11th STD COMPUTER SCIENCE SPECIAL GUIDE

KRISHNAGIRI DISTRICT

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CHAPTER 1: Introduction to Computers

Choose the correct answer:

1. First generation computers used
(a) Vacuum tubes (b) Transistors (c) Integrated circuits (d) Microprocessors
2. Name the volatile memory
(a) ROM (b) PROM (c) RAM (d) EPROM
3. Identify the output device
(a) Keyboard (b) Memory (c) Monitor (d) Mouse
4. Identify the input device
(a) Printer (b) Mouse (c) Plotter (d) Projector
5. ..... Output device is used for printing building plan.
(a) Thermal printer (b) Plotter (c) Dot matrix (d) inkjet printer
6. Which one of the following is used to in ATM machines
(a) Touch Screen (b) speaker (c) Monitor (d) Printer
7. When a system restarts which type of booting is used.
(a) Warm booting (b) Cold booting (c) Touch boot (d) Real boot.
8. Expand POST
(a) Post on self Test (b) Power on Software Test (c) Power on Self Test (d) Power on Self Text
9. Which one of the following is the main memory?
(a) ROM (b) RAM (c) Flash drive (d) Hard disk
10. Which generation of computer used IC's?
(a) First (b) Second (c) Third (d) Fourth

Very Short Answers:

1. What is a computer?
A Computer is an electronic device that processes the input according to the set of instructions provided to it and gives the desired output at a very fast rate.

2. Distinguish between data and information.

Data	Information
Data is defined as an un-processed collection of raw facts. Example: 134, 16 _Kavitha', _C'	Information is a collection of facts from which conclusions may be drawn. Example: Kavitha is 16 years old.

3. What are the components of a CPU?
- Control unit,
- Arithmetic and logic unit (ALU)
- Memory unit.

4. What is the function of an ALU?
The ALU performs arithmetic operations such as addition, subtraction, multiplication, division and logical operations.

5. Write the functions of control unit.
The control unit controls the flow of data between the CPU, memory and I/O devices.

6. What is the function of memory?
Memory enables the computer to store the program. The memory unit is of two types:
- Primary memory
- Secondary memory

7. Differentiate Input and output unit.

Input unit	Output unit
Input unit is used to feed any form of data to the computer.	An Output Unit is any hardware component that conveys information to users in an understandable form.

8. Distinguish Primary and Secondary memory.

Primary Memory	Secondary memory
The primary memory is used to store the data temporarily. Example: RAM	The secondary memory is used to store the data permanently. Example: Hard disk, CD-ROM and DVD

Short Answers:

1. What are the characteristics of a computer?
   - Speed
   - Accuracy
   - Reliability
   - Diligence
   - Multi Processing
   - Memory

2. Write the applications of computer.
Computers are used to storing data, in the field of education, research, travel and tourism, weather forecasting, social networking, e-commerce, booking airlines, railway or movie tickets and even playing games.

3. What is an input device? Give two examples.
Input unit is used to feed any form of data to the computer, which can be stored in the memory unit for further processing. Example: Keyboard, mouse, etc.

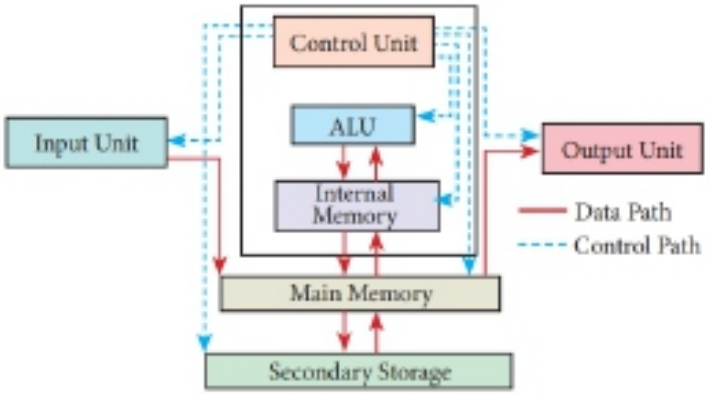
4. Name any three output devices.
Monitor: Monitor is used to display the information.
Printers: Printers are used to print the information on papers.
Plotter: Plotter is used to produce graphical output on papers.

5. Write short note on impact printer.
These printers print with striking of hammers or pins on ribbon. Example: Dot Matrix printers and Line matrix printers.

Explain in detail:

1. Explain the basic components of a computer with a neat diagram.
Input Unit: To feed any form of data to the computer. Example: Keyboard, mouse, etc.
Central Processing Unit has three components,
The control unit controls the flow of data between the CPU, memory and I/O devices.
The ALU performs arithmetic operations
Memory enables the computer to store the program.
Output Unit: Convey the information to users in an understandable form. Example: Monitor, Printer etc.
Memory Unit: Two types:

The primary memory is used to store the data temporarily.
The secondary memory is used to store the data permanently.



2. Discuss the various generations of computers.

First Generation (1940-1956) - Vacuum tubes
Second Generation (1956-1964) - Transistors
Third Generation (1964 -1971) - Integrated Circuits (IC)
Fourth Generation (1971-1980) - Microprocessor
Fifth Generation (1980 - till date) - Ultra Large Scale Integration (ULSI)
Sixth Generation (In future) - Development of robotics

CHAPTER 2: Number Systems

Choose the correct answer:

1. Which refers to the number of bits processed by a computer's CPU?
A) Byte B) Nibble C) Word length D) Bit

2. How many bytes does 1 KiloByte contain?
A) 1000 B) 8 C) 4 D) 1024

3. Expansion for ASCII
A) American School Code for Information Interchange
B) American Standard Code for Information Interchange
C) All Standard Code for Information Interchange
D) American Society Code for Information Interchange

4. 2^50 is referred as
A) Kilo B) Tera C) Peta D) Zetta

5. How many characters can be handled in Binary Coded Decimal System?
A) 64 B) 255 C) 256 D) 128

6. For (1101)2 the equalent Hexadecimal equivalent is?
A) F B) E C) D D) B

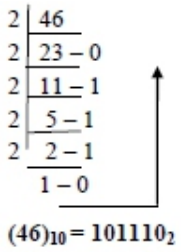
7. What is the 1's complement of 00100110?
A) 00100110 B) 11011001 C) 11010001 D) 00101001

8. Which amongst this is not an Octal number?
A) 645 B) 234 C) 876 D) 123

Very Short Answers:

1. Write the 1"s complement procedure.
Convert given Decimal number into Binary Check if the binary number contains 8 bits , if less add 0 at the left most bit, to make it as 8 bits. Invert all bits (i.e. Change 1 as 0 and 0 as 1)

2. Convert (46)10 into Binary number.



$(46)_{10} = 101110_2$

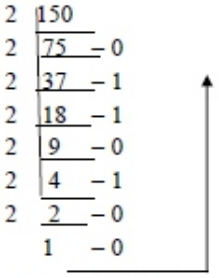
Short Answers:

1. What is radix of a number system? Give example.
Radix or base is the count of number of digits in each number system.
Example : The decimal number system has ten distinct digits (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) - Radix 10

2. Write note on binary number system.
- There are only two digits in the Binary system, namely, 0 and 1.
- The left most bit in the binary number is called as the Most Significant Bit
- (MSB) and it has the largest positional weight.
- The right most bit is the Least Significant Bit (LSB) and has the smallest positional weight.

3. Convert (150)10 into Binary, then convert that Binary number to Octal.

Step 1: Convert (150)10 into Binary:



$150_{10} = 10010110_2$

Step 2: Convert (10010110)2 to Octal:

010 010 110
2 2 6

$150_{10} = 226_8$

4. Add a) (-22)10 +(15)10 b) (20)10 +(25)10

(a) (-22)10 + (15)10

The Binary Equivalent of 22_{10} :		10110_2
8 – Bit Format:		00010110
1's Complement:		11101001
Add 1 Bit:		1
2's Complement:		11101010
-22	=	1110 1010
15	=	0000 1111
$-22_{10} + 15_{10}$	=	1111 1001

(b) (20)10 +(25)10

The Binary Equivalent of 20_{10} =		10100
The Binary Equivalent of 25_{10} =		11001
$20_{10} + 25_{10}$	=	101101

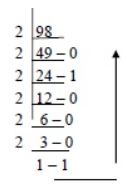
Explain in detail:

1. a) Write the procedure to convert fractional Decimal to Binary .

The steps involved in the method of repeated multiplication by 2:

- Multiply the decimal fraction by 2 and note the integer part. The integer part is either 0 or 1.
- Discard the integer part of the previous product. Multiply the fractional part of the previous product by 2. Repeat Step 1 until the same fraction repeats or terminates (0).
- The resulting integer part forms a sequence of 0s and 1s that become the binary equivalent of decimal fraction.
- The final answer is to be written from first integer part obtained.

b) Convert (98.46)10 to Binary



The Binary Equivalent of $(98)_{10}$: 1100010_2

0.46 x 2 = 0.92 | 0
0.92 x 2 = 1.84 | 1
0.84 x 2 = 1.68 | 1
0.68 x 2 = 1.36 | 1
0.36 x 2 = 0.72 | 0

The Binary Equivalent of 0.46 : $(0.01110\ldots)_2$

$(98.46)10 = (1100010.\ 0111\ 0\ldots)_2$

2. Find 1"s Complement and 2"s Complement for the following Decimal number
a) -98 b) -135

(a)

2	98	
2	49	– 0
2	24	– 1
2	12	– 0
2	6	– 0
2	3	– 0
	1	– 1

The Binary Equivalent of 98_{10} = 1100010_2

8 bit format	=	01100010
1's complement	=	**10011101**
Add 1 bit	=	+ 1
2's Complement	=	**10011110**

(b)

2	135	
2	67	– 1
2	33	– 1
2	16	– 1
2	8	– 0
2	4	– 0
2	2	– 0
	1	– 0

The Binary Equivalent of $135_{10} = 10000111_2$

1'st complement	=	**01111000**
Add 1 bit	=	+ 1
2's Complement	=	**01111001**

3. a) Add (1101010)2+(101101)2 b) Subtract (1101011)2 – (111010)2

a) Add (1101010)2+(101101)2

```
  1101010
   101101
 10010111
```

b) Subtract 11010112 - 1110102

```
  1101011
   111010
   110001
```

Part - II - Boolean Algebra

Choose the correct answer:

1. Which is a basic electronic circuit which operates on one or more signals?

(A) Boolean algebra (B) Gate (C) Fundamental gates (D) Derived gates

2. Which gate is called as the logical inverter?

(A) AND (B) OR (C) NOT (D) XNOR

3. A + A = ?

(A) A (B) O (C) 1 (D) A

4. NOR is a combination of ?

(A) NOT(OR) (B)NOT(AND) (C) NOT(NOT) (D) NOT(NOR)

5. NAND is called as …… Gate

(A) Fundamental Gate (B) Derived Gate (C) Logical Gate (D) Universal gate

Very Short Answers:

1. What is Boolean Algebra?

Boolean algebra is a mathematical discipline that is used for designing digital circuits in a digital computer.

2. Write the associative laws?

A + (B + C) = (A + B) + C

(B. C) = (A. B). C

3. What are derived gates?

NAND, NOR, XOR, XNOR are Derived Gates which are derived from the fundamental gates.

Short Answers:

1. Write the De Morgan‟s law.

- $\overline{(A+B)} = \overline{A}\,\overline{B}$
- $\overline{(AB)} = \overline{A} + \overline{B}$

Explain in detail:

1. Explain the fundamental gates with expression and truth table.

There are three fundamental gates namely AND, OR and NOT.

AND gate:

The AND gate can have two or more input signals and produce an output signal.

The output will be 1 if and only if both inputs are 1; otherwise the output is 0.

The logical symbol of AND gate and Truth Table:

Inputs		Output
A	B	Y=A.B
0	0	0
0	1	0
1	0	0
1	1	1

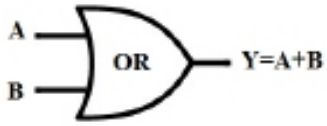
OR Gate

The OR gate gets its name from its behaviour like the logical inclusive "OR".

The output will be 1 if and only if one or both inputs are 1; otherwise, the output

is 0.

The logical symbol of OR gate and Truth Table:

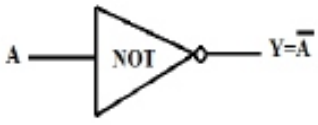


Inputs		Output
A	B	Y=A+B
0	0	0
0	1	1
1	0	1
1	1	1

NOT Gate

The NOT gate, called a logical inverter, has only one input. It reverses the logical state.

The logical symbol of NOT gate and Truth Table:



Input	Output
A	Y=$\overline{A}$
0	1
1	0

2. Explain the Derived gates with expression and truth table.

NAND, NOR, XOR, XNOR are Derived Gates which are derived from the fundamental gates.

NAND Gate:

The NAND gate operates an AND gate followed by a NOT gate.

The output is 0 if both the inputs are 1, otherwise the output is 1.

The logical symbol of NAND gate and Truth Table:

Inputs		Output
A	B	Y=$\overline{A.B}$
0	0	1
0	1	1
1	0	1
1	1	0

NOR Gate

The NOR gate circuit is an OR gate followed by an inverter.

The output is '1' if both the inputs are '0'. Otherwise the output is 0.

The logical symbol of NOR gate and Truth Table:

Inputs		Output
A	B	$Y=\overline{A+B}$
0	0	1
0	1	0
1	0	0
1	1	0

XOR Gate:

The XOR (exclusive - OR) gate acts in the same way as the logical "either/or."

The output is 1 if the inputs are different, but 0 if the inputs are the same.

The logical symbol of XOR gate and Truth Table:

Inputs		Output
A	B	Y=A⊕B
0	0	0
0	1	1
1	0	1
1	1	0

XNOR gate.

The XNOR (exclusive – NOR) gate is a combination of XOR gate followed by an inverter.

The output is 1 if the input are the same, otherwise the output is 0.

The logical symbol of XNOR gate and Truth Table:

Inputs		Output
A	B	$Y=\overline{A \oplus B}$
0	0	1
0	1	0
1	0	0
1	1	1

CHAPTER 3: Computer Organisation

Choose the correct answer:

1. Which of the following is said to be the brain of a computer?
(a) Input devices (b) Output devices (c) Memory device (d) Microprocessor

2. Which of the following is not the part of a microprocessor unit?
(a) ALU (b) Control unit (c) Cache memory (d) register

3. How many bits constitute a word?
(a) 8 (b) 16 (c) 32 (d) determined by the processor used.

4. Which of the following device identifies the location when address is placed in the memory address register?
(a) Locator (b) encoder (c) decoder (d) multiplexer

5. Which of the following is a CISC processor?
(a) Intel P6 (b) AMD K6 (c) Pentium III (d) Pentium IV

6. Which is the fastest memory?
(a) Hard disk (b) Main memory (c) Cache memory (d) Blue-Ray disc

7. How many memory locations are identified by a processor with 8 bits address bus at a time?
(a) 28 (b) 1024 (c) 256 (d) 8000

8. What is the capacity of 12cm diameter DVD with single sided and single layer?
(a) 4.7 GB (b) 5.5 GB (c) 7.8GB (d) 2.2 GB

9. What is the smallest size of data represented in a CD?
(a) blocks (b) sectors (c) pits (d) tracks

10. Display devices are connected to the computer through.
(a) USB port (b) Ps/2 port (c) SCSI port (d) VGA connector

Very Short Answers:

1. What are the parameters which influence the characteristics of a microprocessor?
- Clock speed
- Instruction set
- Word size

2. What is an instruction?
A command which is given to a computer to perform an operation on data is called an instruction.

3. What is a program counter?
The Program Counter (PC) is a special register in the CPU which always keeps the address of the next instruction to be executed.

4. What is HDMI?
High-Definition Multimedia Interface is an audio/video interface which transfers the uncompressed video and audio data from a video controller, to a compatible computer monitor, LCD projector, digital television etc.

Short Answers:

1. Differentiate Computer Organisation from Computer Architecture.

Computer Organisation	Computer Architecture
Computer Organisation deals with the hardware components that are transparent to the programmer.	Computer architecture deals with the engineering considerations involved in designing a computer.

2. Classify the microprocessor based on the size of the data.

- 8-bit microprocessor
- 16-bit microprocessor
- 32-bit microprocessor
- 64-bit microprocessor

3. Write down the classifications of microprocessors based on the instruction set.
Reduced Instruction Set Computers (RISC)
Complex Instruction Set Computers (CISC)

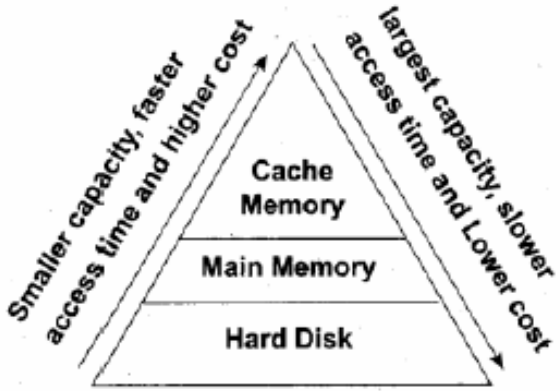
Explain in detail:

1. Explain the characteristics of a microprocessor.
A Microprocessor's performance depends on the following characteristics:

- Clock speed
- Instruction set
- Word size

Clock Speed : Every microprocessor has an internal clock that regulates the speed at which it executes instructions.
Instruction Set : Basic set of machine level instructions that a microprocessor is designed to execute is called as an instruction set.
Word Size : The number of bits that can be processed by a processor in a single instruction is called its word size.

2. Arrange the memory devices in ascending order based on the access time.
Different memory devices are arranged according to the capacity, speed and cost.



3. Explain the types of ROM.

Read Only Memory (ROM):

- Read Only Memory refers to special memory in a computer.
- ROM stores critical programs such as the program that boots the computer. Once the data has been written onto a ROM chip, it cannot be modified or removed and can only be read.

Programmable Read Only Memory (PROM):

- Programmable read only memory is also a non-volatile memory on which data can be written only once.

Erasable Programmable Read Only Memory (EPROM):

- Erasable Programmable Read Only Memory is a special type of memory which serves as a PROM, but the content can be erased using ultraviolet rays.

Electrically Erasable Programmable Read Only Memory (EEPROM):

- Electrically Erasable Programmable Read Only Memory is a special type of PROM that can be erased by exposing it to an electrical charge.

CHAPTER 4: Theoretical concepts of Operating System

Choose the correct answer:

1. Operating system is a

A) Application Software B) Hardware C) System Software D) Component

2. Identify the usage of Operating Systems

A) Easy interaction between the human and computer
B) Controlling input & output Devices
C) Managing use of main memory
D) All the above

3. Which of the following is not a function of an Operating System?

A) Process Management B) Memory Management
C) Security management D) Complier Environment

4. Which of the following OS is a commercially licensed Operating system?

A) Windows B) UBUNTU C) FEDORA D) REDHAT

5. Which of the following Operating systems support Mobile Devices?

A) Windows 7 B) Linux C) BOSS D) iOS

6. File Management manages

A) Files B) Folders C) Directory systems D) All the Above

7. Interactive Operating System provides

A) Graphics User Interface (GUI) B) Data Distribution
C) Security Management D) Real Time Processing

8. An example for single task operating system is

A) Linux B) Windows C) MS-DOS D) Unix

9. The File management system used by Linux is

A) ext2 B) NTFS C) FAT D) NFTS

Very Short Answers:

1. List out any two uses of Operating System?
   - Controlling Input and Output Devices .
   - Manage the utilisation of main memory.

2. What is multi-user Operating system?

It is used in computers and laptops that allow same data and applications to be accessed by multiple users at the same time.
Example: Windows, Linux and UNIX .

3. What is a GUI?

The GUI is a window based system with a pointing device to direct I/O, choose from menus, make selections and a keyboard to enter text. Its vibrant colours attract the user very easily.

4. What are the security management features available in Operating System ?
   - File access level
   - System level
   - Network level

5. What is multi-processing?

This is a one of the features of Operating System. It has two or more processors for a single running process (job).

6. What are the different Operating Systems used in computer?
- UNIX
- Linux
- Mac OS
- MS-DOS
- Microsoft Windows

Short Answers:

1. List out the key features of Operating system.
- User Interface (UI)
- Memory Management
- Process management
- Security Management
- Fault Tolerance
- File Management

Explain in detail:

1. Explain the process management algorithms in Operating System.

The following algorithms are mainly used to allocate the job (process) to the processor.

1. FIFO
2. SJF
3. Round Robin
4. Based on Priority

FIFO (First In First Out) Scheduling:
This algorithm is based on queuing technique.

SJF (Shortest Job First) Scheduling:
This algorithm works based on the size of the job being executed by the CPU.

Round Robin Scheduling:
The Round Robin (RR) scheduling algorithm is designed especially for time sharing systems. Jobs (processes) are assigned and processor time in a circular method.

Based On Priority:
The given job (process) is assigned based on a Priority. The job which has higher priority is more important than other jobs.

CHAPTER 5: Working with Windows Operating System

Choose the correct answer:

1. From the options given below, choose the operations managed by the operating system.

a. Memory b. Processes c. Disks and I/O devices d. all of the above

2. Which is the default folder for many Windows Applications to save your file?

a. My Document b. My Pictures c. Documents and Settings d. My Computer

3. Under which of the following OS, the option Shift + Delete – permanently deletes a file or folder?

a. Windows 7 b. Windows 8 c. Windows 10 d. all of the above

4. What is the meaning of "Hibernate" in Windows XP/Windows 7?

a. Restart the Computer in safe mode

b. Restart the Computer in hibernate mode

c. Shutdown the Computer terminating all the running applications

d. Shutdown the Computer without closing the running applications

5. The shortcut key used to rename a file in windows

a. F2 b.F4 c.F5 d. F6

Very Short Answers:

1. What is known as Multitasking?

Multiple applications can execute simultaneously in Windows, and this is known as “Multitasking”.

2. What are called standard icons?

The icons which are available on desktop by default while installing Windows OS are called standard icons.

3. Differentiate Files and Folders.

Files	Folders
File is a collection of related data or information that is created by Application.	Folder is a way to organize files into group and put them under a common name.

4. Differentiate Save and save As option.

Save	save As
Save option is used to save a new document with name.	Save As option is used to save an already existing document with a new name.

5. How will you Rename a File?

- Select the File or Folder you wish to Rename.
- Click File→ Rename. (or)
- Click the right mouse button over the file or folder and Select Rename fromthe pop-up menu (or)
- Press F2 .
- Type in the new name. To finalize the renaming operation, press Enter.

Short Answers:

1. Write a note on Recycle bin.

- Recycle bin is a special folder to keep the files or folders deleted by the user, which means you still have an opportunity to recover them.
- The user cannot access the files or folders available in the Recycle bin without restoring it.
- To restore file or folder from the Recycle Bin.

2. Write the two ways to create a new folder.

Method I:

- Open Computer Icon.
- Open any drive where you want to create a new folder. (For example select D:)
- Click on File → New → Folder.
- A new folder is created with the default name —New folder‖.
- Type the name you want and press Enter Key.

Method II:

- In the Desktop, right click → New → Folder.
- A Folder appears with the default name —New folder‖.
- Type the name you want and press Enter Key

3. Differentiate copy and move.

Copy	Move
It means to make a duplicate copy of a file.	It means to transfer a file from one location to another.
The original file remains at the source location.	The original file is moved to the destination location.
It uses the Copy & Paste option. Click Edit → Copy or Ctrl + C Click Edit → Paste or Ctrl + V	It uses the Cut & Paste option. Click Edit → Cut or Ctrl + X Click Edit → Paste or Ctrl + V

Explain in detail:

1. Explain the versions of Windows Operating System.

Version	Year	Specific Feature
Windows 1.x	1985	Introduction of GUI in 16 bit Processor.
Windows 2.x	1987	Supports to minimize or maximize windows.
Windows 3.x	1992	Introduced the concept of multitasking.
Windows 95	1995	Introduced Start button, the taskbar, Windows Explorer and Start menu.
Windows 98	1998	Plug and play feature was introduced.
Windows 2000	2000	Served as an Operating System for business desktop and laptop systems.
Windows XP	2001	Introduced 64 bit Processor.
Windows 7	2009	Booting time was improved
Windows 8	2012	Served as common platform for mobile and computer.
Windows 10	2015	Start Button was added again, Multiple desktop.

2. Explain the different ways of finding a file or Folder.

To find a file or folder:

- Click the Start button, the search box appears at the bottom of the start menu.
- Type the name of the file or the folder you want to search, it will display the list of files or folders starting with the specified name.
- Just click and open that file or the folder.

Searching Files or folders using Computer icon

- Click Computer Icon from desktop or from Start menu.
- The Computer disk drive screen will appear and at the top right corner of that screen, there is a search box option.
- Type the name of the file or the folder you want to search, it will display the list of files or folders starting with the specified name.
- Just click and open that file or the folder.

CHAPTER 6: Specification and Abstraction

Choose the correct answer:

1. Which of the following activities is algorithmic in nature?
(a) Assemble a bicycle (b) Describe a bicycle
(c) Label the parts of a bicycle (d) Explain how a bicycle works.

2. Which of the following activities is not algorithmic in nature?
(a) Multiply two numbers. (b) Draw a kolam.
(c) Walk in the park. (d) Swapping of two numbers.

3. Omitting details inessential to the task and representing only the essential features of the task is known as
(a) specification (b) abstraction (c) composition (d) decomposition

4. Stating the input property and the input-output relation a problem is known
(a) specification (b) statement (c) algorithm (d) definition

5. Ensuring the input-output relation is
(a) the responsibility of the algorithm and the right of the user.
(b) the responsibility of the user and the right of the algorithm.
(c) the responsibility of the algorithm but not the right of the user.
(d) the responsibility of both the user and the algorithm

6. If i = 5 before the assignment i := i-1 after the assignment, the value of i is
(a) 5 (b) 4 (c) 3 (d) 2

7. If 0 < i before the assignment i := i-1 after the assignment, we can conclude that
(a) 0 < i (b) 0 ≤ i (c) i = 0 (d) 0 ≥i

Very Short Answers:

1. Distinguish between an algorithm and a process.

Algorithm	Process
An algorithm is a sequence of instructions to accomplish a task or solve a problem.	When the instructions are executed, a process evolves, which accomplishes the intended task or solves the given problem.

Short Answers:

1. When do you say that a problem is algorithmic in nature?
- A Problem is algorithmic in nature when its solution involves the construction of an algorithm.
- Also when the, Input data and output data of the problem is specified. And relation between the input data and the output data is specified.

2. What is the format of the specification of an algorithm?
- Specification of an algorithm is the desired input-output relation.
- Let P be the required property of the inputs and Q the property of the desired outputs.
- algorithm_name (inputs)
- -- inputs : P
- -- outputs: Q

CHAPTER 7: Composition and Decomposition

Choose the correct answer:

1. Suppose u, v = 10 ,5 before the assignment. What are the values of u and v after the sequence of assignments? u := v
v := u

(a) u, v = 5 ,5 (b) u, v = 5 ,10 (c) u, v = 10 ,5 (d) u, v = 10 ,10

2. Which of the following properties is true after the assignment (at line 3?
1 --i, j = 0, 0
2 i, j := i+1, j-1
3 -- ?
(a) i+j >0 (b) i+j < 0 (c) i+j =0 (d) i = j

3. If C1 is false and C2 is true, the compound statement
1 if C1
2 S1
3 else
4 if C2
5 S2
6 else
7 S3 executes
(a) S1 (b) S2 (c) S3 (d) none

4. If C is false just before the loop, the control flows through
1 S1
2 while C
3 S2
4 S3
(a) S1 ; S3 (b) S1 ; S2 ; S3 (c) S1 ; S2 ; S2 ; S3 (d) S1 ; S2 ; S2 ; S2 ; S3

5. If C is true, S1 is executed in both the flowcharts, but S2 is executed in
(a) (1) only (b) (2) only (c) both (1) and (2) (d) neither (1) nor (2)

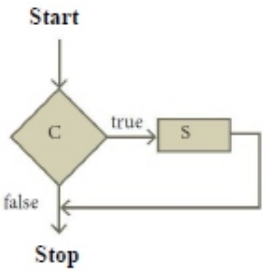
6. How many times the loop is iterated?
i := 0
while i ≠ 5
i := i + 1
(a) 4 (b) 5 (c) 6 (d) 0

Very Short Answers:

1. Distinguish between a condition and a statement.

CONDITION	STATEMENT
Condition is the Checking process of either True / False.	Processing the condition.
A condition is contained in a diamond shaped box with two outgoing arrows, labeled true and false. EX: a>b	A statement is contained in a rectangular box with a single outgoing arrow, which points to the box to be executed next. EX: Print a (a-is a Biggest value)

2. Draw a flowchart for conditional statement.



Short Answers:

1. What is case analysis?
   - Alternative statement analyses the problem into two cases. Case analysis statement generalizes it to multiple cases.
   - Case analysis splits the problem into an exhaustive set of disjoint cases.

CHAPTER 8: Iteration and recursion

Choose the correct answer:

1. A loop invariant need not be true
(a) at the start of the loop. (b) at the start of each iteration
(c) at the end of each iteration (d) at the start of the algorithm

2. We wish to cover a chessboard with dominoes, the number of black squares and the number of white squares covered by dominoes, respectively, placing a domino can be modeled by
(a) b := b + 2 (b) w := w + 2 (c) b, w := b+1, w+1 (d) b := w

3. If m x a + n x b is an invariant for the assignment a, b : = a + 8, b + 7, the values of m and n are
(a) m = 8, n = 7 (b) m = 7, n = -8 (c) m = 7, n = 8 (d) m = 8, n = -7

4. Which of the following is not an invariant of the assignment?
m, n := m+2, n+3
(a) m mod 2 (b) n mod 3 (c) 3 X m - 2 X n (d) 2 X m - 3 X n

5. If Fibonacci number is defined recursively as
0 n = 0
F (n) = 1 n = 1
F(n — 1) + F(n — 2) otherwise
to evaluate F(4), how many times F() is applied?
(a) 3 (b) 4 (c) 8 (d) 9

6. Using this recursive definition
1 if n = 0
n n -1
a = a x a otherwise
how many multiplications are needed to calculate a10?
(a) 11 (b) 10 (c) 9 (d) 8

Very Short Answers:

1. What is an invariant?
An expression of the variables has the same value before and after an assignment, it is an invariant of the assignment.

2. Define a loop invariant.
- An invariant for the loop body is known as a loop invariant.
- When the loop ends, the loop invariant has the same value.

CHAPTER 9: Introduction to C++

Choose the correct answer:

1. Who developed C++?
(a) Charles Babbage (b) Bjarne Stroustrup (c) Bill Gates (d) Sundar Pichai
2. What was the original name given to C++?
(a) CPP (b) Advanced C (c) C with Classes (d) Class with C
3. Who coined C++?
(a) Rick Mascitti (b) Rick Bjarne (c) Bill Gates (d) Dennis Ritchie
4. The smallest individual unit in a program is:
(a) Program (b) Algorithm (c) Flowchart (d) Tokens
5. Which of the following operator is extraction operator in C++?
(a) >> (b) << (c) <> (d) ^^
6. Which of the following statements is not true?
(a) Keywords are the reserved words which convey specific meaning to the C++ compiler.
(b) Reserved words or keywords can be used as an identifier name.
(c) An integer constant must have at least one digit without a decimal point.
(d) Exponent form of real constants consist of two parts
7. Which of the following is a valid string literal?
(a) 'A' (b) 'Welcome' (c) 1232 (d) "1232"
8. A program written in high level language is called as
(a) Object code (b) Source code (c) Executable code (d) All the above
9. Assume a=5, b=6; what will be result of a&b?
(a) 4 (b) 5 (c) 1 (d) 0
10. Which of the following is called as compile time operators?
(a) sizeof (b) pointer (c) virtual (d) this

Very Short Answers:

1. What is meant by a token? Name the token available in C++.
The smallest individual unit in a program is known as a Token or Lexical unit. C++ has the following tokens: Keywords, Identifiers, Constants, Operators, Punctuators.

2. What are keywords? Can keywords be used as identifiers?
Keywords are the reserved words which convey specific meaning to the C++ compiler. No, Reserved words or keywords cannot be used as an identifier name.

3. Match the following:

A	B	
(a) Modulus	(1) Tokens	(d)
(b) Separators	(2) Remainder of a division	(a)
(c) Stream extraction	(3) Punctuators	(b)
(d) Lexical Units	(4) get from	(c)

Short Answers:

1. Describe the differences between keywords and identifiers?

KEYWORDS	IDENTIFIERS
Keywords are the reserved words which convey specific meaning to the C++ compiler.	Identifiers are the user-defined names given to different parts of the C++ program.
EX: int , void , break , do , if etc..	EX: name, mark, num etc..

2. Is C++ case sensitive? What is meant by the term "case sensitive"?

- C++ is a case sensitive programming language.
- C++ is case sensitive as it treats upper and lower-case characters differently.

3. Differentiate "=" and "==".

=	==
= is a Assignment Operator.	= = is a Equality Operator.
Assign a value of an Variable. Ex: a = 5	To Indicate Two Operands are Equal. Ex: a= = b

4. What is the use of a header file?

iostream header file contains the definition of its member objects cin and cout. If you fail to include iostream in your program, an error message will occur on cin and cout; and we will not be able to get any input or send any output.

5. Why is main function special?

C++ program is a collection of functions. Every C++ program must have a main function. The main( ) function is the starting point where all C++ programs begin their execution.

Explain in detail

1. Write about Binary operators used in C++.

Binary Operators - Require two operands. C++ Operators are classified as:

Arithmetic Operators: Arithmetic operators to perform simple arithmetic operations like addition, subtraction, multiplication, division etc.,

Operator, Operation ,Example

+	Addition	10 + 5 = 15
-	Subtraction	10 – 5 = 5
*	Multiplication	10 * 5 = 50
/	Division	10 / 5 = 2
%	Modulus	10 % 3 = 1

Relational Operators: Relational operators are used to determine the relationship between its operands. When the relational operators are applied on two operands, the result will be a Boolean value.

Operator	Operation	Example
>	Greater than	a > b
<	Less than	a < b
>=	Greater than or equal to	a >= b
<=	Less than or equal to	a <= b
==	Equal to	a == b
!=	Not equal	a != b

Logical operators : C++ provides three logical operators.

Operator	Operation	Description
&&	AND	The logical AND combines two different relational expressions in to one. It returns 1 (True) if both expression are true otherwise it returns 0 (false).
||	OR	The logical OR combines two different relational expressions in to one. It returns 1 (True) if either one of the expression is true. It returns 0 (false) if both the expressions are false.
!	NOT	NOT works on a single expression / operand. It simply negates or inverts the truth value. i.e. if an operand / expression is 1 (true) then this operator returns 0 (false) and vice versa

Assignment Operator: Assignment operator is used to assign a value to a variable which is on the left hand side of an assignment statement. = (equal) is commonly used as the assignment operator in all computer programming
languages. Ex: a = 5

2. What are the types of Errors?

Syntax Error:

- Syntax is a set of grammatical rules to construct a program.
- Syntax errors occur when grammatical rules of C++ are violated.
- Example: cout << “Welcome to Programming in C++”
- As per grammatical rules of C++, every executable statement should terminate with a semicolon. But, this statement does not end with a semicolon.

Semantic Error:

- A Program has not produced expected result even though the program is grammatically correct.
- It may be happened by wrong use of variable / operator / order of execution etc.
- This means, program is grammatically correct, but it contains some logical error. So, Semantic error is also called as “Logic Error.

Run-time error:

- A run time error occurs during the execution of a program. It occurs because of some illegal operation that takes place.
- For example, if a program tries to open a file which does not exist, it results in a run-time error.

CHAPTER 9: Data Types, Variables and Expressions

Choose the correct answer:

1. How many categories of data types are available in C++?
(a) 5 (b) 4 (c) 3 (d) 2

2. Which of the following data types is not a fundamental type?
(a) signed (b) int (c) float (d) char

3. What will be the result of following statement?
char ch= ‗B‘;
cout << (int) ch;
(a) B (b) b (c) 65 (d) 66

4. Which of the character is used as suffix to indicate a floating point value?
(a) F (b) C (c) L (d) D

5. How many bytes of memory is allocated for the following variable declaration if you are using Dev C++? short int x;
(a) 2 (b) 4 (c) 6 (d) 8

6. What is the output of the following snippet?
char ch = ‗A‘; ch = ch + 1;
(a) B (b) A1 (c) F (d) 1A

7. Which of the following is not a data type modifier?
(a) signed (b) int (c) long (d) short

8. Which of the following operator returns the size of the data type?
(a) sizeof( ) (b) int ( ) (c) long ( ) (d) double ( )

9. Which operator is used to access reference of a variable?
(a) $ (b) # (c) & (d) !

10. This can be used as alternate to endl command:
(a) \t (b) \b (c) \0 (d) \n

Very Short Answers:

1. Write a short note on const keyword with an example.
const is the keyword used to declare a constant.
const keyword modifies / restricts the accessibility of a variable. So, it is known as Access modifier. For example, int num = 100;

2. What is the use of setw( ) format manipulator?
Setw() format manipulator is used to set the width of the field assigned for the output.
The field width determines the minimum number of characters to be written in output.

3. Why is char often treated as integer data type?
Character data type is often said to be an integer type, since all the characters are represented in memory by their associated ASCII Codes.
If a variable is declared as char, C++ allows storing either a character or an integer value.

4. What is a reference variable? What is its use?
A reference provides an alias for a previously defined variable. Declaration of a reference consists of base type and an & (ampersand) symbol.
Usage: Reference variable name is assigned the value of a previously declared variable.

5. Consider the following C++ statement. Are they equivalent? char ch = 67; char ch = ‘C’;
Yes, they are equivalent because ASCII code of ‘C‘ is 67.

6. What is the difference between 56L and 56?

- 56L - is a Integer Number - 4 Bytes
- 56 - is a Long Integer Number - 2 Bytes

7. Determine which of the following are valid constant? And specify their type.
(i) 0.5 (ii) "Name" (iii) "\t" (iv) 27,822
(i) 0.5 - Valid Floating Constant
(ii) "Name' - Invalid String Constant (Enclosed within Double quotes)
(iii) "\t' - Valid. Character constant
(iv) 27,822 - Invalid Decimal Constant (Commas is not allowed)

8. Suppose x and y are two double type variable that you want add as integer and assign to an integer variable. Construct a C++ statement to do the above.
Eg: x=2.5 , y=1.2 then result z=3(it must be integer)
int z;
double x,y;
z = int(x) + int(y);

9. What will be the result of following if num=6 initially.
(a) cout << num; - 6
(b) cout << (num==5); - 0

10. Which of the following two statements are valid? Why? Also write their result.
(i) int a; a = 3,014; (ii) int a; a=(3,014);
Above the two statements are Invalid.
Special Symbols are not allowed in the integer values (Commas, Open and Close Brackets)

Short Answers:

1. What are arithmetic operators in C++? Differentiate unary and binary arithmetic operators. Give example for each of them.
Arithmetic operators perform simple arithmetic operations like addition, subtraction, multiplication, division etc.,
The symbols which are used to do some mathematical or logical operations are called as Operators.
(i) Unary Operators - Require only one operand Ex: a ++
(ii) Binary Operators - Require two operands Ex: a + b

2. Evaluate the following C++ expressions where x, y, z are integers and m, n are floating point numbers. The value of x = 5, y = 4 and m=2.5;
(i) n = x + y / x;
(ii) z = m * x + y;
(iii) z *= x * m + x;

(i) n = x + y / x;	(ii) z = m * x + y;	(iii) z = (x++) * m + x;
n = 5 + (4 / 5)	z = (2.5 * 5) + 4	z = ((5++) * 2.5) + 5
n = 5 + 0.8	z =12.5 + 4	z = (5 * 2.5) + 5
n = 5.8	z = 16.5	**z = 12.5 + 5**
	z = 16 (z – is integer)	**z = 17.5**
		z=17 (z – is integer)

CHAPTER 10: Flow of Control

Choose the correct answer:

1. What is the alternate name of null statement?
(A) No statement (B) Empty statement (C) Void statement (D) Zero statement
2. In C++, the group of statements should be enclosed within:
(A) { } (B) [ ] (C) ( ) (D) < >
3. The set of statements that are executed again and again in iteration is called as:
(A) condition (B) loop (C) statement (D) body of loop
4. The multi way branch statement:
(A) if (B) if … else (C) switch (D) for
5. How many types of iteration statements?
(A) 2 (B) 3 (C) 4 (D) 5
6. How many times the following loop will execute?
for (int i=0; i<10; i++)
(A) 0 (B) 10 (C) 9 (D) 11
7. Which of the following is the exit control loop?
(A) for (B) while (C) do…while (D) if…else
8. Identify the odd one from the keywords of jump statements:
(A) break (B) switch (C) goto (D) continue
9. Which of the following is called entry control loop?
(A) do-while (B) for (C) while (D) if-else
10. A loop that contains another loop inside its body:
(A) Nested loop (B) Inner loop (C) Inline loop (D) Nesting of loop

Very Short Answers:

1. What is a null statement and compound statement?
The "null or empty statement" is a statement containing only a semicolon (;) C++ allows a group of statements enclosed by pair of braces {}. This group of statements is called as a compound statement or a block.

2. What is selection statement? write it's types?
The selection statement means the statement (s) are executed depends upon a condition. If a condition is true, a true block is executed otherwise a false block is executed. This statement is also called decision statement.
Types: If, if else, Nest if, if -else-if, The ?: Alternative to if- else, Switch statement

3. Correct the following code segment:

```
if (x=1)
p= 100;
else
p = 10;
```

Correct code :

```
    if (x==1)
        p= 100;
    else
        p = 10;
```

4. What will be the output of the following code:

```
int year;
cin >> year;
```

```
if (year % 100 == 0)
if ( year % 400 == 0)
cout << "Leap";
else
cout << "Not Leap year";
```

If the input given is (i) 2000 (ii) 2003 (iii) 2010?

Output:
(i) Leap (ii) Not Leap year (iii) Not Leap year

5. What is the output of the following code?

```
for (int i=2; i<=10 ; i+=2)
cout << i;
```

output: 2 4 6 8 10

6. Write a for loop that displays the number from 21 to 30.
coding:

```
for (int i =21; i <=30 ; i++)
cout << i <<'\t';
```

7. Write a while loop that displays numbers 2, 4, 6, 8.....20.

```
int i = 2;
while(i<=20)
{
cout << i<<' , ';
i += 2;
}
```

8. Compare an if and a ? : operator.

if	? : Operator
if the condition is true then a true-block executed, otherwise the true-block is skipped	The conditional operator (or) Ternary operator is an alternative for _if else statement'.
Syntax: if (expression) true-block; statement-x;	**Syntax:** expression 1? expression 2 : expression 3

Short Answers:
1. Convert the following if-else to a single conditional statement:

```
if (x >= 10)
a = m + 5;
else
a = m;
```

conditional statement: if (x >= 10)? a=m+5 : a=m;
(or)
a = (x>=10)? m+5 : m;

2. Rewrite the following code so that it is functional:

```
v = 5;
do;
{
```

```
total += v;
cout << total;
while v <= 10
```

correct code:

```
int v = 5;
do
{
total += v;
cout << total;
v++;
} while (v <= 10);
```

3. Write the syntax and purpose of switch statement.

syntax of switch:

```
switch(expression)
{
case constant 1: statement(s); break;
case constant 2: statement(s); break;
.
.
default: statement(s);
}
```

purpose of switch statement:

- The switch statement is a multi-way branch statement.
- It provides an easy way to dispatch execution to different parts of code based onthe value of the expression.
- The switch statement replaces multiple if-else sequence.

4. Write a short program to print following series: 1 4 7 10..... 40

```
#include<iostream>
using namespace std;
int main( )
{
for (int i=1; i<=40 ; i+=3)
cout << i<<‘ , ‘;
return 0;
}
```

Explain in detail:

1. What is an entry control loop? Explain any one of the entry controlled loop with suitable example.

In an entry-controlled loop, first the test-expression is evaluated and if it is nonzero, the body of the loop is executed otherwise the loop is terminated.

for loop :

- The for loop is a entry- controlled loop and is the easiest looping statement which allows code to be executed repeatedly.
- It contains three different statements:
  Initialization
  condition or test-expression and

update expression(s))

- The three statements are separated by semicolons.

The general syntax is:

```
for (initialization(s); test-expression; update expression(s))
{
Statement 1;
Statement 2;
……
}
Statement-x;
```

Example: C++ program to display numbers from 0 to 9 using for loop

```
#include<iostream>
using namespace std;
int main( )
{
for (int i = 0; i<10 ; i++)
cout << i<<‘ ‘;
return 0;
}
```

Output: 0 1 2 3 4 5 6 7 8 9

CHAPTER 11: Functions

Choose the correct answer:

1. Which of the following header file defines the standard I/O predefined functions ?
A) stdio.h B) math.h C) string.h D) ctype.h

2. Which function is used to check whether a character is alphanumeric or not.
A) isalpha() B) isdigit() C) isalnum() D) islower()

3. Which function begins the program execution ?
A) isalpha() B) isdigit() C) main() D) islower()

4. Which of the following function is with a return value and without any argument ?
A) x=display(int, int) B) x=display() C) y=display(float) D) display(int)

5. Which is return data type of the function prototype of add(int, int); ?
A) int B) float C) char D) double

6. Which of the following is the scope operator ?
A) > B) & C) % D) ::

Very Short Answers:

1. Define Functions.
A large program can typically be split into smaller sized blocks called a functions. Where each subprogram can perform some specific functionality.

2. Write about strlen() function.
The strlen() takes a null terminated string as its argument and returns its length. The length does not include the null(\0) character.

3. What are importance of void data type.
void type has two important purposes:
- To indicate the function does not return a value
- To declare a generic pointer.

4. What is Parameter and list its types?
Arguments or parameters are the means to pass values from the calling function to the called function.
Types:
- The variables used in the function definition as parameters are known as formal parameters.
- The constants, variables or expressions used in the function call are known as actual parameters.

5. Write a note on Local Scope.
- A local variable is defined within a block. A block of code begins and ends with curly braces { }.
- A local variable cannot be accessed from outside the block of its declaration.

Short Answers:

1. What is Built-in functions ?
- C++ provides a rich collection of functions ready to be used for various tasks.
- The tasks to be performed by each of these are already written, debugged and compiled, their definitions alone are grouped and stored in files called header files. Such ready-to-use sub programs are called pre-defined functions or built-in functions.

2. What is the difference between isupper() and toupper() functions ?

isupper()	toupper()
This function is used to check the given character is uppercase.	This function is used to convert the given character into its uppercase.
This function will return 1 if true otherwise 0.	This function will return the upper case equivalent of the given character.

3. Write about strcmp() function.
The strcmp() function takes two arguments: string1 and string2. It compares the contents of string1 and string2 lexicographically.
The strcmp() function returns:

- Positive value if the first differing character in string1 is greater than the corresponding character in string2.
- Negative value if the first differing character in string1 is less than the corresponding character in string2.
- 0 if string1 and string2 are equal.

4. What is default arguments ? Give example.
In C++, one can assign default values to the formal parameters of a function prototype. The Default arguments allow to omit some arguments when calling the function.
When calling a function,

- For any missing arguments, complier uses the values in default arguments for the called function.
- The default value is given in the form of variable initialization. Example : void defaultvalue(int n1=10, n2=100);

Explain in detail:
1. Explain Call by value method with suitable example.
Call by value method copies the value of an actual parameter into the formal parameter of the function. In this case, changes made to formal parameter within the function will have no effect on the actual parameter.

Example Program:

```
#include<iostream>
using namespace std;
void fun(int x)
{
x=20;
}
int main( )
{
int a=10;
fun(a);
cout<<a;
}
```

Output : 10

2. Explain scope of variable with example.
Scope refers to the accessibility of a variable. There are four types of scopes in C++.
1. Local scope - Inside a block which is called local variables.
2. Function scope - Inside a function is called function variables.

3. File scope - Outside of all functions which is called global variables.
4. Class scope - Inside a class is called class variable or data members.

Local Scope:

- A local variable is defined within a block. A block of code begins and ends with curly braces { }.
- A local variable cannot be accessed from outside the block of its declaration.

Function Scope:

- The scope of variables declared within a function is extended to the function block, and all sub-blocks therein.
- The life time of a function scope variable, is the life time of the function block.

File Scope:

- A variable declared above all blocks and functions (including main ( )) has the scope of a file.
- The life time of a file scope variable is the life time of a program.
- The file scope variable is also called as global variable.

Example Program:

```
#include<iostream>
using namespace std;
int sum; File Scope
void add(int x, int y)
{
int z=30 Function Scope
sum=x+y+z;
}
int main()
{
int a=10;
{
int b=20; Local Scope
add(a,b);
}
cout<<sum;
}
```

Class Scope:

- A class is a new way of creating and implementing a user defined data type. Classes provide a method for packing together data of different types.
- Data members are the data variables that represent the features or properties of a class.

Example Program:

```
class student
{
private :
int mark1, mark2, total;
};
```

CHAPTER 12: Arrays and Structures

Choose the correct answer:

1. Which of the following is the collection of variables of the same type that an referenced by a common name ?
a) int b) float c) Array d) class
2. int age[]={6,90,20,18,2}; How many elements are there in this array?
a) 2 b) 5 c) 6 d) 4
3. cin>>n[3]; To which element does this statement accept the value?
a) 2 b) 3 c) 4 d) 5
4. By default, a string ends with which character?
a) \o b) \t c) \n d) \b
5. Structure definition is terminated by
(a) : (b) } (c) ; (d) ::
6. What will happen when the structure is declared?
(a) it will not allocate any memory (b) it will allocate the memory
(c) it will be declared and initialized (d) it will be only declared
7. A structure declaration is given below.

```
struct Time
{
int hours;
int minutes;
int seconds;
}t;
```

Using above declaration which of the following refers to seconds.
(a) Time.seconds (b) Time::seconds (c)seconds (d) t. seconds
8. Which of the following is a properly defined structure?
(a) struct {int num;} (b) struct sum {int num;}
(c) struct sum int sum; (d) struct sum {int num;};
9. A structure declaration is given below.

```
struct employee
{
int empno;
char ename[10];
}e[5];
```

Using above declaration which of the following statement is correct.
(a) cout<<e[0].empno<<e[0].ename; (b) cout<<e[0].empno<<ename;
(c) cout<<e[0]->empno<<e[0]->ename; (d) cout<<e.empno<<e.ename;
10. When accessing a structure member ,the identifier to the left of the dot operator is the name of
(a) structure variable (b) structure tag
(c) structure member (d) structure function

Very Short Answers:

1. What is Traversal in an Array?
Accessing each element of an array at least once to perform any operation is known as Traversal.

2. What is Strings?
- A string is defined as a sequence of characters where each character may be a letter, number or a symbol.
- Each element occupies one byte of memory.

- Every string is terminated by a null ('\0', ASCII code 0) character

3. What is the syntax to declare two – dimensional array.
data-type array_name[row-size][col-size];

4. Define structure .What is its use?
- Structure is a user-defined which has the combination of data items with different data types.
- This allows to group of variables of mixed data types together into a single unit.

5. What is the error in the following structure definition.
struct employee{ inteno;charename[20];char dept;}
Employee e1,e2;
- Spaces are missing at two places.
- Structure name given wrongly.

Corrected Structure:

```
struct Employee
{
int eno;
char ename[20];
char dept;
} Employee e1,e2;
```

Short Answers

1. Define an Array ? What are the types?
An array is a collection of variables of the same type that are referenced by a common name. An array is also a derived data type in C++.
There are different types of arrays used in C++. They are:
- One-dimensional arrays
- Two-dimensional arrays
- Multi-dimensional arrays

2. Write note an Array of strings.
- An array of strings is a two-dimensional character array.
- The size of the first index (rows) denotes the number of strings and the size of the second index (columns) denotes the maximum length of each string.

Declaration of 2D Array: char Name[6][10];
Initialization:

```
char Name[6][10] = {"Vijay", "Raji", "Suji", "Joshini", "Murugan", "Mani"};
```

3. How to access members of a structure?Give example.
Data members are accessed by dot(.) operator.
Syntax: objectname.datamember;
The syntax for that is using a dot (.) between the object name and the member name.
For example, the elements of the structure Student can be accessed as follows:
balu.rollno
balu.age

4. What is called anonymous structure .Give an example.
A structure without a name/tag is called anonymous structure.

Ex: struct
{
long rollno;
int age;
float weight;
} student;
The student can be referred as reference name to the above structure and the elements can be accessed like student.rollno, student.age and student.weight.

CHAPTER 13: Introduction to Object Oriented Programming Techniques

Choose the correct answer:

1. The term is used to describe a programming approach based on classes and objects is
(A) OOP (B) POP (C) ADT (D) SOP
2. The paradigm which aims more at procedures.
(A) Object Oriented Programming (B) Procedural programming
(C) Modular programming (D) Structural programming
3. Which of the following is a user defined data type?
(A) class (B) float (C) int (D) object
4. The identifiable entity with some characteristics and behaviour is.
(A) class (B) object (C) structure (D) member
5. The mechanism by which the data and functions are bound together into a single unit is known as
(A) Inheritance (B) Encapsulation (C) Polymorphism (D) Abstraction
6. Insulation of the data from direct access by the program is called as
(A) Data hiding (B) Encapsulation (C) Polymorphism (D) Abstraction
7. Which of the following concept encapsulate all the essential properties of the object that are to be created?
(A) class (B) Encapsulation (C) Polymorphism (D) Abstraction
8. Which of the following is the most important advantage of inheritance?
(A) data hiding (B) code reusability (C) code modification (D) accessibility
9. —Write once and use it multiple time can be achieved by
(A) redundancy (B) reusability (C) modification D) composition
10. Which of the following supports the transitive nature of data?
(A) Inheritance (B) Encapsulation (C) Polymorphism (D) Abstraction

Very Short Answers:

1. Differentiate classes and objects.

CLASS	OBJECT
Class is a user defined data type. Class represents a group of similar objects.	Objects are the basic unit of OOP. It represents data and associated function together in to a single unit.

2. Write the disadvantages of OOP.
- Size: Object Oriented Programs are much larger than other programs.
- Effort: Object Oriented Programs require a lot of work to create.
- Speed: Object Oriented Programs are slower than other programs, because of their size.

Short Answers:

1. What is paradigm ?Mention the different types of paradigm.
- Paradigm means organizing principle of a program. It is an approach to programming.

- There are different approaches available for problem solving using computer.
  They are,
  - Procedural programming
  - Modular Programming
  - Object Oriented Programming

2. Write a note on the features of procedural programming.
   - Programs are organized in the form of subroutines or sub programs.
   - All data items are global.
   - Suitable for small sized software application.
   - Difficult to maintain and enhance the program code as any change in data type needs to be propagated to all subroutines that use the same data type. This is time consuming.

3. What do you mean by modularization and software reuse?
   - Modularisation: where the program can be decomposed into modules.
   - Software re-use: where a program can be composed from existing and new modules.

4. Define information hiding.
Encapsulation of data from direct access by the program is called data hiding or information hiding.

Explain in detail:

1. Write the differences between Object Oriented Programming and procedural programming.

Object Oriented Programming	Procedural programming
Emphasizes on data rather than algorithm	Procedural programming aims more at procedures.
It implements programs using classes and objects.	Programs are organized in the form of subroutines or sub programs.
Data and its associated operations are grouped in to single unit	All data items are global.
Programs are designed around the data being operated	Suitable for small sized software application.
Relationships can be created between similar, yet distinct data types	Difficult to maintain and enhance the program code as any change in data type needs to be propagated to all subroutines that use the same data type.
Example: C++, Java, VB.Net, Python etc.	**Example: FORTRAN and COBOL.**

2. What are the advantages of OOPs?
Advantages of OOP:
   - Re-usability: —Write once and use it multiple times‖ you can achieve this by using class.
   - Redundancy: Inheritance is the good feature for data redundancy. If you need a same functionality in multiple class you can write a common class for the same functionality and inherit that class to sub class.
   - Easy Maintenance: It is easy to maintain and modify existing code as new objects can be created with small differences to existing ones.
   - Security: Using data hiding and abstraction only necessary data will be provided thus maintains the security of data.

3. Write a note on the basic concepts that supports OOPs?

- The Object Oriented Programming has been developed to overcome the drawbacks of procedural and modular programming.
- It is widely accepted that object-oriented programming is the most important and powerful way of creating software.
- The Object-Oriented Programming approach mainly encourages:
  - Modularisation: where the program can be decomposed into modules.
  - Software re-use: where a program can be composed from existing and new modules.

Main Features of Object Oriented Programming:

- Encapsulation: The mechanism by which the data and functions are bound together into a single unit is known as Encapsulation.
- Data Abstraction: Abstraction refers to showing only the essential features without revealing background details.
- Modularity: Modularity is designing a system that is divided into a set of functional units (named modules) that can be composed into a larger application.
- Inheritance: Inheritance is the technique of building new classes (derived class) from an existing Class (base class).
- Polymorphism: Polymorphism is the ability of a message or function to be displayed in more than one form.

CHAPTER 14: Classes and objects

Choose the correct answer:

1. The variables declared inside the class are known as
(A) data (B) inline (C) method (D) attributes

2. Which of the following statements about member functions are True or False?
i) A member function can call another member function directly with using the dot operator.
ii) Member function can access the private data of the class.
(A) i)True, ii)True (B) i)False, ii)True (C) i)True, ii)False (D) i)False,ii)False

3. A member function can call another member function directly, without using the dot operator called as
(A) sub function (B) sub member (C) nesting of member function (D) sibling of member function

4. The member function defined within the class behave like ..... functions
(A) inline (B) Non inline (C) Outline (D) Data

5. Which of the following access specifier protects data from inadvertent modifications?
(A) Private (B) Protected (C) Public (D) Global

6.
```
class x
{
int y;
public:
x(int z){y=z;}
} x1[4];
int main()
{ x x2(10);
return 0;}
```
How many objects are created for the above program
(A) 10 (B) 14 (C) 5 (D) 2

7. State whether the following statements about the constructor are True or False.
i) constructors should be declared in the private section.
ii) constructors are invoked automatically when the objects are created.
(A) True, True (B) True, False (C) False, True (D) False, False

8. Which of the following constructor is executed for the following prototype ?
add display(add &); // add is a class name
(A) Default constructor (B) Parameterized constructor
(C) Copy constructor (D) Non Parameterized constructor

Very Short Answers:

1. What are called members?
- Class comprises of members. Members are classified as Data Members and Member functions.
- Data members are the data variables that represent the features or properties of a class. Data members are also called as attributes.
- Member functions are the functions that perform specific tasks in a class. Member functions are called as methods.

2. What is the difference between the class and object in terms of oop?

Class	Object
Class is a way to bind the data and its associated functions together.	The class variables are called object. Objects are also called as instance of class.

3. Write down the importance of destructor.
   - The purpose of the destructor is to free the resources that the object may have acquired during its lifetime.
   - A destructor function removes the memory of an object which was allocated by the constructor at the time of creating a object.

Explain in detail:

1. Mention the differences between constructor and destructor.

Constructor	Destructor
The constructor is executed automatically when the object is created.	The destructor is executed automatically when the control reaches the end of class scope to destroy the object.
The name of the constructor must be same as that of the class.	The Destructor has the same as that of the class prefixed by the Tilde symbol (~).
The constructor function can be overloaded.	The Destructor function can‘t be overloaded.
A constructor can have parameter (Arguments) list.	The Destructor cannot have parameter (Arguments) list.
Constructor cannot be inherited. But a derived class can call the base class constructor.	Destructor cannot be inherited.

CHAPTER 15: Polymorphism

Choose the correct answer:

1. Which of the following refers to a function having more than one distinct meaning?
(A) Function Overloading (B) Member overloading
(C) Operator overloading (D) Operations overloading

2. Which of the following reduces the number of comparisons in a program ?
(A) Operator overloading (B) Operations overloading
(C) Function Overloading (D) Member overloading

3. void dispchar(char ch='$',int size=10)
{
for(int i=1;i<=size;i++)
cout<<ch;
}
How will you invoke the function dispchar() for the following input to print $ for 10 times
(A) dispchar(); (B) dispchar(ch,size); (C) dispchar($,10); (D) dispchar(_$',10 times);

4. Which of the following is not true with respect to function overloading?
(A) The overloaded functions must differ in their signature.
(B) The return type is also considered for overloading a function.
(C) The default arguments of overloaded functions are not considered for Overloading.
(D) Destructor function cannot be overloaded.

5. Which of the following is invalid prototype for function overloading.
(A) Void fun (int x); Void fun (char ch) ; (B) Void fun (int x); Void fun (int y);
(C) Void fun (double d); Void fun (char ch); (D) Void fun (double d);Void fun (int y);

Very Short Answers:

1. What is function overloading?
The ability of the function to process the message or data in more than one form is called as function overloading.

2. List the operators that cannot be overloaded.
- Scope operator (::)
- Sizeof
- Member selector (.)
- Member pointer selector (*)
- Ternary operator (?:)

3. What is the use of overloading a function?
- Function overloading is not only implementing polymorphism but also reduces the number of comparisons in a program and makes the program to execute faster.
- Program complexity is reduced.
- It also helps the programmer by reducing the number of function names to be remembered.

Short Answers:

1. What are the rules for function overloading?
- The overloaded function must differ in the number of its arguments or data types.
- The return types of overloaded functions are not considered for overloading same data type.
- The default arguments of overloaded functions are not considered as part of the parameter list in function overloading.

2. What is operator overloading? Give some examples of operators which can be overloaded.

- The mechanism of giving special meaning to an operator is known as operator overloading.
- The term Operator overloading, refers to giving additional functionality to the normal C++ operators like +,++,-,—,+=,-=,*.<,>.

3. Discuss the benefits of constructor overloading ?

- Function overloading can be applied for constructors, as constructors are special functions of classes.
- A class can have more than one constructor with different signature.
- Constructor overloading provides flexibility of creating multiple type of objects for a class.

Explain in detail:

1. What are the rules for operator overloading?

- Precedence and associatively of an operator cannot be changed.
- No new operators can be created, only existing operators can be overloaded.
- Cannot redefine the meaning of an operator's procedure. You cannot change how integers are added. Only additional functions can be given to an operator
- Overloaded operators cannot have default arguments.
- When binary operators are overloaded, the left hand object must be an object of the relevant class.

CHAPTER 16: Inheritance

Choose the correct answer:

1. Which of the following is the process of creating new classes from an existing class
(a) Polymorphism (b) Inheritance (c) Encapsulation (d) super class
2. Which of the following derives a class student from the base class school
(a) school: student (b) class student : public school
(c) student : public school (d) class school : public student
3. The type of inheritance that reflects the transitive nature is
(A) Single Inheritance (B) Multiple Inheritance
(C) Multilevel Inheritance (D) Hybrid Inheritance
4. Which visibility mode should be used when you want the features of the base class to be available to the derived class but not to the classes that are derived from the derived class?
(A) Private (B) Public (C) Protected (D) All of these
5. Inheritance is a process of creating new class from
(A) Base class (B) abstract (C) derived class (D) Function
6. A class is derived from a class which is a derived class itself, then this is referred to as
(A) multiple inheritance (B) multilevel inheritance (C) single inheritance (D) double inheritance
7. Which amongst the following is executed in the order of inheritance?
(A) Destructor (B) Member function (C) Constructor (D) Object
8. Which of the following is true with respect to inheritance?
(A) Private members of base class are inherited to the derived class with private
(B) Private members of base class are not inherited to the derived class with private accessibility
(C) Public members of base class are inherited but not visible to the derived class
(D) Protected members of base class are inherited but not visible to the outsideclass
9. Based on the following class declaration answer the questions (from9.1 to 9.4)

```
class vehicle protected:
{ int wheels; int load;
public: public:
void input_data(float,float); void read_data(float,float)
void output_data(); void write_data(); };
protected: class bus: private heavy_vehicle {
int passenger; char Ticket[20];
}; public:
class heavy_vehicle : protected void fetch_data(char);
vehicle { void display_data(); };
int diesel_petrol;
```

9.1. Which is the base class of the class heavy_vehicle?
(a) Bus (b) heavy_vehicle (c) vehicle (d) both (a) and (c)
9.2. The data member that can be accessed from the function displaydata()
(a) passenger (b) load (c) Ticket (d) All of these
9.3. The member function that can be accessed by an objects of bus Class is
(a) input_data(), output_data() (b) read_data() ,write_data()
(c) fetch_data(), display_data() (d) All of these
9.4. The member function that is inherited as public by Class Bus
(a) input_data(), output_data() (b) read_data(), write_data()
(c) fetch_data(), display_data() (d) none of these

Very Short Answers:

1. What is inheritance?

The mechanism of deriving new class from an existing class is called inheritance.

2. What is a base class?

A class that is used as the basis for creating a new class is called a superclass or base class.

Short Answers:

1. What are the points to be noted while deriving a new class?

The following points should be observed for defining the derived class.

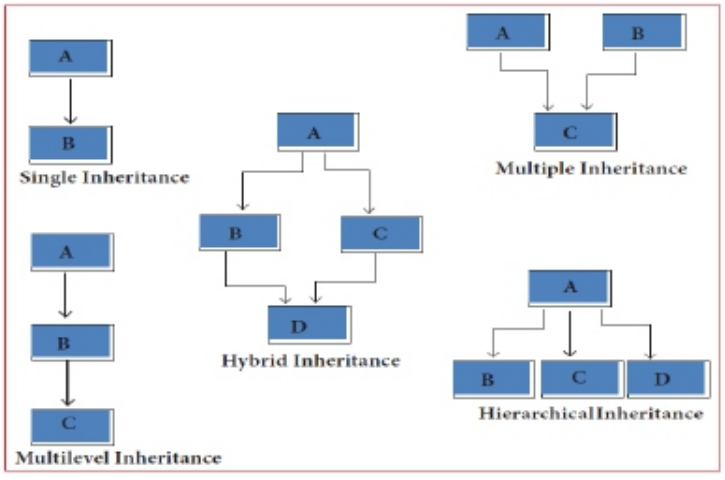
- The keyword class has to be used.
- The name of the derived class is to be given after the keyword class.
- A single colon (:).
- The type of derivation, namely private, public or protected.
- The name of the base class, if more than one base class, then it can be given separated by comma.

Explain in detail:

1. Explain the different types of inheritance.

- Single Inheritance: When a derived class inherits only from one base class, it is known as single inheritance.
- Multiple Inheritance: When a derived class inherits from multiple base classes it is known as multiple inheritance.
- Hierarchical inheritance: When more than one derived classes are created from a single base class , it is known as Hierarchical inheritance.
- Multilevel Inheritance: The transitive nature of inheritance is reflected by this form of inheritance. When a class is derived from a class which is a derived class – then it is referred to as multilevel inheritance.
- Hybrid inheritance: When there is a combination of more than one type of inheritance, it is known as hybrid inheritance.

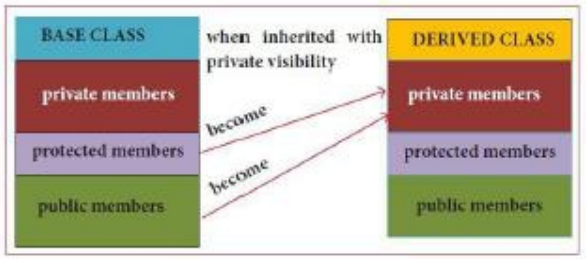
The following diagram represents the different types of inheritance



2. Explain the different visibility mode through pictorial representation.

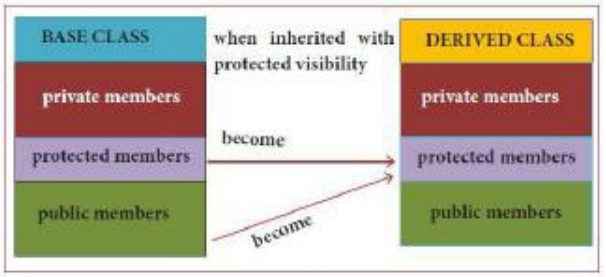
Private visibility mode:

When a base class is inherited with private visibility mode the public and protected members of the base class become „private" members of the derived class.



protected visibility mode:

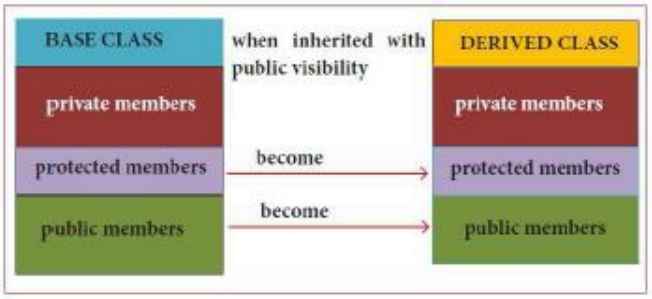
When a base class is inherited with protected visibility mode the protected and public members of the base class become 'protected' members of the derived class.



public visibility mode:

When a base class is inherited with public visibility mode , the protected members of the base class will be inherited as protected members of the derived class and the public members of the base class will be inherited as public

members of the derived class.



CHAPTER 17: Computer Ethics And Cyber Security

Choose the correct answer:

1. Which of the following deals with procedures, practices and values?
a. piracy b. programs c. virus d. computer ethics
2. Commercial programs made available to the public illegally are known as
a. freeware b. warez c. free software d. software
3. Which one of the following are self-repeating and do not require a computer program to attach themselves?
a. viruses b. worms c. spyware d. Trojans
4. Which one of the following tracks a user visits a website?
a. spyware b. cookies c. worms d. Trojans
5. Which of the following is not a malicious program on computer systems?
a. worms d. Trojans c. spyware d. cookies
6. A computer network security that monitors and controls incoming and outgoing traffic is
a. Cookies b.Virus c. Firewall d. worms
7. The process of converting cipher text to plain text is called
a. Encryption b. Decryption c. key d. proxy server
8. e-commerce means
a. electronic commerce b. electronic data exchange
c. electric data exchange d. electronic commercialization.
9. Distributing unwanted e-mail to others is called.
a. spam b. scam c. fraud d. spoofing
10. Legal recognition for transactions are carried out by
a. Electronic Data Interchange b. Electronic Data Exchange
c. Electronic Data Transfer d. Electrical Data Interchange

Very Short Answers:

1. What is harvesting?
A person or program collects login and password information from a legitimate user to illegally gain access to others' account(s).

2. What are Warez?
Commercial programs that are made available to the public illegally are often called warez.

3. Write a short note on cracking.
Cracking is where someone edits a program source so that the code can be exploited or modified.

4. Write two types of cyber attacks.
- Virus
- Worms
- Spyware
- Ransomware
- Pharming
- Phishing
- Man In The Middle (MITM)

5. What is a Cookie?
A cookie is a small piece of data sent from a website and stored on the user's computer memory (Hard drive) by the user's web browser while the user is browsing internet.

Short Answers:

1. What is the role of firewalls?
   - A firewall is a computer network security based system that monitors and controls incoming and outgoing network traffic based on predefined security rules.
   - A firewall commonly establishes a block between a trusted internal computer network and entrusted computer outside the network.

2. Write about encryption and decryption.
   - Encryption and decryption are processes that ensure confidentiality that only authorized persons can access the information.
   - Encryption is the process of translating the plain text data (plaintext) into random and mangled data (called cipher-text).
   - Decryption is the reverse process of converting the cipher-text back to plaintext. Encryption and decryption are done by cryptography.

3. What are the guidelines to be followed by any computer user?
   - Honesty: Users should be truthful while using the internet.
   - Confidentiality: Users should not share any important information with unauthorized people.
   - Respect: Each user should respect the privacy of other users.
   - Professionalism: Each user should maintain professional conduct.
   - Obey The Law: Users should strictly obey the cyber law in computer usage.
   - Responsibility: Each user should take ownership and responsibility for their actions.

4. What are ethical issues? Name some.

An Ethical issue is a problem or issue that requires a person or organization to choose between alternatives that must be evaluated as right (ethical) or wrong (unethical).
Some of the common ethical issues are listed below:
   - Cyber crime
   - Software Piracy
   - Unauthorized Access
   - Hacking
   - Use of computers to commit fraud
   - Sabotage in the form of viruses
   - Making false claims using computers

Explain in detail:

1. What are the various crimes happening using computer?

Crime	Function
Cyber Terrorism	Hacking, threats, and blackmailing towards a business or a person.
Cyber stalking	Harassing through online.
Malware	Malicious programs that can perform a variety of functions including stealing, encrypting or deleting sensitive data, altering or hijacking core computing functions and monitoring user's computer activity without their permission.
Harvesting	A person or program collects login and password information from a legitimate user to illegally gain access to others' account(s).
Spam	Distribute unwanted e-mail to a large number of internet users.
Spoofing	It is a malicious practice in which communication is sent from unknown

2. Write the different types of cyber attacks.

- Virus: A virus is a small piece of computer code that can repeat itself and spreads from one computer to another by attaching itself to another computer file.
- Worms: Worms are self – repeating and do not require a computer program to attach themselves.
- Spyware: Spyware can be installed on the computer automatically when the attachments are open, by clicking on links or by downloading infected software.
- Ransomeware: Ransomware is a type of malicious program that demands payment after launching a cyper-attack on a computer system.
- Pharming : Pharming is a scamming practice in which malicious code is installed on a personal computer or server, misdirecting users to fraudulent web sites without their knowledge or permission.
- Phishing: Phishing is a type of computer crime used to attack, steal user data, including login name, password and credit card numbers.
- Man In The Middle (MITM): Man-in-the-middle attack is an attack where the attacker secretly relays and possibly alters the communication between two parties who believe they are directly communicating with each other.

CHAPTER 18: Tamil Computing

Very Short Answers:

1. List the search engines supported by Tamil language.

Google and Bing

2. What are the keyboard layouts used in Android?

Sellinam and Ponmadal are familiar Tamil keyboard layouts that works on Android operating system in Smart phone using phonetics.

3. Write a short note about Tamil Programming Language.

Based on Python programming language, the first Tamil programming language Ezhil is designed.
With the help of this programming language, you can write simple programs in Tamil.

4. What is TSCII?

TSCII (Tamil Script Code for Information Interchange) is the first coding system to handle our Tamil language in an analysis of an encoding scheme that is easily handled in electronic devices, including non-English computers.
This encoding scheme was registered in IANA (Internet Assigned Numbers Authority) unit of ICANN.

5. Write a short note on Tamil Virtual Academy.

- With the objectives of spreading Tamil to the entire world through internet, Tamil Virtual University was established on 17th February 2001 by the Govt. of Tamilnadu.
- Now, this organisation functioning with the name —Tamil Virtual Academy‖.
- This organization offers different courses regarding Tamil language, Culture, heritage etc., from kindergarten to under graduation level.