ORDINANCES
AND OUTLINES OF TESTS,
SYLLABI AND COURSES OF READING

FOR

POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS
(ANNUAL)

2015 & 2016 EXAMINATIONS

DEPARTMENT OF COMPUTER SCIENCE
J.S. University
Shikohabad

J. S. University Shikohabad (Firozabad)
ANNUAL
SYLLABUS

POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS (PGDCA)

Paper code	Title of the paper	External Examination (Max/Min)	Internal Assessment (Max/Min)	Total Marks
PGDCA-11	Introduction to Information Technology	80/27	20/8	100
PGDCA-12	Operating System	80/27	20/8	100
PGDCA-13	DBMS	80/27	20/8	100
PGDCA-14	Programming in C and data structure	80/27	20/8	100
PGDCA-15	Introduction to Computer Network and E-Commerce	80/27	20/8	100
PGDCA-16	Software Engineering	80/27	20/8	100
PGDCA-11P	Software Lab-I (DOS, Windows, Unix)	60/24	40/16	100
PGDCA-12P	Software Lab-II (MS-Office : Excel, Word, Power Point, MS-Access	60/24	40/16	100
PGDCA-13P	Software Lab-III (Programs to be implemented in C)	60/24	40/16	100
PGDCA-14P	Software Lab-IV (Web Designing, HTML and Other Scripting Languages)	60/24	40/16	100

PGDCA-11: INTRODUCTION TO INFORMATION TECHNOLOGY

Maximum Marks : **80** Lectures to be delivered : **40-50**
Minimum Pass Marks : **40** % 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: 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.

SECTION-B

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-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
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.

Text Books :
1. Vishal Goyal, Lalit Goyal, Pawan Kumar, A Simplified Approach to Data Structures, Shroff Publications.
2. Shubhnandan S. Jamwal, Programming in C, Pearson Publications.

References :

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-12 : Operating Systems

Maximum Marks : **80** Lectures to be delivered: **40-50**
Minimum Pass Marks : **40** % Time allowed : **3 Hrs.**

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.

SECTION-B

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-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 neighbourhood, 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.

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-13 : DBMS

Maximum Marks : **80** Lectures to be delivered : **40-50**
Minimum Pass Marks : **40** % 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: 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.

SECTION B

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 C

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,

SECTION D

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", Pearson Education India.

PGDCA-14: PROGRAMMING IN C & DATA STRUCTURE

Maximum Marks : **80** Lectures to be delivered: **40-50**
Minimum Pass Marks: **40** % 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
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.

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.
Linked lists: Array Implementation and Dynamic Implementation of Singly Linked Lists, Doubly Linked List, Circularly Linked List, Operations on a Linked List. Insertion, Deletion, Traversal

SECTION D

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.
4. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publications Pvt Ltd Delhi India.

PGDCA-15: INTRODUCTION TO COMPUTER NETWORK AND E-COMMERCE

Maximum Marks : **80** Lectures to be delivered: **40-50**
Minimum Pass Marks: **40** % 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: 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

SECTION - B

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 - C

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.

SECTION – D

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-16: SOFTWARE ENGINEERING

Maximum Marks : **80** Lectures to be delivered: **40-50**
Minimum Pass Marks: **40** % 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 Software Engineering, Software Components, 8 Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Software Quality Attributes. Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model.

SECTION B

Software Requirement Specifications (SRS): 8 Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modelling, Data Flow Diagrams, Entity Relationship Diagrams, Decision Tables, SRS Document, IEEE Standards for SRS.

SECTION C

Software Design & Testing: Basic Concept of Software Design, Architectural Design, 8 Low Level Design: Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, **Design Strategies:** Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design.

Testing Objectives, Unit Testing, Integration Testing, 8 Acceptance Testing, Testing for Functionality and Testing for Performance, Top-Down and Bottom-Up Testing Strategies: Test Drivers and Test Stubs, Structural Testing (White Box Testing), Functional Testing (Black Box Testing).

SECTION D

Software Maintenance and Software Project Management: 8 Software as an Evolutionary Entity, Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re-Engineering, Reverse Engineering. An Overview of CASE Tools. Estimation of Various Parameters such as Cost, Efforts, Schedule/Duration, Constructive Cost Models (COCOMO).

References:

1. R. S. Pressman, Software Engineering: A Practitioners Approach, McGraw Hill.
2. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
3. K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers.
4. Pankaj Jalote, Software Engineering, Wiley
5. Deepak Jain, ”Software Engineering: Principles and Practices”, Oxford University Press.

PGDCA-11P: Software Lab-I (DOS, Windows, Unix)

Maximum Marks	100 *	Practical Unites to be conducted 40-50	
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-12P: SOFTWARE LAB-II (MSOFFICE: EXCEL, WORD, POWERPOINT, and MS-ACCESS)

Maximum Marks	100 *	Practical Unites to be conducted 40-50	
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-13P: Software Lab-III (Programming to be implemented in C)

Maximum Marks 100 * Practical Unites to be conducted 40-50
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-14P: SOFTWARE LAB-IV (WEB DESIGNING, HTML AND OTHER SCRIPTING LANGUAGES)

Maximum Marks 100 * Practical Unites to be conducted 40-50
Minimum Pass marks : 40% Time allotted : 3 Hrs.

HTML: TABLES, FORMS, FRAMES AND OTHER TEXT FORMATING TAGS
DHATML: CASCADING STYLE SHEETS AND DOCUMENT OBJECT MODEL
JAVASCRIPT: INTRODUCTION TO JAVASCRIPT.

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