Internets" 2nd Editon, Addison Wesley.
4. D. Bertseilas and R. Gallager, "Data Networks", 2nd Edition, Prentice Hall, 1992.

**PGDCA-205: Software Lab – III**  
**(Data Structures and Object Oriented Programming with C++)**

Maximum Marks: \*

Minimum Pass Marks: **35 %**

Lectures to be delivered: **40-50**

Time allowed: **3 Hrs.**

This laboratory course will comprise as exercises to supplement what is learnt under paper PGDCA-201: Data Structures and 203: Object Oriented Programming with C++. Students are required to develop programs

1. Based upon various constructs in the C++ language.
2. Searching and sorting algorithms in C++ language
3. Data structures like stack, queues and linked lists in C++ language.

\*Maximum Marks for continuous assessment : 60

Maximum Marks for University examination : 40

**The break up of marks for the University examination will be as under**

<b>i.</b>	<b>Lab Record</b>	<b>10 Marks</b>
<b>ii.</b>	<b>Viva Voce</b>	<b>15 Marks</b>
<b>iii.</b>	<b>Task given in the examination/Program Development and Execution</b>	<b>15 Marks</b>

**PGDCA-206: Software Lab – IV  
(Scripting Languages)**

Maximum Marks: \*

Minimum Pass Marks: **35 %**

Practical Unites to be conducted: **40-50**

Time allowed: **3 Hrs.**

This laboratory course will comprise as exercises to supplement what is learnt under paper PGDCA-203: Database Management System with MS ACCESS and PGDCA-204: Fundamentals of Computer Networks, Internet and Scripting Languages. Students are required to practices:

**MS ACCESS:** Creating tables, queries in MS Access, Applying integrity constraints, creating forms, sorting and filtering, creating reports.

**HTML:** Tables, Forms, Frames and other text formatting 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

**The break up of marks for the University examination will be as under**

<b>i.</b>	<b>Lab Record</b>	<b>10 Marks</b>
<b>ii.</b>	<b>Viva Voce</b>	<b>15 Marks</b>
<b>iii.</b>	<b>Task given in the examination/Program Development and Execution</b>	<b>15 Marks</b>