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VIRUDHUNAGAR DISTRICT COMMON EXAMINATIONS
COMMON HALF YEARLY EXAMINATION – DECEMBER 2022
STANDARD – 11
COMPUTER SCIENCE
PART – I

I. Choose the correct answer: 15 X 1 = 15

1. c. Power on Self-Test
2. b. 16
3. d. System Software
4. i =0
5. a. Tokens
6. a. 69
7. c. {}
8. b.switch-case
9. a. 14
10. a. sum
11. a. inline
12. a. dispchar()
13. a. inheritance
14. b. decryption
15. a. Ezhil

PART – II

II. Answer ANY SIX questions. Qn.no.24 is compulsory: 6 x 2 = 12

16. What is computer?

- A **computer** is an electronic device that manipulates information, or data. It has the ability to store, retrieve, and process data.
- Computer works faster than human being and given the values more accuracy and reliable.

17. What is the use of PS/2 port and SCSI port

- **PS/2 Port:** To connect mouse and keyboard to PC.
- **SCSI Port:** To connect the hard disk drives and network connectors.

18. What is Multitasking?

Multitasking:

- Multiple applications can execute simultaneously in Windows, and this is known as **"Multitasking".**

19. What is the difference between an algorithm and a Program?

ALGORITHM	PROGRAM
An algorithm is a step-by-step sequence of statements to solve a problem.	Program refers to the code for any program that follows the basic rules of the concerned programming language.

20. Why is the main() function special?

- The main( ) function is the starting point where all C++ programs begin their execution.
- Therefore, the executable statements should be inside the main( ) function.

21. What is recursive function?

- A function that calls itself is known as recursive function. And, this technique is known as recursion.

22. What is data Abstraction?

- Abstraction refers to showing only the essential features without revealing background details.

23. What is cybercrime?

- Cybercrime is an intellectual, white-collar crime. Those who commit such crimes generally manipulate the computer system in an intelligent manner.

For example – illegal money transfer via internet.

24. Define "function overloading".

- The ability of the function to process the message or data in more than one form is called as function overloading.
- In other words function overloading means two or more functions in the same scope share the same name but their parameters are different.

PART – III

III. Answer ANY SIX questions. Qn. no. 32 is compulsory: 6 x 3=18

25. Do the following Arithmetic.

a) Find 2's complement of 10001001_2

```
        =    10001001
Add 1                1
     -------------------------
          10001010
     -------------------------
```

2's complement of 10001001_2 -- 10001010_2

b) Add: $11010101_2 + 110110_2$

```
   11010101  +
     110110
   ----------
   10100000
   ----------
```

$11010101_2 + 110110_2 = 10100000_2$

c) Subtract : $1101011_2 - 110100_2$

```
   1101011  -
    110100
   ---------
     110111
   ---------
```

$1101011_2 - 110100_2 = 110111_2$

26. What are the three levels of security provided by the security management of operating system.

The Operating System provides three levels of securities to the user.
(1) File access level (2) System level (3) Network level

File access level:

- In order to access the files created by other people, you should have the access permission.
- Permissions can either be granted by the creator of the file or by the administrator of the system.

System Level:

- System level security is offered by the password in a multi-user environment.
- Windows and Linux offer the password facility.

Network Level:

- Network security is an indefinable one.
- People from all over the world try to provide such a security.

27. Write notes on 'specification as contract'.

- Specification of an algorithm serves as a contract between the designer of the algorithm and the users of the algorithm, because it defines the rights and responsibilities of the designer and the user.
- Ensuring that the inputs satisfy the required properties is the responsibility of the user, but the right of the designer.
- The desired input-output relation is the responsibility of the designer and the right of the user.
- Importantly, if the user fails to satisfy the properties of the inputs, the designer is free from his obligation to satisfy the desired input-output relation.

28. Consider the assignment m, n:=m+3, n-1. Is p(m,n)=m+3n on invariant?

Let P(m, n) = m + 3n. Then

P(m, n) [m, n := m + 3, n — l]

= m + 3n [m, n := m + 3, n — l]

= (m + 3) + 3(n — l)

= m + 3 + 3n — 3

= m + 3n

= P(m, n)

Since (m + 3n) [m, n : = m + 3, n - 1] = m + 3n, m + 3n is an invariant of the assignment m, n := m + 3, n - 1.

29. Write a C++ program to print the following series.

3 6 9 12 15 18 21

```
#include< iostream>
using namespace std;
int main() {
 int n;
 cout<<"Enter the Value for N : ";
 cin>>n;
 for(int i = 1; i<=n; i++) {
```

```
 cout<< 3*i<<"  ";
 }
 cout<< endl;
return 0;
}
```

30. What is structure? What is the purpose for having structure?

- Structure is a user-defined which has the combination of data items with different data types.

Syntax:

```
struct structure_name
{
        type member_name1;
        type member_name2;
} reference_name;
```

- The structure provides a facility to store different data types as a part of the same logical element in one memory chunk adjacent to each other.

31. When a copy constructor can be called?

A copy constructor can be called in meny ways:

1) When an object is passed as a parameter to any of the member functions

Example void Data::putdata(Data x);

2) When a member function returns an object

Example Data getdata() {}

3) When an object is passed by reference to an instance of its own class

For example, Data d1, d2 (d1); // d2(d1) calls copy constructor

32. What do you mean by overriding?

Overriding:

- When a derived class member function has the same name as that of its base class member function, the derived class member function shadows/hides the base class's inherited function.
- This situation is called function overriding and this can be resolved by giving the base class name followed by :: and the member function name.

33. Name some organisations and their projects to develop Tamil?

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 functions with the name of "Tamil Virtual Academy".
- It offers different courses in Tamil language, Culture, heritage etc., from kindergarten to under graduation level.

Tamil Language Council, Singapore

- With the objectives of promoting the awareness and greater use of Tamil among the Singaporeans, in 2001 the council of Tamil Language was formed by the ministry of Information Communications and Arts, Govt. of Singapore. The council is called as "வளர்தமிழ்இயக்கம்".

Madurai Project

Project Madurai is an open and voluntary initiative to collect and publish free electronic editions of ancient tamil literary classics. This means either typing-in or scanning old books and archiving the text is one of the most readily accessible formats for use on all popular computer platforms.

Since its launch in 1998, Project Madurai etexts released are in Tamil script form as per TSCII encoding. Since 2004 we have started releasing etexts in Tamil unicode as well.

PART – IV

IV. Answer the following questions: **5 X 5 = 25**

34. Explain the basic components of a computer with a neat diagram.

- The computer is the combination of hardware and software.
- Hardware is the physical component of a computer like motherboard, memory devices, monitor, keyboard etc., while software is the set of programs or instructions.
- Both hardware and software together make the computer system to function.

Input Unit

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,
Central Processing Unit:

- CPU is the major component which interprets and executes software instructions.
- It also controls the operation of all other components such as memory, input and output units. It accepts binary data as input process the data according to the instructions and provides the result as output.
- The CPU has three components which are Control unit, Arithmetic and logic unit (ALU) and Memory unit.

Arithmetic and Logic Unit:

- The ALU is a part of the CPU where various computing functions are performed on data.
- The ALU performs arithmetic operations such as addition, subtraction, multiplication, division and logical operations.
- The result of an operation is stored in internal memory of CPU. The logical operations of ALU promote the decision-making ability of a computer**.**

Control UniT:
The control unit controls the flow of data between the CPU, memory and I/O devices. It also controls the entire operation of a computer.
Memory Unit :

- The Memory Unit is of two types which are primary memory and secondary memory.
- The primary memory is used to temporarily store the programs and data when the instructions are ready to execute.
- The secondary memory is used to store the data permanently.

Output Unit:
An Output Unit is any hardware component that conveys information to users in an understandable form.

Example: Monitor, Printer etc.

b) Write the theorems of Boolean Algebra.

Theorems of Boolean Algebra

Identity
A + 0 = A A . 1 = A
Complement
A + A = 1
A . A = 0
Commutative
A + B = B + A A . B = B . A
Associative
A + (B + C) = (A + B) + C A . (B . C) = (A . B) . C
Distributive
A . (B + C) = A . B + A . C A + (B . C) = (A + B) . (A + C)
Null Element
A + 1 = 1
A . 0 = 0

Involution
(A) = A

Idempotence A + A = A A . A = A

Absorption A + (A . B) = A A . (A + B) = A

3rd Distributive A + A . B = A + B

De Morgan's

A + B = A . B

(A . B) = A + B

35.a) Explain the process management algorithms in operating system.

Process management is function that includes creating and deleting processes providing mechanisms for processes to communicate and synchronize with each other.

The Operating System is responsible for the following activities associated with the process management:

Scheduling processes and threads on the CPUs Creating and deleting both user and system processes providing mechanisms for process synchronization Providing mechanisms for process communication.

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

1. FIFO (First In First Out)Scheduling:

- This algorithm is based on queuing technique.
- The process that enters the queue first is executed first by the CPU, followed by the next and so on.
- The processes are executed in the order of the queue (row).

2. SJF (Shortest Job First)Scheduling:

This algorithm works based on the size of the job being executed by the CPU. Consider two jobs A and B.

1) A = 6 kilo bytes 2) B = 9 kilo bytes. First the job "A" will be assigned and then job "B" gets its turn.

3. Round Robin Scheduling

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

Example take three jobs A, B, C.

- First the job A is assigned to CPU then job B and job C and then again A, B and C

4. Based On Priority

- The given job (process) is assigned based on a Priority.
- The job which has higher priority is processed first Take two jobs A and B.
- Let the priority of A be 5 and priority B be 7.
- Job B is assigned to the processor before job A.

b. Write the specification for the problem of testing whether a triangle (with sides a, b, c) is right angled using the square() function.

36. a) What is a loop? Explain the for loop with suitable example.

Loop:
Loop body will be executed if the condition is true otherwise the loop will not be executed.

- *for loop*
- *while loop*

for loop:
The for-loop is the easiest looping statement which allows code to be executed repeatedly.

The general syntax is: Flow chart:

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

Example Program:

```
#include <iostream>
using namespace std;
int main ()
{
int i;
for(i = 0; i< 5; i ++ )
cout<< "value of i : " <<i<<endl;
return 0;
}
```

Output

```
value of i : 0
value of i : 1
value of i : 2
value of i : 3
value of i : 4
```

b) Write notes on call by value method in function calling with suitable example.

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 display(int x)
{
int a=x*x;
cout<<"\n\n The Value inside display function (a * a):"<<a;
}
int main()
{
int a;
cout<<"\n\n Enter the Value for A :";
cin>>a;
display(a);
cout<<"\n\n The Value inside main function "<<a;
return(0);
}
```

Output :

Enter the Value for A : 5
The Value inside display function (a * a) : 25
The Value inside main function 5

37. a Write notes on the basic concepts of OOP.

Write a note on the basic concepts that support 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

- Data Abstraction
- Encapsulation
- Modularity
- Inheritance
- Polymorphism

1. Encapsulation

The mechanism by which the data and functions are bound together into a single unit is known as **Encapsulation**.
This encapsulation of data from direct access by the program is called **data hiding** or **information hiding.**

2. Data Abstraction

Abstraction refers to showing only the essential features without revealing background details. Classes use the concept of abstraction to define a list of abstract attributes and function which operate on these attributes.

3. 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.

4. Inheritance

Inheritance is the technique of building new classes **(derived class)** from an existing Class **(base class)**.

The most important advantage of inheritance is **code reusability.**

5. Polymorphism

Polymorphism is the ability of a message or function to be displayed in more than one form.

b) Explain the ways of creating objects to a class.

A class specification just defines the properties of a class. To make use of a class, the variables of that class type have to be declared. The class variables are called *object*. Objects are also called as *instance* of class.

For example

student s;

In the above statement **s** is an instance of the class **student**.

Objects can be created in two methods,

(1) Global object

(2) Local object

(1) Global Object

If an object is declared outside all the function bodies or by placing their names immediately after the closing brace of the class declaration then it is called as *Global object*. These objects can be used by any function in the program

(2) Local Object

If an object is declared with in a function then it is called *local object*.It cannot be accessed from outside the function.

38. a) What are the rules for operator overloading?

- Precedence and Associativity 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 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

b) Write notes on the types of inheritance.

There are different types of inheritance viz.,

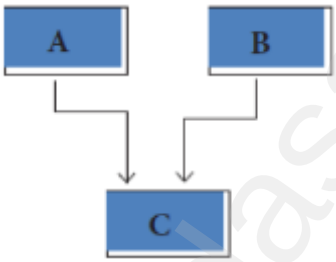
- Single inheritance
- Multiple inheritance
- Multilevel inheritance
- Hybrid inheritance
- Hierarchical inheritance

1. Single Inheritance

When a derived class inherits only from one base class, it is known as single inheritance .

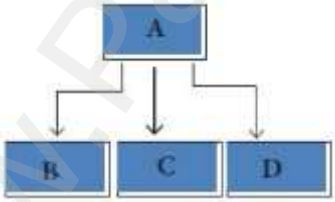
2. Multiple Inheritance

When a derived class inherits from multiple base classes it is known as multiple inheritance.



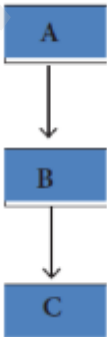
3. Hierarchical inheritance

When more than one derived classes are created from a single base class, it is Known as Hierarchical inheritance.



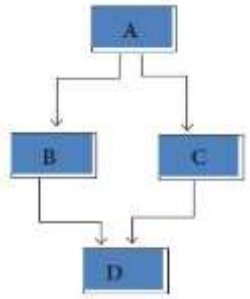
4. Multilevel Inheritance

The transitive nature of inheritance is itself 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.



5. Hybrid inheritance

When there is a combination of more than one type of inheritance, it is known as hybrid inheritance. Hence, it may be a combination of Multilevel and Multiple inheritance or Hierarchical and Multilevel inheritance or Hierarchical, Multilevel and Multiple inheritance.



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