Part I (1 Mark Each)

1. **Inserting a new element into a Stack data structure is called _____ operation.**
   Answer: Push
2. **Name the tag which has the attribute 'noresize'.**
   Answer: <frame>
3. **The keyword used to define a variable in JavaScript is _____.**
   Answer: var
4. **Write the symbol of concatenating assignment operator in PHP.**

   Answer: .=
5. **Define the term Robotics.**
   Answer: Robotics is the branch of technology that deals with the design, construction, operation, and application of robots.
6. **A legal right given for the creator of an original work is _____.**
   Answer: copyright

Part II (2 Marks Each)

7. **i) Orphaned memory blocks are undesirable related with pointers in C++. Justify. (1)**
   Answer: Orphaned memory blocks occur when memory is allocated but not properly deallocated, leading to memory leaks. This can cause the program to consume more memory over time, eventually leading to system slowdown or crashes.
   ii) How can they be avoided? (1)
   Answer: Orphaned memory blocks can be avoided by ensuring proper deallocation of memory using delete in C++ or by using smart pointers that automatically manage memory.
8. **Compare different types of tags available in HTML.**
   Answer:

- **Container Tags:** Tags that require opening tag as well as closing tag are known as container tags. Eg: <HTML>, <BODY>
- **Empty Tags:** Tags that require only opening tag is known as empty tags. Eg: <BR>, <IMG>, <HR>

9. **How can we add comments in an HTML document?**
   Answer: Comments in HTML can be added using the syntax <!-- Comment -->. Comments are not displayed in the browser but are useful for documenting the code.

10. **Differentiate Cellspacing and Cellpadding.**
    Answer:

    - o **Cellspacing:** It defines the space between cells in a table.
    - o **Cellpadding:** It defines the space between the content of a cell and its border.

11. **Classify the following values in Javascript into suitable datatypes.**
    Answer:

    - o "123": String
    - o 567: Number
    - o false: Boolean
    - o "true": String

12. **Write names of any four events in JavaScript.**
    Answer:

    - **onClick** Occurs when the user clicks on an object
    - **onMouseEnter** Occurs when the mouse pointer is moved onto an object
    - **onMouseLeave** Occurs when the mouse pointer is moved out of an object
    - **onKeyDown** Occurs when the user is pressing a key on the keyboard
    - **onKeyUp** Occurs when the user releases a key on the keyboard

13. **What is webhosting? Write names of different types of webhosting.**
    Answer:

    - o **Webhosting:** It is the service of providing storage space in a web server to serve files for a website.
    - o **Types of Webhosting:** Shared hosting, VPS hosting, Dedicated hosting

14. **Write the need for applying responsive web design while developing websites today.**
    Answer:

    - o **Device Compatibility:** Ensures the website works on various devices (desktop, tablet, mobile).
    - o **User Experience:** Improves user experience by adapting the layout to different screen sizes.

15. **List any four advantages of DBMS.**
    Answer:

    - o **Data Integrity:** Ensures data accuracy and consistency.
    - o **Data Security:** Provides controlled access to data.
    - o **Data Sharing:** Allows multiple users to access data simultaneously.
    - o **Backup and Recovery:** Provides mechanisms for data backup and recovery.

16. **Write the difference between WHERE clause and HAVING clause in SQL.**
    Answer:

    - o **WHERE Clause:** Used to filter rows before grouping (used with SELECT, UPDATE, DELETE).
    - o **HAVING Clause:** Used to filter groups after grouping (used with GROUP BY).

17. **What is the difference between echo and print in PHP?**
    Answer:

    - o **echo:** Can output multiple strings, does not return a value, and is slightly faster.
    - o **print:** Can output only one string, returns a value (1), and is slower than echo.

18. **List the special data types available in PHP.**
    Answer:
    - NULL
    - Resource
    - Array
    - Object

Part III (3 Marks Each)

19. **i) Define a structure in C++. (1)**
    Answer: A structure in C++ is a user-defined data type that allows grouping of variables of different data types under a single name.
    ii) Discuss any two differences between array and structure. (2)
    Answer:
    - **Array:** Contains elements of the same data type.
    - **Structure:** Can contain elements of different data types.
    - **Array:** Elements are accessed using indices.
    - **Structure:** Elements are accessed using dot operator.

20. **i) Read the following code fragment.**
    int a[ ]= {5, 10, 15, 20, 25};
    int *p = a;
    Predict the output of the following statements.
          cout<<* (p+2);
    Answer: 15
    ii) What is the difference between the two declaration statements given below?
    a) int *ptr = new int(10);
    b) int *ptr = new int[10];
    Answer:
    int *ptr = new int(10); allocates memory for a single integer and initializes it to 10.
    int *ptr = new int[10]; allocates memory for an array of 10 integers.

21. **Define Inheritance. List the different forms of inheritance.**
    Answer:
    - **Inheritance:** It is a mechanism in OOP that allows a class to inherit properties and behaviors from another class.
    - **Forms of Inheritance:** Single, Multiple, Multilevel, Hierarchical, Hybrid.

22. **Write an algorithm to insert an element into a queue.**
    Answer:
        step 1: if (rear= =Max-1)
        step 2: Print "Overflow"
        step 3: Else

step 4: Rear++;

step 5: Queue [Rear] = item

19. **i) Name the data structure where memory allocation is done only at the time of execution.**
    Answer: Dynamic Data Structure (e.g., Linked List).
    ii) Write a note on circular queue. What is its advantage?
    Answer:
    - **Circular Queue:** A queue where the last element is connected to the first element, forming a circle.
    - **Advantage:** Efficient use of memory as it reuses the empty spaces created after dequeuing.

20. **a) Define an attribute in HTML.**
    Answer: An attribute provides additional information about an HTML element and is always specified in the start tag.
    b) Write names of any two attributes of <BODY> tag.
    Answer: bgcolor, text, background
    c) Write the use of attribute 'Alt' with <IMG>.
    Answer: The alt attribute specifies alternative text for an image if it cannot be displayed.

21. **Prepare a note on CSS.**
    Answer:
    - **CSS (Cascading Style Sheets):** Used to style and layout web pages.
    - **Types:** Inline, Internal, External.
    - **Advantages:** Separation of content and design, consistent styling across multiple pages.

22. **Explain about different ways to add scripts to a webpage.**
    Answer:

    There are three ways to insert JavaScript in a web page.
    1) Inside <head>- As the body section of the HTML page contains large volume of text, this is said to be the best practice. This avoids the confusion of web designer.
    2) Inside <body>- Here, the script will be executed while the contents of the web page are being loaded.
    3) As an external JavaScript file with explanations – Here, the .js file is linked to the HTML file as an external file.

23. **Define the terms primary key, candidate key, and alternate key in DBMS.**
    Answer:
    - **Primary Key:** A unique identifier for a record in a table.
    - **Candidate Key:** A set of attributes that can uniquely identify a record.
    - **Alternate Key:** A candidate key that is not chosen as the primary key.

24. **With suitable example, explain the Cartesian product operation.**
    Answer:
    - **Cartesian Product:** Combines each row of the first table with each row of the second table.
    - **Example:** If Table A has 2 rows and Table B has 3 rows, the Cartesian product will have 6 rows.

25. **Write notes on different Cloud service models.**

    Answer:

    1. **SaaS (Software as a Service)** : A SaaS provider gives subscribers access to both resources and applications. Here, a complete application is supplied as a service.

    2. **PaaS (Platform as a Service)** : A PaaS system goes above the SaaS setup. PaaS gives access to the components that they require to develop and operate applications over internet.

    3. **IaaS (Infrastructure as a Service)** : IaaS provides basic storage and computing capabilities as standardized services over the internet.

Part IV (5 Marks Each)

30. **Write HTML code to display the following details in the centre of a webpage using appropriate tags.**

    Components of a Computer
    - Hardware
        1. VO Devices
        2. RAM
        3. Hard Disk
    - Software
        4. Operating system
        5. Application programs.

    Answer:

```html
<html>
<body>
<center>
   <h1>Components of a Computer</h1>
   <ul>
      <li>Hardware</li>
        <ol>
           <li>I/O Devices</li>
           <li>RAM</li>
           <li>Hard Disk</li>
        </ol>
      <li>Software</li>
        <ol start="4">
           <li>Operating system</li>
           <li>Application programs</li>
        </ol>
   </ul>
</center>
```

```
</body>
</html>
```

31. **Write suitable queries in SQL to:**

a) Construct a table called EMP with attributes ECODE, ENAME, GENDER, SALARY with ECODE as Primary key of the table.

Answer:

```
CREATE TABLE EMP
(
    ECODE INT PRIMARY KEY,
    ENAME VARCHAR(50),
    GENDER CHAR(1),
    SALARY INT
);
```

b) Display the details of employees from the table EMP.

Answer:

```
SELECT * FROM EMP;
```

c) Display the details of employees who drawn salary more than 10000 from the table EMP.

Answer:

```
SELECT * FROM EMP WHERE SALARY > 10000;
```

d) Modify the SALARY of employee with 12000 whose ECODE 101.

Answer:

```
UPDATE EMP SET SALARY = 12000 WHERE ECODE = 101;
```

32. **i) Define the term e-learning.**

Answer: E-learning refers to the use of electronic technologies to access educational curriculum outside of a traditional classroom.

ii) Write notes about any two e-learning tools.

Answer:

e-Learning tools:
Electronic books reader (e-Books),
e-Text,
Online chat,
e-Content,
Educational TV channels.

iii) Discuss the advantages of e-learning.

Answer:

• Cost for learning is much less.

• It provides facility to do online courses from various nationally or internationally reputed institutions.

• Time and place is not a constraint for e-Learning.