

NIELIT O Level

M1-R4: IT Tools and Business System

Session 1: Computer Appreciation

1. Characteristics of Computers, Input, Output, Storage units.
2. CPU, Computer System.
3. Binary number system, Binary to Decimal Conversion, Decimal to Binary Conversion.
4. ASCII Code, Unicode.

Session 2: Computer Organization

1. Central Processing Unit - Processor Speed, Cache, Memory, RAM, ROM, Booting.
2. Memory- Secondary Storage Devices: Floppy and Hard Disks, Optical Disks CD-ROM, DVD.
3. Mass Storage Devices: USB thumb drive. Managing disk Partitions, File System Input
4. Devices - Keyboard, Mouse, joystick, Scanner, web cam, Output Devices- Monitors.
5. Printers – Dot matrix, inkjet, laser, Multimedia- What is Multimedia, Text, Graphics, Animation, Audio, Images, Video.
6. Multimedia Application in Education, Entertainment, Marketing.
7. Names of common multimedia file formats.
8. Computer Software- Relationship between Hardware and Software.
9. System Software, Application Software, Compiler, names of some high level languages, free domain software.

Session 3: Operating System and Application Management

1. Microsoft Windows- An overview of different versions of Windows, Basic Windows elements, File management through Windows.
2. Using essential accessories: System tools, Disk cleanup, Disk defragmenter, Entertainment, Games, Calculator.
3. Imaging – Fax, Notepad, Paint, WordPad.
4. Command Prompt- Directory navigation, path setting, creating and using batch files.
5. Drives, files, directories, directory structure.
- 6. Application Management:** Installing, uninstalling, Running applications.
- 7. Linux-** An overview of Linux, Basic Linux.
8. Elements: System Features, Software Features, File Structure.
9. File handling in Linux: H/W, S/W requirements, Preliminary steps before installation, specifics on Hard drive repartitioning and booting a Linux system.

Session 4: Word Processing

1. Word processing concepts: saving, closing, Opening an existing document, Selecting text, Editing text.
2. Finding and replacing text, printing documents, Creating and Printing Merged Documents, Character and Paragraph Formatting, Page Design and Layout.
3. Editing and Profiling Tools: Checking and correcting spellings. Handling Graphics, Creating Tables and Charts, Document Templates and Wizards.

Session 5: Spreadsheet Package

1. Spreadsheet Concepts, Creating, Saving and Editing a Workbook.
2. Inserting, Deleting Work Sheets, entering data in a cell / formula Copying and Moving from selected cells, handling operators in Formulae.
3. Functions: Mathematical, Logical, statistical, text, financial, Date and Time functions, Using Function Wizard.
4. Formatting a Worksheet: Formatting Cells – changing data alignment, changing date, number.
5. Character or currency format, changing font, adding borders and colors, Printing worksheets.
6. Charts and Graphs – Creating, Previewing, Modifying Charts, Integrating word processor, spread sheets, web pages.

Session 6: Presentation Package

1. Creating, Opening and Saving Presentations, Creating the Look of Your Presentation.
2. Working in Different Views, Working with Slides, Adding and Formatting Text.
3. Formatting Paragraphs, Checking Spelling and Correcting Typing Mistakes, Making Notes Pages and Handouts.
4. Drawing and Working with Objects, Adding Clip Art and other pictures, Designing Slide Shows, Running and Controlling a Slide Show, Printing Presentations.

Session 7: Database Operations

1. Data Manipulation-Concept: Database, Relational Database, Integrity.
2. Operations: Creating, dropping, manipulating table structure.
3. Manipulation of Data: Query, Data Entry Form, Reports.

Session 8: Information Technology and Society

1. Indian IT Act, Intellectual Property Rights – issues.
2. Application of information Technology in Railways, Airlines, Banking, Insurance, Inventory Control, Financial systems, Hotel management, Education, Video games, Telephone exchanges, Mobile phones, Information kiosks, special effects in Movies.

M2-R4: Internet Technology and Web Design

Session 1: Introduction to Internet

1. Internet, Growth of Internet, Owners of the Internet.
2. Anatomy of Internet, ARPANET and Internet history of the World Wide Web.
3. Basic Internet Terminology, Net etiquette.
4. Internet Applications – Commerce on the Internet, Governance on the Internet, Impact of
5. Internet on Society – Crime on/through the Internet.

Session 2: TCP/IP Internet Technology and Protocol

1. Packet switching technology, Internet Protocols: TCP/IP, Router.
2. Internet Addressing Scheme: Machine Addressing (IP address), E-mail Addresses, Resources Addresses.

Session 3: Internet Connectivity

1. Connectivity types: level one, level two and level three connectivity.
2. Setting up a connection: hardware requirement, selection of a modem, software requirement, modem configuration.
3. Internet accounts by ISP: Telephone line options, Protocol options, Service options.
4. Telephone line options – Dialup connections through the telephone system, dedicated connections through the telephone system,
5. ISDN, Protocol options – Shell, SLIP, PPP, Service options – E-mail, WWW, News Firewall etc.

Session 4: Internet Network

1. Network definition, Common terminologies: LAN, WAN, Node, Host, Workstation, bandwidth, Interoperability.
2. Network administrator, network security, Network Components: Servers, Clients.
3. Communication Media, Types of network: Peer to Peer, Clients Server.
4. Addressing in Internet: DNS, Domain Name and their organization, understanding the Internet Protocol Address.
5. Network topologies: Bust, star and ring, Ethernet, FDDI, ATM and Intranet.

Session 5: Services on Internet (Definition and Functions)

1. E-mail, WWW, Telnet, FTP, IRC and Search Engine.

Session 6: Electronic Mail

1. Email Networks and Servers, Email protocols –SMTP, POP3, IMAp4, MIME6.
2. Structure of an Email – Email Address, Email Header, Body and Attachments.
3. Email Clients: Netscape mail Clients, Outlook Express, Web based E-mail.
4. Email encryption- Address Book, Signature File.

Session 7: Current Trends on Internet

1. Languages, Internet Phone, Internet Video, collaborative computing, e-commerce.

Session 8: Web Publishing and Browsing

1. Overview, SGML, Web hosting, HTML, CGL, Documents Interchange Standards.
2. Components of Web Publishing, Document management.
3. Web Page Design Consideration and Principles.
4. Search and Meta Search Engine, WWW, Browser, HTTP, Publishing Tools.

Session 9: HTML Programming Basics

1. HTML page structure, HTML L Text, HTML links, HTML document tables, HTML Frames, HTML Images, multimedia.

Session 10: Interactivity Tools

1. ASP, VB Script, JAVA Script, JAVA and Front Page, Flash.

Session 11: Internet Security Management Concepts, Information Privacy and Copyright Issues

1. Overview of Internet Security.
2. Firewalls, Internet Security.
3. Management Concepts and Information Privacy and Copyright Issues, basics of a symmetric cryptosystems.

M3-R4: Programming and Problem Solving Through “C” Language

Session 1: Introduction to Programming

1. The Basic Model of Computation, Algorithms, Flow-charts.
2. Programming Languages, Compilation, Linking and Loading, Testing and Debugging, Documentation.

Session 2: Algorithm for Problem Solving

1. Exchanging values of two variables, summation of a set of numbers.
2. Decimal Base to Binary Base conversion, Reversing digits of an integer.
3. GCD (Greatest Common Division) of two numbers, Test whether a number is prime, Organize numbers in ascending order.
4. Find square root of a number, factorial computation, Fibonacci sequence, Evaluate ‘sin x’ as sum of a series.
5. Reverse order of elements of an array, Find largest number in an array.
6. Print elements of upper triangular matrix, multiplication of two matrices, Evaluate a Polynomial.

Session 3: Introduction to ‘C’ Language

1. Character set, Variables and Identifiers.
2. Built-in Data Types, Variable Definition.
3. Arithmetic operators and Expressions, Constants and Literals.
4. Simple assignment statement, Basic input/output statement, Simple ‘C’ programs.

Session 4: Conditional Statements and Loops

1. Decision making within a program, Conditions, Relational Operators.
2. Logical Connectives, if statement, if-else statement.
3. Loops: while loop, do while, for loop, Nested loops, Infinite loops, Switch statement, structured Programming.

Session 5: Arrays

1. One dimensional arrays: Array manipulation; Searching, Insertion, Deletion of an element from an array.
2. Finding the largest/smallest element in an array; Two dimensional arrays, Addition/Multiplication of two matrices.
3. Transpose of a square matrix; Null terminated strings as array of characters, Standard library string functions.

Session 6: Functions

1. Top-down approach of problem solving, Modular programming and functions.
2. Standard Library of C functions.
3. Prototype of a function: Formal parameter list, Return Type.
4. Function call, Block structure.
5. Passing arguments to a Function: call by reference, call by value, Recursive Functions, arrays as function arguments.

Session 7: Storage Classes

1. Scope and extent.
2. Storage Classes in a single source file: auto, extern and static, register.
3. Storage Classes in a multiple source files: extern and static.

Session 8: Structures and Union

1. Structure variables, initialization, and structure assignment.
2. Nested structure, structures and functions.
3. Structures and arrays: arrays of structures, structures containing arrays, unions.

Session 9: Pointers

1. Address operators, pointer type declaration, and pointer assignment.
2. Pointer initialization, pointer arithmetic, functions and pointers,.
3. Arrays and Pointers, pointer arrays, pointers and structures.
4. Dynamic memory allocation.

Session 10: Self Referential Structures and Linked List

1. Creation of a singly connected linked list, Traversing a linked list, Insertion into a linked list, Deletion from a linked list.

Session 11: File Processing

1. Concept of Files, File opening in various modes and closing of a file, Reading from a file, writing onto a file.

Recommended Books

1. Byron S Gottfried “Programming with C” Second edition, Tata McGrawhill, 2007.
2. R.G. Dromey, “How to solve it by Computer”, Pearson Education, 2008.
3. Kanetkar Y, “Let us C”, BPB Publications, 2007.
4. Hanly J R & Koffman E.B, “Problem Solving and Program design in C”, Pearson Education, 2009.

M4-R4: Introduction to ICT Resources

Session 1: PC Assembly and Operation

1. Assembly and Disassembly of PC and its various Parts, Startup Process (Booting).
2. BIOS Setup, CMOS Setup and meaning of its various setting.
3. Installation of Windows XP operating System, Installation of Other Software Packages such as Ms Office etc. Operation of Printer.
4. Installation of printer driver, Backup and Restore Operations Troubleshooting PC Problems.

Session 2: Utilities

1. Compression Utilities: WinZip, PKZIP, Concept of compression.
2. Defragmenting Hard, disk using defrag, Scan Disk for checking disk space, lost files and recovery.
3. Formatting Hard disk, Floppy Disk, Setting System Date and Time, Antivirus Package CD Writing Software – Nero etc.

Session 3: Networking Concept

1. What is Networking, Local Area Networking (LANs), Metropolitan Area Network (MAN), Wide Area Network (WAN).
2. Networking Topologies, Transmission media & method of communication.
3. Cabling: straight through and cross over, Study of components like switches, bridges, routers, Wi-Fi router etc.
4. Communication Protocols, TCP/IP, IP addressing, MAC address, Sub netting.

Session 4: Network Administrator

1. Installing and configuring the network using Windows NT based System.
2. Administration of Windows NT based network.
3. Creation of user and groups, File Sharing, Printer Sharing.

Recommended Books

1. Scott and Mueller, “Upgrading and Repairing PCs”, Techmedia, New Delhi.
2. Troubleshooting, Maintenance and Repairing PCs, Fifth Edition, by Stephen J. Bigelow, Tata McGraw- Hill Publishing Company Limited, New Delhi.
3. PC Upgrade and Maintenance Guide, 15th Edition, by Marks Minasi, BPB Publications.
4. Basic of Networking. ”NIIT “, Prentice, Hall of India Private Limited.
5. Networking Protocols and Standards. ”NIIT “, Prentice, Hall of India Private Limited.
6. William Stallings, “Data and Computer Communication”, Prentice, Hall of India Private Limited.