SECOND YEAR HIGHER SECONDARY EXAMINATION 2025

FIRST TERM

ANSWER KEY

SUBJECT: COMPUTER SCIENCE

PART - I

(Answer any 5 questions, each carries 1 score.)

1. _____ is the keyword used to declare a structure in C++?

Answer:

`struct`

2. Which operator is used to access structure members via a pointer?

Answer:

Arrow operator (`->`)

3. Showing only the essential features and hiding complexities from outside world refers to_____.

Answer:

Data abstraction

4. Attempting to insert in an already full stack leads to _____.

Answer:

Stack Overflow

5. Default port number for HTTPS is ____.

Answer:

443

6. Name the data structure that follows FIFO principle.

(a) Stack (b) Queue (c) Array (d) Linked List

Answer:

(b) Queue

PART - II

(Answer any 9 questions, each carries 2 scores.)

7. Explain the difference between declaring a pointer to a structure and accessing structure members using the pointer.

Answer:

Declaration: `struct_name *ptr;`

Accessing members: Use `ptr->member` or `(*ptr).member`

8. Read the following C++ statements:

```
int *p, a=5;
p=&a;
```

(i) What is the specialty of the variable p ? (1)

(ii) What will be the content of p after the execution of second statement ? (1)

Answer:

(i) `p` is a pointer variable.

(ii) `p` contains the address of variable `a`.

9. Orphaned memory blocks are undesirable. How can they be avoided?

Answer:

Dynamic memory can be allocated using new operator. After allocation, sometimes memory block may be left unused and not released for further use. This memory block is called orphaned memory. It can be avoided by the proper use of delete operator, which releases the memory for reallocation.

10. Differentiate between data abstraction and data encapsulation.

Answer:

Data Abstraction: Showing only the essential features and hiding complexities from outside world.

Data Encapsulation: Wrapping data and functions into a single unit (class).

11. What is the difference between structure and class ?

Answer:

Structure: Default public access. Includes specifications regarding data, Declared using the keyword ' struct '

Class: Default private access. includes specification regarding both data and functions that use the data, Declared using the keyword ' class'

12. What is polymorphism. Give an example.

Answer:

Polymorphism refers to the ability of a programming language to process objects differently depending on their data type or class.

Example: Function overloading.

13. Linked list usually do not have the problem of overflow. Discuss.

Answer:

Linked lists use dynamic memory allocation, so they can grow as needed without overflow.

14. Write an algorithm to perform insertion operation in a Queue.

Answer:

step 1: if (rear= =Max-1)

step 2: Print "Overflow"

step 3: Else

step 4: Rear++;

step 5: Queue[Rear] = item

15. Write short notes on Linked list.

Answer:

A linked list is a linear data structure where elements are linked using pointers. It supports dynamic memory allocation.

16. List different types of tags in HTML with example?

Answer:

Tags that require opening tags as well as closing tags are known as **container tags**.

Eg: <html>……</html>, …..

Tags that do not require closing tags are known as **empty tags.**
Eg: <br>,<img>

17. How will you distinguish a static web page from a dynamic web page?

Answer:

Static web page	Dynamic web page
The content and layout of a web page is fixed.	The content and layout may change during run time.
Static web pages never use databases.	Database is used to generate dynamic content through queries.
Static web pages directly run on the browser and do not require any server side application program.	Dynamic web page runs on the server side application program and displays the results.
Static web pages are easy to develop.	Dynamic web page development requires programming skills.

18. Classify the following scripting languages into client side and server side:

ASP, JavaScript, PHP, VBScript

Answer:

Client-side: JavaScript, VBScript

Server-side: ASP, PHP

PART - III

(Answer any 9 questions, each carries 3 scores.)

19. (i) In C++, define a structure named 'student' with rollno, name and mark as its members. (1)

(ii) State the advantages of using structures over arrays. (2)

Answer:

(i)

```
struct student
    {       int rollno;
            char name[20];
            int mark;
    };
```

(ii)

- Structures can hold different data types.
- Reduces complexity of program

20. What is a pointer in C++? Declare a pointer and initialize with the name of your country.

Answer:

Pointer: Variable that stores memory address.

Declaration:

```
char *ptr = "India";
```

21. Explain different memory allocations used in C++?

Answer:

Static Memory: Fixed at compile time. The required memory is allocated before the execution of the program

Dynamic Memory: Allocated at runtime using `new` and `delete`. Memory is allocated during execution

22. What is the object oriented programming paradigm? Give any two advantages?

Answer:

In object oriented paradigm data and functions that operate on that data is tied together as a single unit called an object.

Advantages of OOP:

1. It can be used to implement real life scenarios

2. It is good for defining abstract data types

23. Differentiate between client side scripting and server side scripting.

Answer:

Client side scripting	Server side scripting
Script is copied to the client browser	Script remains in the web server
Script is executed in the client browser	Script is executed in the web server and the web page produced is returned to the client browser

24. Explain different types of inheritances which use more than two classes.

Answer:

Multiple Inheritance: Class inherits from more than one base class.

Hierarchical Inheritance: Multiple classes inherit from a single base class.

25. A program is implemented to find the area of a circle and the area of a rectangle with two functions having the same name but with different signature.

(a) Name the concept (1)

(b) Explain this concept (2)

Answer:

(a) Function Overloading/polymorphism

(b) Functions with same name but different parameters.

```
float area(float r)
{ return 3.14 * r * r ; }

                        float area(float a, float b)
                        { return a*b ; }
```

26. Explain about operations performed on STACK data structure.

Answer:

Push: It is the process of inserting a new data item into the stack at Top position. Once the stack is full and if we attempt to insert an item, an impossible situation arises, known as stack overflow.

Pop: It is the process of deleting an element from the top of a stack. If we try to delete an item from an empty stack, an unfavorable situation arises, known as stack underflow.

27. Write an algorithm to add a new item into a queue.

Answer:

Step 1: if (Rear < N -1) Then

Step 2: Rear = Rear + 1

Step 3: Q [Rear] = Val

Step 4: else

Step 5: Print " Queue Overflow "

28. Write HTML code for a web page of an institution with the following features. It should have a marquee welcoming users, a heading in different fonts and a picture and address of the institution.

Answer:

```
<html>
<body>
<marquee>Welcome to Our Institution!</marquee>
<h1><font face="Ariel narrow" size=30>Our Institution</font></h1>
<img src="institute.jpg">
</body>
</html>
```

29. (a) Name the different types of communication on the web and explain briefly. (2)

(b) What is a web server? (1)

Answer:

(a) There are wo types of communication on web:

Client to server communication: When the client request a webpage, the server sends a ssl certificate. If the certificate is valid, then browser starts an encrypted session with the server.

Server to Server Communication: Server to server communication is required in some applications such as online shopping where web server need to send confidential information to a bank server.

(b) Web Server: Server computer that hosts websites is called Webserver. A webserver software is installed in a server computer to make it webserver.

PART - IV

(Answer any 2 questions, each carries 5 scores.)

30. (i) An HTML document is saved with a name having _____ extension (1)

(ii) Write name and meaning of any two attributes of <BODY> tag. (2)

(iii) Write HTML code segment to display H2SO4. (2)

Answer:

(i) `.html` or `.htm`

(ii)

- `bgcolor`: Sets background color.
- `text`: Sets text color.

(iii)`H<sub>2</sub>SO<sub>4</sub>`

31. (a) Read the following code fragment:

```
int a[] = {5, 10, 15, 20, 25};
int *p = a;
```

Predict the output of the following statements:

```
cout << *p;
cout << *p+1;
cout << *(p+1);
```
(3)

(b) What is self referential structure? (2)

Answer:(a)

- `cout << *p;` → 5
- `cout << *p+1;` → 6
- `cout << *(p+1);` → 10

(b) Self-referential structure: Self referential structure is a structure in which one of the elements is a pointer to the same structure. A location of this type structure contains data and address of another location of the same type. It can be extended as per the requirement.

32. a. What is data structure? (1)

b. Explain operations on data structures (4)

Answer:

(a) Data Structure is the way of organizing same or different logically related data items which can be processed as a single unit.

(b) Operations:

The operations performed on data structures are traversing, searching, inserting, deleting, sorting and merging.

Traversing is an operation in which each element of a data structure is visited.

Searching is the process of finding the location of a particular element in a data structure.

Insertion is the operation in which a new data is added at a particular place in a data structure.

Deletion is the operation in which a particular element is removed from the data structure.

Sorting is the technique of arranging the elements in a specified order (ascending or descending).

Merging is the process of combining elements of two sorted data structures to form a new one.
