

COMPUTER EDUCATION & CYBERNETICS

Mingy Developer

C language : 6500/-
C ++ : 7000/-
static web page design[swpd] : 7000/-
dynamic web page design[dwpd] : 7000/-
Python : 8000/-
Core java : 8000/-
= ~~43500~~
= 42000

Mingy Programmer

C language : 6500/-
C++ : 7000/-
Python : 8000/-
Core Java : 8000/-
= ~~29500/-~~
= 28000/-

C LANGUAGE

1. Basic C

- what is programming ? Why we need to learn programming ?
- History of C language
- Flowchart and Algorithm, Pseudo code.
- Compiler and Text Editor
- Installing IDE TURBO or other IDEs.
- Features and Application of C language
- Compilation and Execution of C program
- Structure of C program.
- Create First C program(HELLO WORLD)

2. Data Types & I/O functions

- C character set
- Tokens , Identifiers , Keywords , Comments
- Data Types
 - Primary data type
 - derived data type
 - user defined data type
- Format specifiers
- Variables & constants
- Enumerated Data type
- Storage classes
- Header files & user defined header file
- Introduction to I/O Functions
 - Formatted I/O functions
 - Un-formatted I/O functions

3. Operands & operators

- Operands & operators
- Binary Operators
 - Arithmetic Operators
 - Relational Operators
 - Logical Operators
 - Bitwise Operators
 - Assignment Operators
 - Other operators
- Unary operators
 - pluse(+)
 - minus(-)

- increment(++) operator
- decrement(--) operator
- Ternary operator
 - ()?: operator
- Operator Precedence and Associativity
- Evaluation of Expression

4. Control Statements

- Decision making statement
 - If
 - if ... else
 - else If ladder
 - Nested if else
- Iteration control statement
 - while loop
 - do ... while loop
 - for loop
 - nested loop
- Selection control statement
 - switch
 - nested switch
 - ()?: operator
- Flow control statement
 - break
 - goto
 - return
 - continue
 - exit

5. Array

- Understanding array
- array declaration, initialization, accessing elements
- Application of array.
 - Sorting array
 - search in array
 - min,max,sum as well as other logical operation on array
- 2nd-dimension , 3rd-dimension & Nth Dimension

6. String : array of character

- Understanding string & declaration & Initialization
- operations on string
 - strlen()
 - strcmp()
 - strlwr()
 - strchr()
 - strupr()
 - strstr()
 - strcat()
 - strrev()
 - strcpy()
 - strset()

- Array of string

7. Function : the group of statement

- Understanding function
- function prototype & definition
- Types of function prototype
 - without argument and without return value
 - with argument and without return value
 - without argument and with return value
 - with argument and with return value
- function calls
 - call by value
 - call by pointer
- Recursion
- passing array & string to function

8. Pointers

- Introduction to Pointers
- Pointer Declaration & initialization
- Pointers arithmetic
- pointers & array
- Array of pointers
- pointers & function

9. Structure & union

- Structure
 - introduction of structure
 - declaration , initialization of structure
 - accessing members of structure
 - Application of structure
 1. structure & function
 2. structure & array
 3. structure & pointers
- Union
 - introduction of union
 - declaration , initialization of Union
 - accessing members of union
- Structure vs Union

10. FILE Handling

- Understanding File handling
- File Modes
 - r
 - w
 - a
 - r+
 - w+
 - a+
- File handling functions

• fopen()	• fputc()	• fseek()
• fclose()	• fgetc()	• ftell()
• fprintf()	• fputw()	• rewind()
• fscanf()	• fgetw()	

11. DMA & linked list

- Dynamic memory allocation
 - Understanding Dynamic Memory Allocation
 - DMA functions

1. malloc()	3. realloc()
2. calloc()	4. free()
- linked list
 - Understanding linked list
 - Operations on linked list

1. insertion	3. searching
2. deletion	4. display
- Types of linked list
 - single linked list
 - circular linked
 - Double linked list

12. Pre-processor

- User-defined header file
- #define, #undef
- #define as macro
- conditional : {#if, #else, #elif, #endif, #ifdef, #ifndef}
- #errors

1. Programming

- What is programming?
- POP vs OOP programming.
- OOP's Concepts.
 - Class & objects.
 - Abstraction.
 - Encapsulation
 - Inheritance.
 - Polymorphism.
- C++ programming and it's Features

2. Basics of C++

- Basic structure of C++ programming
- Tokens in programming language.
- Types of Token:
 - Keywords
 - What is keywords and list of keywords in c++
 - Identifiers
 - what is identifier
 - rules to define identifiers.
 - Variables.
 - Constants
 - Define constants in C++
 - constant vs Variable.
 - Strings
 - char [] vs string class
 - special symbols
 - All printable characters and symbols
 - Operators
 - Expression with Operator and its Types.
- Data Types
 - Build-in Data Type
 - User defined Data Type
 - derived data type

3. Input/output in C++

- Header files
- input/output objects
 - [cout,cin]
- error msg
 - [cerr and clog]
- Type casting
 - Implicit type casting
 - explicit type casting

4. Operators and control statements

- Operators and operands
 - Types of operators
 - Arithmetic operators
 - Relational operators
 - Logical operators
 - Bitwise operators
 - Assignment Operators
 - precedence and associativity
- Conditional statements

<ul style="list-style-type: none"> • if statement • if-else statement • else if ladder statement • nested if statement 	<ul style="list-style-type: none"> ➤ switch statement ➤ range switch ➤ nested switch statement ➤ Ternary Operator(?:)
--	---
- Iteration Statements

<ul style="list-style-type: none"> • for loop • while loop 	<ul style="list-style-type: none"> • do while • nested loops
--	--
- Flow control statement

<ul style="list-style-type: none"> • Break • continue 	<ul style="list-style-type: none"> • return • exit 	<ul style="list-style-type: none"> • goto
---	--	--

5. Array : the collection of data

- What is array
- Types of Array

- One dimension array
- multi-dimension array
- character array
- Sorting and searching elements

6. OOP's Concepts

- Class and Object
- Constructor
 - default constructor
 - parameterized constructor
 - copy constructor
- destructor
- Abstraction
- Encapsulation
- Inheritance
 - Single inheritance
 - multilevel inheritance
 - multiple inheritance
 - hierarchical inheritance
 - hybrid inheritance
 - diamond problem
- Polymorphism
 - compile time
 - run time

7. Functions The group of statements

- Function prototype
- Type of functions
 - Without return value, without arguments
 - Without return value, with arguments
 - With return value, without arguments
 - With return value, with arguments
- Function calls
 - call by value
 - call by reference

- call by Pointer
- recursion

8. Structure & Unions

- Structure
 - structure variable [object of structure]
 - nested structure
 - structure array
 - function with structure
- Union
- structure vs Union

9. Pointers

- Pointers
- pointer arithmetic
- pointer with array
- array of pointer
- pointer to pointer

10. File management

- File classes
- File Modes
- File operation
 - file open/close
 - write/read file
 - appending content in file
- file flags

11. String the class

- String
- Char array as string [null terminated string]
- NULL terminated string functions
 - strlen()
 - strcpy()

- `strlwr()`
- `strupr()`
- `strcmp()`
- `strchr()`
- String class
- String class method
 - `append()`
 - `assign()`
 - `at()`
 - `begin()`
 - `capacity()`
 - `compare()`
- String operations
 - `strstr()`
 - `strrev()`
 - `strset()`
 - `empty()`
 - `end()`
 - `erase()`
 - `find()`
 - `length()`
 - `swap()`

12. Templates

- Template
 - template with functions
 - template with class
- Types of Template
 - Type template
 - Non-type template
 - Template Template
- Template specialization

13. Exception Handling

- Types of error
 - Compile time Error
 - Run time Error
- Exceptions
 - try-catch block
 - multi-catch block
 - nested try catch block

14. Pre-processor directives

- Pre processor directives

- `#include`
- `#define` & `#undef`
- `#ifdef` & `#ifndef`
- `#if`, `#else`, `#elseif`, `#endif`

Static web pages designing

HTML

1. Web concepts

- Web
- Dawn of web
- Architecture of the web
- basic concepts
 - Internet
 - ISP
 - HTTP/HTTPS
 - DNS
 - SMTP
 - W3C
 - URL
 - Hyperlink
 - website
 - webapplication
 - Web-browser
- Front-end vs back-end
- Introduction to markup languages
 - HTML
 - XML
 - MD
- Introduction to scripting languages
 - php
 - javascript

2. Starting with HTML5

- History & HTML5
- path for designing web page
- media
 - text
 - graphics
 - audio
 - video
- HTML with IDE concepts
- structure of HTML
- tag syntax
- basic tags
- tags with basic css
- comments
- lists
 - order list
 - unordered list
 - description list

- Anchor tag
- Table tag
 - attributes
 - caption
 - nested table

3. Form Tag

- Form
- form attributes
- form methods
- form controls
 - input tag
 - button
 - checkbox
 - radio button
 - select
 - text-area
 - label
 - input tag with HTML5
 - datalist
 - keygen
 - output

4. Media in web page

- About media
- Images in Web-pages
 - tag
 - <picture> tag
 - <a> with Image
 - image map
- Audio in HTML
 - audio attributes
- Video in HTML
 - video attributes
- Objects in HTML
- Graphics in HTML
 - canvas
 - svg
 - canvas vs svg

CSS

5. Role of CSS in web-page

- CSS & CSS3
- selectors in CSS
- Comments
- types of CSS
 - External
 - Internal
 - Inline
- css properties
- css variables

6. Animation with CSS

- Animation
- advantage of css animation
- keyframes
- animation
- vendors of web browser
- browser support

JavaScript

7. Web-scripting

- Java script(JS)
- IDEs for JS
- Features of JS
- Adding JS in HTML
 - internal
 - external
- comments & no-script tag
- variable
- functions
- events
- validation form With JS

8. jQuery

- jQuery
- Syntax of jQuery
- jQuery with Css selector
- methods in jQuery
- jQuery with HTML Elements
- Effects with JQuery

R W D

9. RWD

- RWD
- veiwport
- grid in css
- media queries
- Images
- video
- frameworks
- Templates

10. deployment

- Deployment
- need of deployment
- DNS
- Testing

PHP

1. Web Application development With PHP

- Side of web development
 - server side
 - client side
- history of PHP
- advantages of PHP
- features of PHP 7
- installing XAMPP server for PHP
- localhost & server
- Syntax of PHP
- “Hello World” in PHP

2. Dawn of Code with PHP

- comments
- Tokens & blocks
- variables
- Php with HTML & CSS
- echo vs print
- data Type
 - Integers
 - Boolean
 - double
 - String
 - Array
 - Objects
 - Callable
 - Iterable
 - NULL
 - Resources
- Escape Sequences
- normal function
- scope of variable
 - local
 - global
 - function parameter
 - static variable
- Constants
- Variable vs Constant

3. Statements

- Operators
 - Arithmetic
 - Relational
 - Logical
 - bitwise
 - assignment
 - conditional
 - array
- Conditional control statements
 - if statements
 - if else
 - if else ladder
 - swicth
- Iteration control statements
 - while loop
 - do while loop
 - for loop
 - for-each loop
- Jump statements
 - break
 - continue
 - return
 - exit
 - goto

4. Array & functions

- Array
 - numeric array
 - Associative array
 - Multi-dimension
- functions
 - build-in function
 - user-defined function
- function header & body
- HTML form tag
 - get method
 - post method
 - request
- Form validation with PHP

5. OOP's Concept with PHP

- Basic concept
 - class & Object
 - member variable
 - member function
 - visibility of data member & member function
- Constructor
- Destructor
- Inheritance

- single inheritance
- multi-level inheritance
- Hierarchical Inheritance
- Interface & Abstract
- constants in class
- keyword with class
 - this
 - static
 - final
- Anonymous class
- Polymorphism
 - static polymorphism
 - Dynamic Polymorphism
- Magic methods

6. Database connection

- MySQL
- Database handling with GUI in phpmyadmin
 - create user
 - create database
 - create table
 - perform various queries on table
- Database Handling with PHP scripts
 - DDL queries
 - DML queries
 - DQL queries
 - DCL queris
- fetching values from database
 - mysqli_fetch_ array
 - mysqli_fetch_ assoc
 - MYSQLI_NUM
- Managing pages with PHP
- create log-in system with php

7. Handling Errors

- Errors
- die / exit function
- create custom error message
- Level of errors
- Handling Exception withn try-catch block
- errors & logs
- debugging

8. Dates & Time

- Time()
- date()
- getdate()
- date & time parameters

9. MVC

- Understanding MVC
- Creating Controller
- Creating Model
- Creating View
- Combining MVC

10. Testing web applications

- Testing
- need of Testing
- checklist(manually Testing)
 - functionality Testing
 - Usability Testing
 - compatibility Testing
 - Database Testing
 - Crowd Testing
 - Interface Testing
 - Performance Testing
 - Security Testing
- Automatic Testing
 - TDD
 - BDD
- Frameworks
 - PHPUnit
 - Codeception
 - PHPSpec
 - SimpleTest
 - BeHat
 - storyplayer
- Testing web applications with
 - PHPUnit
 - Codeception

11. Security In Web applications

- Security
- special characters
- Authentication
- Encryption
- Securing web application

J A V A

1. Introduction to Java Programming

- What is java
- History of java
- Difference between c++ & Java
- Features of Java
- Java Virtual machine (JVM)
- Java Development Kit (JDK)
- Java Run-time Environment (JRE)
- parts of JAVA Edition SE, EE, ME
- JDK installation & environment variable's path setting
- "Hello world" first program in java
 - compile & run the program
 - .class file
 - java _{vs} javac cmds
 - run program without class file
- Tokens in java
 - variable
 - keywords
 - literals
 - special symbols
 - strings
 - operator
- About main method
- display statements
 - System.out.println()
 - System.out.print()
 - System.out.printf()

2. Dawn of core programming

- Comments in programming
 - single line
 - multi-line
 - document
- naming conventions
- data types
 - Integer
 - float
 - double
 - character
 - string
 - boolean
- Literals
 - Integer
 - float
 - double
 - character
 - string
 - boolean

- Importing classes & packages
 - Scanner class
 - BufferedReader
- Operators
 - Binary Operators
 - Arithmetic
 - relational
 - logical
 - bitwise
 - assignment
 - Unary operator
 - minus
 - plus
 - increment
 - decrement
 - Ternary operator
 - ()?: operator
 - Other operator
 - boolean
 - instanceof
 - new
 - cast
- Priority of Operator

3. Control statements

- Conditional statement
 - if statement
 - if .. else statement
 - else if ladder
 - nested if else
 - switch statement
- Iteration control statement
 - while loop
 - do .. while loop
 - for loop
 - for-each loop
 - nested loop
- Flow control statement
 - break
 - continue
 - return
 - System.exit(0)

4. Array : collection of elements

- Understanding array
- types of array
 - 1 dimension array
 - 2 dimension array
 - nth dimension array
- Array.length & string.length()

- command line arguments

5. String

- String class
 - String Constructors
 - string class methods
 - String comparing
 - Immutability of Strings
- StringBuffer class
 - StringBuffer constructors
 - StringBuffer methods
- String Tokenizer

6. OOP's Concepts with JAVA

- POP vs OOP
- java as Pure OOP
- class & objects
 - data members & methods
- constructors
 - Default constructor
 - parameterized constructor
- Encapsulation
- abstraction
- access specifiers
 - public
 - private
 - protected
 - default
- inheritance
- polymorphism

7. Methods

- Understanding methods
- Method prototype & method Body
- function vs method
- instance of method
- passing to method
 - passing value
 - passing object
 - passing array
- recursion

- factory method
- static keyword
 - static method
 - static data member
 - static block
- Anonymous inner class

8. Inheritance

- Understanding Inheritance
- Types of Inheritance
 - single
 - multi-level
 - hierarchical
- Why java doesn't support Multiple inheritance
- this keyword
- super keyword
- protected keyword
- final keyword
 - final data member
 - final method
 - final class

9. Polymorphism

- Understanding Polymorphism
- Types of polymorphism
 - Compile time polymorphism
 - Run-time Polymorphism
- Method overloading vs method overriding
- Polymorphism with methods
 - static
 - private
 - final

10. Type casting

- Types of type casting
 - widening
 - narrowing
- Generalization & Specialization
- Object class
- cloning the object

11. Abstract & Interface

- Abstract
 - Abstract method & abstract class
- Interface
- multiple inheritance using interface
- Abstract class vs Interface

12. Packages

- Understanding packages
- packages
 - Build-in packages
 - User-Defined packages
- jar file
- interface with package
- nested package

13. Exception Handling

- Errors in Java
- Exceptions
- throws clause & throw clause
- Types of Exception
 - Build-in in exception
 - User-Defined exception
- re-throwing an exception

14. Wrapper classes

- Understanding wrapper class
- Number class
- Character class
- Byte class
- Short class
- Integer class
- long class
- Float class
- Double class
- Boolean class

15. The collection Framework

- Understanding Collection Framework
- Array of object as Collection
- Collection Objects
 - Sets
 - Lists
 - Queues
 - Maps
- Retrieving Elements from Collection Objects
 - For-each
 - Iteration Interface
 - ListIteration Interface
 - Enumeration Interface
- HashSet class
- LinkedHashMap class
- Stack class
- LinkedList class
- ArrayList class
- Vector class
- HashMap class
- Hashtable class
- Calendar class
- Data class

16. Streams & Files

- Understanding Stream
- File handling
 - FileOutputStream
 - FileInputStream
 - FileWriter
 - FileReader
- Zip & UnZip the files
- File class

17. Networking in Java

- Understanding networks
- TCP/IP protocol
- User Data-gram Protocols
- socket programming
 - Knowing IP Address
 - URL class
 - creating server & client
 - server client talks
 - file sharing

18. Threads

- Understanding process & Threads

- Thread Life Cycle
- Multi-threaded in java
- Multiple Threads Acting on Single Object
- Thread Class Methods
- Deadlock of Threads
- Daemon Threads
- Applications of Thread

19. Graphics programming

- GUI
- draw with frames
- AWT vs Swing
- frames
- Layouts
 - flow layout
 - Card Layout
 - GridBagLayout
 - Border layout
 - Grid Layout
 - BoxLayout
- swing widgets
 - JButton
 - JpasswordField
 - Jlist
 - JLabel
 - JcomboBox
 - JtextField
 - JcheckBox
 - JMenu
 - JtextArea
 - JradioButton
- Event handling with interfaces
- creating own GUI Desktop app.

PYTHON

1. Introduction to Python

- Python Overview
- History
- versions of Python
- Features of Python
- installing Python
- Create first program in Python
 - using shell scripting
 - using text editor
- Innards of Python
 - Python Interpreter
 - Byte Code
 - program execution
- Comparison of Python
 - java
 - JavaScript
 - c++
 - Perl

2. Dawn with Core

- Comments
- Variables
- Data Types
 - Numeric Data Type
 - Integer
 - float
 - complex
 - Boolean Data Type
 - boolean
 - Compound Data Type
 - string
 - Dictionaries
 - list
 - set
 - tuple
- keywords
- Print & input function
- Type casting
 - implicit
 - explicit
- pip
- clrprint module

3. Operators & Operands

- Operators & Operands
- Types of Operators
 - Arithmetic
 - Relational
 - Logical
 - Bitwise
 - Assignment
 - Membership, Identity
- Precedence & associativity

4. Control statements

- Boolean values
- Decision statements
 - if statement
 - if ... else statement
 - elif statement
 - nested if statement
- Iteration control statement
 - for loop
 - while
 - else clause with for & while loop
- flow control statements
 - break
 - continue
 - return
 - exit
- Pass statement

5. String

- String
- ways to define a string
- accessing & slicing string
- immutable string
- string methods
- string formatting using
 - % operator
 - format()
- string operations
- string module
 - constants
 - methods
 - templates

6. Array

- Array
- array with Array Module
 - import in array
 - declare array
 - indexing & slicing
 - operation on array
 - Array methods
- array with numpy
 - import numpy
 - declare array
 - declaring multi-dimension in numpy
 - advance indexing & slicing
 - Array operation
- Numpy array vs array

7. functions

- Function
- function header & body part
- function call
- return statement
- function parameter & arguments
 - formal parameter & actual argument
 - keyword argument
 - default argument
 - arbitrary argument
- Anonymous / lambda function
- scope of Variable
 - local
 - global
- Recursion
 - base case in recursion
 - advantage & disadvantages
- Modules
 - creating used-defined module
 - importing modules
 - `__main__`
 - use modules in other program

8. Data collection

- Understanding data collection

- list
 - list indexing & slicing
 - list operation
 - list methods
 - list mutable
- tuple
 - tuple indexing & slicing
 - tuple operation
 - tuple method
 - tuple immutable
- Set
 - set indexing & slicing
 - set operation
 - set methods
 - set mutable
- Dictionary
 - dictionary indexing & slicing
 - dictionary operation
 - dictionary method
 - dictionary mutable
- aliasing & cloning
- data collection with in another collection
- data structure using data collection

9. OOP with Python

- OOP
- class & object
- instance variables & instance methods
- constructor & destructor as magic method
- Types of Methods
 - instance method
 - class method
 - static method
- Privacy in python with access specifiers

10. Inheritance & Polymorphism

- Inheritance
 - super class & base class
 - single inheritance
 - multi-level inheritance
 - multiple inheritance
 - hierarchical Inheritance

- Hybrid inheritance
- constructions with inheritance
- Method Resolution Order
- Polymorphism
 - method overloading
 - Operator overload
 - method overriding

11. Abstract class & Interfaces

- Abstract Class
 - Abstract Base class
 - Abstract Method
- Interface
 - interface

12. Recursion

- Recursion with base case
- significance of recursion
- snags of Recursion

13. Numbers,Dates Time

- Numbers
 - Numeric types in python
 - Number type conversion
 - maths functions
 - Random module
 - Trigonometric fuction
- Date & Time
- datetime module
- date module
- time module

14. Regular Expressions

- Understanding Regular Expressions
- meta-characters
- regular Expression method
 - compile
 - match
 - split
 - search
 - findall

15. GUI

- GUI
- drawing with Turtle
- GUI with PyQt5
 - layouts
 - widgets
- Event handling

16. File Handling

- Text File & binary File
- file modes
 - r • r+ • rb • rb+
 - b • w+ • wb • wb+
 - a • a+ • ab • ab+
- file operation
 - create • write • tell • rename
 - open • read • seek • remove
 - close • append
- Working with directories
 - mkdir() • rmdir()
 - getcwd() • glob()
 - chdir()

17. Database with pymysql

- Database
- connection with database
- DDL queries
 - Create • drop • truncate
 - alter • rename
- DQL query
 - select
- DML queries
 - insert • update • delete
- ACID properties in Transactions

18. Exception handling

- Errors & exceptions
- Exception
 - Build-in Exception
 - user-defined exception
- Try-except block
- multiple except blocks
- pass statement in try-except
- else clause in try-except
- finally block
- user-defined exception

19. Socket programming

- Sockets
- TCP/IP model
- creating server/client with communicating
- Executing server client

20. Thread

- Process & thread
- thread life cycle
- Threads
 - creating thread
 - creating multiple threads
- threading module