

## BCA 101 FUNDAMENTALS OF MATHEMATICS

Set, Relation and Functions: Set, Cartesian product of sets, relations, functions, binary operations.

Trigonometric Functions: Angles, trigonometric functions and trigonometric identities.

Cartesian system of rectangular coordinates: The number plane, distance formula area of a triangle, section formulae, slope of a line, locus and equation.

Straight line: To find equation of a straight line parallel to an axis: the point slope form, two point form, intercept form, slope-intercept form, normal form, condition of concurrency for three straight lines, analytical proof of geometric theorems.

Circle and family of circles: Standard form of equation of a circle, its general form, condition of tangency.

Quadratic equation : Solution of quadratic equations, symmetric functions of roots.

Determinants and Matrices: Properties and applications, definition and type of matrices, elementary transformation of a matrix, inverse of a matrix, normal form of a matrix, orthogonal matrices.

## BCA 102 PROGRAMMING WITH C

Program Concept, Characteristics of Programming, Various stages in Program Development Programming aids Algorithms, Flow Charts - Symbols, Rules for making Flow chart, Types of flowchart, Advantage & Disadvantage, Pseudocodes, Decision Table, Programming techniques & tools Programming Techniques Top down, Bottom up, Modular, Structured - Features, Merits & Demerits, Comparative study, Programming Logic- Simple, Branching, Looping, Recursion, Cohesion & Coupling, Programming Testing & Debugging & their Tools .

Introduction & features of C, Structure of C program, Variables, Expressions, Identifiers, Keywords, Data Types, Constants,

Operator and expression Operator: Arithmetic, Logical, Relational, Conditional and Bit wise Operators, Precedence and Associativity of Operators, Type conversion in expression, Basic input/output and library functions Single character input/output i.e. getch(), getchar(), getche(), putchar(), Formatted input output i.e. printf() and scanf(), Library functions - concepts, Mathematical & Character functions.

If statement, If.....Else statement, Nesting of If....Else Statement, else if ladder, The ?: operator, goto statement, Switch statement, Compound statement, Loop controls, for, while, do-while loops, break, continue, goto statement, ARRAYS Single and Multi Dimensional arrays, Array declaration and initialization of arrays, Strings : declaration, initialization, functions.

The need and form of C functions, User defined and library function, Function arguments, Return values and nesting of function, Recursion, Calling of functions, Array as function argument, Scope and life of variables - local and global variable, Storage class specified - auto, extern, static, register.

*Defining structure, Declaration of structure variable, Accessing structure members, Nested structures, Array of structure, Structure assignment, Structure as function argument, Function that return structure, Union, pointers, working with text files.*

## **BCA 103 INTERNET TECHNOLOGY**

Internet: Evolution, Concepts, Internet Vs Intranet, Growth of Internet, ISP, ISP in India, Types of connectivity - Dial-up, Leased line, DSL, Broadband, RF, VSAT etc., Methods of sharing of Internet connection, Use of Proxy server. Internet Services USENET, GOPHER, WAIS, ARCHIE and VERONICA, IRC

WORLD WIDE WEB (WWW) - History, Working, Web Browsers, Its functions, URLs, web sites, Domain names, Portals. Concept of Search Engines, Search engines types, searching the Web, Web Servers, TCP/IP and others main protocols used on the Web. E-Mail: Concepts, POP and WEB Based E-mail, merits, address, Basics of Sending & Receiving, E-mail Protocols, Mailing List, Free E-mail services, e-mail servers and e-mail clients programs.

Concepts of Hypertext, HTML introduction, features, uses & versions Using various HTML tags, Elements of HTML syntax, Head & Body Sections, , Inserting texts, Text alignment, Using images in pages, Hyperlinks text and images, bookmarks, Backgrounds and Color controls, creating and using Tables in HTML, and presentation, Use of font size & Attributes, List types and its tags. Cascading Style sheets defining and using simple CSS. Design tools for HTML, Overview of MS FrontPage, Macromedia Dream weaver, and other popular HTML editors, designing web sites using MS FrontPage (using at least FrontPage 2000) Use of Frames and Forms in web pages, Image editors, Issues in Web site creations & Maintenance,

E - Commerce An introductions, Concepts, Advantages and disadvantages, Technology in E- Commerce, Internet & E-business, Applications, Feasibility & various constraints. E-transition challenges for Indian corporate, the Information Technology Act 2000 and its highlights related to e-commerce.

Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, Digital Token-Based Electronic Payment Systems, Smart Cards and Electronic Payment Systems, Credit Card-Based Electronic Payment Systems, Risk and Electronic Payment Systems. E-security Security on the internet, network and web site risks for e-business, use of firewalls, secure physical infrastructure.

## **BCA 104 FUNDAMENALS OF COMPUTERS**

Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers-Analog, Digital, Hybrid, General, Special Purpose, Micro, Mini, Mainframe, Super, Generations of computers, Personal Computer (PCs) - IBM PCs, characteristics, PC/PCXT/PCAT - configurations, Pentium and Newer PCs specifications and main characteristics. Types of Pcs- Desktop, Laptop, Notebook, Palmtop, Workstations etc. their characteristics. Basic components of a computer system - Control unit, ALU, Input/Output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory.

Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor - Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers, Storage fundamentals - Primary Vs Secondary Data Storage and Retrieval methods - Sequential, Direct and Index Sequential, Various Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive.

Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Operating Systems - Functions, Types- Batch, Single, Multiprogramming, Multiprocessing, Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications of each of them, Virus working principles, Types of viruses, virus detection and prevention, viruses on network.

Analog and Digital Signals, Modulations - Amplitude Modulation (AM), Frequency Modulation (FM), Phase Modulation (PM), Communication Process, Direction of Transmissions Flow - Simplex, Half Duplex, Full Duplex, Communication Software, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Modem - Working and characteristics, Types of Connections - Dialup, Leased Lines, ISDN, Types of Network - LAN, WAN, MAN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN -Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways, Use of Communication in daily life.

Introduction, History & versions of DOS. DOS basics- Physical structure of disk, drive name, FAT, file & directory structure and naming rules, booting process, DOS system files, DOS commands. Internal - DIR, MD, CD, RD, COPY, DEL, REN, VOL, DATE,

TIME, CLS, PATH, TYPE etc, External - CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB, HELP, SYS etc. Executable V/s Non executable files in DOS.

## BCA 105 DIGITAL LOGIC

Logic Gates, AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates, Boolean Algebra, Basic Boolean Law's, Demorgan's theorem, MAP Simplification, Minimization techniques, K -Map, Sum of Product & Product of Sum

Data types and Number systems, Binary number system, Octal & Hexa-decimal number system, 1's & 2's complement, Binary Fixed-Point Representation, Arithmetic operation on Binary numbers, Overflow & underflow, Floating Point Representation, Codes, ASCII, EBCDIC codes, Gray code, Excess-3 & BCD, Error detection & correcting codes

Combinational & Sequential circuits, Half Adder & Full Adder, Full subtractor, Flip-flops - RS, D, JK & T Flip-flops, Shift Registers, RAM and ROM, Multiplexer, Demultiplexer, Encoder, Decoder, Idea about Arithmetic Circuits, Program Control, Instruction Sequencing

I/O Interface, Properties of simple I/O devices and their controller, Isolated versus memory-mapped I/O, Modes of Data transfer, Synchronous & Asynchronous Data transfer, Handshaking, Asynchronous serial transfer, I/O Processor

Auxiliary memory, Magnetic Drum, Disk & Tape, Semiconductor memories, Memory Hierarchy, Associative Memory, Virtual Memory, Address space & Memory Space, Address Mapping, Page table, Page Replacement, Cache Memory, Hit Ratio, Mapping Techniques, Writing into Cache

## BCA 106 ENVIRONMENTAL STUDIES

The multidisciplinary nature of environmental studies, Definition, scope and importance. Need for public awareness.

### Natural Resources

Renewal of non-renewable resources: Natural resources and associated problems.

- a). Forest resources: Use and over-exploration, deforestation, mining and their effects on forest and tribal people.
- b). Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, benefits and problems.
- c). Mineral resources: Use and exploitation, environmental effects of extracting and using minerals resources.
- d) Food resources: World food problem, changes caused by Agriculture and overgrazing, effects of modern agriculture, Fertilizer-pesticide problems.
- e). Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy source.
- f). Land resource: Land as a resource, land degradation, soil erosion and desertification.

### Conservation of Natural Resources

Equitable use of resources for sustainable development.

### Ecosystem

Concept of Ecosystem, structure and function of an ecosystem, Producers, consumers and decomposers. Energy flow in the ecosystem. Food Chains, food webs and ecological pyramids. Introduction types, characteristics features, structure and function of following ecosystems:

- a). Forest ecosystem
- b). Desert ecosystem
- c). Aquatic ecosystem (Ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity and its conservation: Introduction-Definition : genetic, species and ecosystem diversity. Value of biodiversity:

consumptive use, productive use, social, ethical, aesthetic and opinion values.

Biodiversity at global, national and local levels. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Important Endangered and endemic species of India.

Environmental Pollution: Definition, causes, effects and control measures of:

- a). Air Pollution
- b). Water Pollution
- c). Soil Pollution
- d). Noise Pollution
- e). Thermal Pollution
- f). Nuclear Hazards

Soil water Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Role of NGOs.

### BCA 107 HTML LAB

1. Design a simple HTML document using basic elements like:
2. `<HTML>`, `<body>`, `<head>`, `<title>`, `<br>`, `<hr>`.
3. Design a HTML document which show the use of following Text formatting tag:
4. `center`, `sup`, `em`, `ins`, `sub`, `font`, `h1` to `h6`.
5. Design a HTML document to demonstrate all computer output tag:
6. `code`, `kbd`, `samp`, `tt`, `var`, `pre`, `listing`, `xmp`.
7. Design a HTML document which demonstrate the use of following tag: `abbr`, `acronym`, `address`, `bdo`, `blockquote`, `q`.
8. Apply these character entities in your HTML document:
9. Non-breaking space
  - a. `&nbsp;`
  - b. `&gt;`
  - c. `&quot;`

- d. &
- e. ,
- 10. Demonstrate how to create a link in an HTML document.
- 11. Demonstrate how to use an image as a link in HTML document.
- 12. Demonstrate how to link to another page by opening a new window...
- 13. Demonstrate how to use a link to jump to another part of same document.
- 14. Demonstrate how to make a vertical and horizontal frameset with three different documents.
- 15. Design a HTML document which does not allow a user to resize frame.
- 16. Demonstrate how to make a navigation frame. This navigation frame contains a list of links with the second frame as the target.
- 17. Design a HTML document which shows how to jump to a specified section in a frame.
- 18. Design a HTML document having
- 19. Colored background table.
- 20. Table having image in background.
- 21. Colored background cell.
- 22. Table having image in only one cell.
- 23. Demonstrate how to use the "frame" attribute (with values like: box, void, above, below, hside, vside, lhs, rhs) and border attribute to control the borders around the table.

### BCA 108 C PROGRAMMING LAB

- 1. Write a program to show the use of arithmetic operations and library functions in evaluating expressions.
- 2. Write a program to show the use of Input Output statement.
- 3. Write a program to show the use of if else statement.
- 4. Write a program to show the use of switch statement.
- 5. Write a program to show the use of one dimensional and multi dimensional arrays.



6. Write a program to show the use of while statement.
7. Write a program to show the use of Do while statement.
8. Write a program to show the use of for statement.
9. Write a program to show the use of functions.
10. Write a program to show the use of recursion.
11. Write a program to define and use a structure.
12. Write a program to manipulate strings.

### BCA 109 MS OFFICE LAB

1. Write a paragraph in MS-Word and show the use of various tools.
2. Write an application & copy it to another document and differentiate between paste and paste special.
3. How to Insert a picture or chart in a document and reference it to another document?
4. Write a paragraph in MS-Word of 12 lines and Explain these Formatting tools:-
  - Columns.
  - Drop cap.
  - Paragraph.
  - Alignment.
  - Bullet and Numbering.
  - Tab Setting.
5. What is mail merge? How to use this facility? Describe it Step by Step.
6. Create a Student Table( Rno, Name, Fname, Class, Address, Phone and insert 5 records in it.
7. To study various charts and their implementations using a marksheet of 10 students.
8. Create a salary statement of an organization of 10 employees using if condition ( S.no. , Name, Designation, Basic, Da, Hra, total, net salary)

9. What is a pivot table? How to create and use a pivot table?
10. Create a power point presentation to present your institution detail, create at least 7 slides with different animation effect.
11. Create a power point presentation on "destination India" using images from clipart.
12. Create a power point presentation on "youth icon of India" and show the following
13. Custom Animation.
14. Compare and Merge Presentations.
15. Slide Design.
16. Cascade.

### **BCA 110 DIGITAL ELECTRONICS LAB**

1. Verify various logic gates : NOT, AND, OR, NAND, NOR, XOR AND XNOR
2. Verify various Boolean Laws
3. Verify NAND gate as Universal Gate
4. Verify NOR gate as Universal Gate
5. Realize Half Adder and Half-Subtractor Circuit.
6. Realize Full Adder and Full-Subtractor Circuit.
7. Realize BCD to Seven segment Decoder
8. Realize RS Flip flops using NAND and NOR gates.
9. Realize D flip flops using NOR and NAND gates.
10. Realize JK Flip Flop using gates.
11. Realize JK Flip Flop using IC.
12. Realize 3 bit ripple up counter
13. Realize 3 bit ripple down counter
14. Realize mod-5 counter
15. Realize mod-10 counter