**Assignment-5**

**Q.1) What is PHP Explain its Feature?**

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* **PHP** (recursive acronym for PHP: Hypertext Preprocessor ). PHP is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML. PHP is a server scripting language, and a powerful tool for making dynamic and interactive Web pages. PHP is a widely-used, free, and efficient alternative to competitors such as Microsoft's ASP. PHP was created by Rasmus Lerdorf in 1994 but appeared in the market in 1995. PHP 7.4.0 is the latest version of PHP, which was released on 28 November.
* **Feature of PHP:**

1. **Performance:** PHP script is executed much faster than those scripts which are written in other languages such as JSP and ASP. PHP uses its own memory, so the server workload and loading time is automatically reduced, which results in faster processing speed and better performance.
2. **Open Source:** PHP source code and software are freely available on the web. You can develop all the versions of PHP according to your requirement without paying any cost. All its components are free to download and use.
3. **Familiarity with syntax:** PHP has easily understandable syntax. Programmers are comfortable coding with it.
4. **Embedded:** PHP code can be easily embedded within HTML tags and script.
5. **Platform Independent:** PHP is available for WINDOWS, MAC, LINUX & UNIX operating system. A PHP application developed in one OS can be easily executed in other OS also.
6. **Database Support:** PHP supports all the leading databases such as MySQL, SQLite, ODBC, etc.
7. **Error Reporting:** PHP has predefined error reporting constants to generate an error notice or warning at runtime. E.g., E\_ERROR, E\_WARNING, E\_STRICT, E\_PARSE.
8. **Loosely Typed Language:** PHP allows us to use a variable without declaring its datatype. It will be taken automatically at the time of execution based on the type of data it contains on its value.
9. **Web servers Support:** PHP is compatible with almost all local servers used today like Apache, Netscape, Microsoft IIS, etc.
10. **Security:** PHP is a secure language to develop the website. It consists of multiple layers of security to prevent threads and malicious attacks.
11. **Control:** Different programming languages require long script or code, whereas PHP can do the same work in a few lines of code. It has maximum control over the websites like you can make changes easily whenever you want.
12. **11)A Helpful PHP Community:** It has a large community of developers who regularly updates documentation, tutorials, online help, and FAQs. Learning PHP from the communities is one of the significant benefits.

**Q.2) Short note on PHP Expressions?**

* **PHP expression:** Almost everything in a PHP script is an expression. Anything that has a value is an expression. A regular expression is a sequence of characters that forms a search pattern. When you search for data in a text, you can use this search pattern to describe what you are searching for. Regular expressions can be used to perform all types of text search and text replace operations. In a typical assignment statement ($x=100), a literal value, a function or operands processed by operators is an expression, anything that appears to the right of assignment operator (=).
* **Example:**

$x=100; //100 is an expression

$a=$b+$c; //b+$c is an expression

$c=add($a,$b); //add($a,$b) is an expresson

$val=sqrt(100); //sqrt(100) is an expression

$var=$x!=$y; //$x!=$y is an expression

* **Regular Expression Functions:** PHP provides a variety of functions that allow you to use regular expressions. -The preg\_match(), preg\_match\_all() and preg\_replace() functions are some of the most commonly used ones.

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| **Function** | **Description** |
| **preg\_match()** | Returns 1 if the pattern was found in the string and 0 if not |
| **preg\_match\_all()** | Returns the number of times the pattern was found in the string, which may also be 0 |
| **preg\_replace()** | Returns a new string where matched patterns have been replaced with another string |

* **Regular Expression Patterns:** Brackets are used to find a range of characters:

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| **Expression** | **Description** |
| **[abc]** | Find one character from the options between the brackets |
| **[^abc]** | Find any character NOT between the brackets |
| **[0-9]** | Find one character from the range 0 to 9 |

**Q.3) Explain about PHP control statements?**

* **PHP control statements:**Control statements are conditional statements that execute a block of statements if the condition is correct. The statement inside the conditional block will not execute until the condition is satisfied.
* **Types** The If statement, The ? Operator, The switch statement, Loops, exit, die and return, exceptions, Declare.
* **The If statement:**

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| if(expression1)  {    Only exceutes when the ic condition is correct.  }  elseif(expression2)  {    Executed when the if expression1    is false and the expression 2 is true.  }  else  {    Executed only when the both if block are false.  } |

* **? operator:** It is represented as a ternary operator and it is used as a conditional operator. It is mainly evaluated to either false or true. If false the expression next to the ternary operator is executed or else expression between the ternary operator and colon is executed.
* **condition expresion ? true : false;** It is mainly used to reduce the size of the code or else if can be used to reduce the complexity.
* **Switch statement:** Switch has many expressions and the condition is checked with each expression inside the switch. There is a default statement in the switch which can be used in the else statement and both have the same functionality and execute in the same way. A case is a beginning part for execution. **Switch statement:**

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| <?php    $day = date(" l ");    switch($day)    {     case "monday":         print($day);         break;    case "tuesday"        print($day);        break;    case "wednesday":       print($day);       break;    case "thursday":       print($day);       break;    case "friday":       print($day);       break;    case "saturday":       print($day);       break;  default:    print($day);  }?> |

**Q.4) Write PHP Array & Function?**

* **PHP Indexed Array:** PHP index is represented by number which starts from 0. We can store number, string and object in the PHP array. All PHP array elements are assigned to an index number by default. There are following ways to define indexed array:
* $season=array("summer","winter","spring","autumn");
* PHP Associative Array
* We can associate name with each array elements in PHP using => symbol.
* $salary=array("Sonoo"=>"350000","John"=>"450000","Kartik"=>"200000");

PHP multidimensional array is also known as array of arrays. It allows you to store tabular data in an array. PHP multidimensional array can be represented in the form of matrix which is represented by row \* column.

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| **Definition**  $emp = array  (   array(1,"sonoo",400000),   array(2,"john",500000),   array(3,"rahul",300000)    ); |

* **PHP provides us with two major types of functions:**

**1) Built-in functions** : PHP provides us with huge collection of built-in library functions. These functions are already coded and stored in form of functions. To use those we just need to call them as per our requirement like, var\_dump, fopen(), print\_r(), gettype() and so on.

**2) User Defined Functions** : Apart from the built-in functions, PHP allows us to create our own customised functions called the user-defined functions.  Using this we can create our own packages of code and use it wherever necessary by simply calling it.

**Q.5) Describe PHP File Handling?**

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| **Ex:** <?php  $handle = fopen("c:\\folder\\file.txt", "r");  ?> |

* **PHP File Handling:** PHP File System allows us to create file, read file line by line, read file character by character, write file, append file, delete file and close file.
* **PHP Open File - fopen():** The PHP fopen() function is used to open a file.

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| **Syntax:** fclose ( resource $handle)  ?php  fclose($handle);  ?> |

**Syntax:resource fopen ( string $filename , string $mode [, bool $use\_include\_path = false [, resource $context ]] )**

* **PHP Close File - fclose():** The PHP fclose() function is used to close an open file pointer.
* **PHP Read File - fread():** The PHP fread() function is used to read the content of the file. It accepts two arguments: resource and file size.
* **Syntax:** string fread ( resource $handle , int $length )

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| **Ex:**  <?php  $filename = "c:\\myfile.txt";  $handle = fopen($filename, "r");//open file in read mode    $contents = fread($handle, filesize($filename));//read file    echo $contents;//printing data of file  fclose($handle);//close file  ?> | **Output:** hello php file |

* **PHP Write File - fwrite():** The PHP fwrite() function is used to write content of the string into file.

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| **Syntax:**  int fwrite ( resource $handle , string $string [, int $length ] )  **Ex:**  <?php  $fp = fopen('data.txt', 'w');//open file in write mode  fwrite($fp, 'hello ');  fwrite($fp, 'php file');  fclose($fp);    echo "File written successfully";  ?> | **Output:**  File written successfully |

* **PHP Delete File - unlink():** The PHP unlink() function is used to delete file.

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| **Syntax:**  bool unlink ( string $filename [, resource $context ]**)** | **Ex:**  <?php  unlink('data.txt');     echo "File deleted successfully";  ?> |

* **PHP Open File:** PHP fopen() function is used to open file or URL and returns resource. The fopen() function accepts two arguments: $filename and $mode. The $filename represents the file to be opended and $mode represents the file mode for example read-only, read-write, write-only etc.

**Syntax:**resource fopen ( string $filename , string $mode [, bool $use\_include\_path = false [, resource $context ]] )

**Q.6) Explain PHP  cookies & session tracking with syntax?**

* **PHP  cookies:** A cookies in PHP is a small file with a maximum size of 4KB that the web server stores on the client computer. They are typically used to keep track of information such as a username that the site can retrieve to personalize the page when the user visits the website next time. A cookie can only be read from the domain that it has been issued from. Cookies are usually set in an HTTP header but JavaScript can also set a cookie directly on a browser.
* **Setting Cookie In PHP:** To set a cookie in PHP, the setcookie() function is used. The setcookie() function needs to be called prior to any output generated by the script otherwise the cookie will not be set.
* **Below are some operations that can be performed on Cookies in PHP:**
* **Creating Cookies:** Creating a cookie named Auction\_Item and assigning the value Luxury Car to it. The cookie will expire after 2 days(2 days \* 24 hours \* 60 mins \* 60 seconds).
* **Example**: This example describes the creation of the cookie in PHP.

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| <!DOCTYPE html>  <?php      setcookie("Auction\_Item", "Luxury Car", time() + 2 \* 24 \* 60 \* 60);  ?>  <html>  <body>      <?php          echo "cookie is created."      ?>      <p>          <strong>Note:</strong>          You might have to reload the          page to see the value of the cookie.      </p>    </body>  </html> | **Output:**    **PHP Delete Cookie:** If you set the expiration date in past, cookie will be deleted.  **Ex:** <?php  setcookie ("CookieName", "", time() - 3600);// set the expiration date to one hour ago  ?> |

* **PHP session tracking:** A session is a way to store information (in variables) to be used across multiple pages. Unlike a cookie, the information is not stored on the users computer.
* **PHP Session:** When you work with an application, you open it, do some changes, and then you close it. This is much like a Session. The computer knows who you are. It knows when you start the application and when you end.
* **Start a PHP Session:** A session is started with the session\_start() function. Session variables are set with the PHP global variable: $\_SESSION. Now, let's create a new page called "demo\_session1.php". In this page, we start a new PHP session and set some session variables:

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| **Example:**  <?php // Start the session session\_start(); ?> <!DOCTYPE html> <html> <body> <?php // Set session variables $\_SESSION["favcolor"] = "green"; $\_SESSION["favanimal"] = "cat"; echo "Session variables are set."; ?> </body> </html> |

**Q.7) Write database connectivity code when you use MySQL with PHP?**

* **MySQL with PHP:** is an open-source relational database management system (RDBMS). It is the most popular database system used with PHP. MySQL is developed, distributed, and supported by Oracle Corporation. Connecting to MySQL database using PHP: Using MySQLi object-oriented procedure: We can use the MySQLi object-oriented procedure to establish a connection to MySQL database from a PHP script.
* **Syntax:**

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| <?php  $servername = "localhost";  $username = "username";  $password = "password";  **// Creating connection**  $conn = new mysqli($servername, $username, $password);  **// Checking connection**  if ($conn->connect\_error) {  die("Connection failed: " . $conn->connect\_error);  }  echo "Connected successfully";  ?> |
| **Output: Connected Successfully** |

**Q.8) What is WML with program structure?**

* **WML ( Wireless Markup Language):** The topmost layer in the WAP (Wireless Application Protocol) architecture is made up of WAE (Wireless Application Environment), which consists of WML and WML scripting language.WML stands for Wireless Markup Language. WML is an application of XML, which is defined in a document-type definition.WML is based on HDML and is modified so that it can be compared with HTML.WML takes care of the small screen and the low bandwidth of transmission.WML is the markup language defined in the WAP specification.WAP sites are written in WML, while web sites are written in HTML. WML is very similar to HTML. Both of them use tags and are written in plain text format.

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| * **WML Program Structure:** |
| <?xml version="1.0"?>  <!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.2//EN"  "http://www.wapforum.org/DTD/wml12.dtd">   <wml>  <card id="one" title="First Card">  <p>  This is the first card in the deck  </p>  </card>  <card id="two" title="Second Card">  <p>  Ths is the second card in the deck  </p>  </card>  </wml> |

**Q.9) Short about WAP & simple prog. with its vulnerabilities?**

* **WAP (Wireless Application Protocol):** WAP is a source code static analysis and data mining tool to detect and correct input validation vulnerabilities in web applications written in PHP (version 4.0 or higher). WAP detects and corrects the following vulnerabilities:

1. SQL Injection (SQLI)
2. Cross-site scripting (XSS)
3. Remote File Inclusion (RFI)
4. Local File Inclusion (LFI)
5. Directory Traversal or Path Traversal (DT/PT)
6. Source Code Disclosure (SCD)
7. OS Command Injection (OSCI)
8. PHP Code Injection

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| * **A simple WAP page using PHP:** |
| <? header("Content-Type: text/vnd.wap.wml"); echo "<?xml version="1.0"?>"; echo "<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN" "http://www.wapforum.org/DTD/wml\_1.1.xml">"; ?> <wml> <card id="hello"> <p>Today is <? echo date("m/d/Y"); ?> </p> </card> </wml> |

**Q.10) What is ASP & draw NET framework components?**

* **ASP stands for Active Server Pages:** ASP is a development framework for building web pages. The ASP Technology ASP and ASP.NET are server side technologies. Both technologies enable computer code to be executed by an Internet server. When a browser requests an ASP or ASP.NET file, the ASP engine reads the file, executes any code in the file, and returns the result to the browser.
* **ASP.NET provides three development styles for creating web applications:** Web Forms.ASP.NET MVC. ASP.NET Web Pages.
* **ASP.NET Web Pages:** ASP.NET Web Pages is an SPA application model (Single Page Application).The SPA model is quite similar to PHP and Classic ASP.ASP.NET Web Pages is being merged into the new ASP.NET Core.
* **Web Forms:** It is an event driven development framework. It is used to develop application with powerful data access. It provides server side controls and events to create web application. It is part of the ASP.NET framework.
* **ASP.NET MVC:** It gives us a MVC (Model View Controller), patterns-based way to build dynamic websites. It enables a clean separation of concerns and that gives you full control over markup for enjoyable, agile development. It also provides many features that enable fast development for creating outstanding applications. We will discuss it further in next chapters.
* **ASP.NET Web API:** ASP.NET API is an API application model (Application Programming Interface). ASP.NET API is being merged into the new ASP.NET Core, ASP.NET Web Forms, ASP.NET Web Forms is an event driven application model, ASP.NET Web Forms is not a part of the new ASP.NET Core.
* **ASP.NET:** ASP.NET was released in 2002 as a successor to Classic ASP, ASP.NET pages have the extension .aspx and are normally written in C# (C sharp), ASP.NET 4.6 is the latest official version of ASP.NET, ASP.NET 5 was expected to be an important redesign of ASP.NET.
* **ASP.NET is a part of Microsoft .NET Framework. The following image shows the component stack.**

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**Q.11) Draw & explain ASP Page Lifecycle stages?**

* **ASP.NET Page Lifecycle:** In ASP.NET, a web page has execution lifecycle that includes various phases. These phases include initialization, instantiation, restoring and maintaining state etc. it is required to understand the page lifecycle so that we can put custom code at any stage to perform our business logic.Page Lifecycle stages: The following table contains the lifecycle stages of ASP.NET web page.

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| **Stage** | **Description** |
| **Page request** | This stage occurs before the lifecycle begins. When a page is requested by the user, ASP.NET parses and compiles that page. |
| **Start** | In this stage, page properties such as Request and response are set. It also determines the Request type. |
| **Initialization** | In this stage, each control's UniqueID property is set. Master page is applied to the page. |
| **Load** | During this phase, if page request is postback, control properties are loaded with information. |
| **Postback event handling** | In this stage, event handler is called if page request is postback. After that, the Validate method of all validator controls is called. |
| **Rendering** | Before rendering, view state is saved for the page and all controls. During the rendering stage, the page calls the Render method for each control, providing a text writer that writes its output to the OutputStream object of the page's Response property. |
| **Unload** | At this stage the requested page has been fully rendered and is ready to terminate.at this stage all properties are unloaded and cleanup is performed. |

**Q.12) What is C# & differences between Java and C#?**

* **C#** is pronounced as "C-Sharp". It is an object-oriented programming language provided by Microsoft that runs on .Net Framework. By the help of C# programming language, we can develop different types of secured and robust applications:

1. Mobile applications
2. Desktop applications
3. Web applications
4. Web services
5. Web sites
6. Games
7. VR
8. Database applications

* C# is approved as a standard by ISO. C# is designed for CLI (Common Language Infrastructure). CLI is a specification that describes executable code and runtime environment. C# programming language is influenced by C++, Java, Eiffel, Modula-3, Pascal etc. language

**Q.13) Write simple example of C# & explain?**

* **C# is object oriented programming language. It provides a lot of features.**

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| **Example:** |
| using System;    namespace HelloWorld  {  class Program  {  static void Main(string[] args)  {  Console.WriteLine("Hello World!");  }  }  } |

* **Description:**
* **class:**is a keyword which is used to define class.
* **Program**: is the class name. A class is a blueprint or template from which objects are created. It can have data members and methods. Here, it has only Main method.
* **static:**is a keyword which means object is not required to access static members. So it saves memory.
* **void:** is the return type of the method. It does't return any value. In such case, return statement is not required.
* **Main:**is the method name. It is the entry point for any C# program. Whenever we run the C# program, Main() method is invoked first before any other method. It represents start up of the program.
* **string[] args:**is used for command line arguments in C#. While running the C# program, we can pass values. These values are known as arguments which we can use in the program.
* **System.Console.WriteLine("Hello World!"):**Here, System is the namespace. Console is the class defined in System namespace. The WriteLine() is the static method of Console class which is used to write the text on the console.

**Q.14) Short note on C# Data types?**

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| **No.** | **Java** | **C#** |
| **1)** | Java is a high level, robust, secured and object-oriented programming language developed by Oracle. | C# is an object-oriented programming language developed by Microsoft that runs on .Net Framework. |
| **2)** | Java programming language is designed to be run on a Java platform, by the help of Java Runtime Environment (JRE). | C# programming language is designed to be run on the Common Language Runtime (CLR). |
| **3)** | Java type safety is safe. | C# type safety is unsafe. |
| **4)** | In java, built-in data types that are passed by value are called primitive types. | In C#, built-in data types that are passed by value are called simple types. |
| **5)** | Arrays in Java are direct specialization of Object. | Arrays in C# are specialization of System. |
| **6)** | Java does not support conditional compilation. | C# supports conditional compilation using preprocessor directives. |
| **7)** | Java doesn't support goto statement. | C# supports goto statement. |
| **8)** | Java doesn't support structures and unions. | C# supports structures and unions. |
| **9)** | Java supports checked exception and unchecked exception. | C# supports unchecked exception. |

**Q.15) What is Node.js & different parts of Node.js?**

* **Node.js:** Node.js is an open source server environment. Node.js allows you to run JavaScript on the server. Node.js is a cross-platform runtime environment and library for running JavaScript applications outside the browser. Node.js is designed to build scalable network applications. It is used for creating server-side and networking web applications. It is open source and free to use. Many of the basic modules of Node.js are written in JavaScript. Node.js is mostly used to run real-time server applications. Node.js uses asynchronous programming!

1. Node.js handles a file request:
2. Sends the task to the computer's file system.
3. Ready to handle the next request.

* When the file system has opened and read the file, the server returns the content to the client.

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1. Node.js eliminates the waiting, and simply continues with the next request.
2. Node.js runs single-threaded, non-blocking, asynchronous programming, which is very memory efficient.

**Q.16) Describe Features of Node.js?**

* **Features of Node.js:** Following is a list of some important features of Node.js that makes it the first choice of software architects.
* **Extremely fast:**Node.js is built on Google Chrome's V8 JavaScript Engine, so its library is very fast in code execution.
* **I/O is Asynchronous and Event Driven:**All APIs of Node.js library are asynchronous i.e. non-blocking. So a Node.js based server never waits for an API to return data. The server moves to the next API after calling it and a notification mechanism of Events of Node.js helps the server to get a response from the previous API call. It is also a reason that it is very fast.
* **Single threaded:**Node.js follows a single threaded model with event looping.
* **Highly Scalable:**Node.js is highly scalable because event mechanism helps the server to respond in a non-blocking way.
* **No buffering:**Node.js cuts down the overall processing time while uploading audio and video files. Node.js applications never buffer any data. These applications simply output the data in chunks.
* **Open source:**Node.js has an open source community which has produced many excellent modules to add additional capabilities to Node.js applications.
* **License:**Node.js is released under the MIT license.

**Q.17) Write Node.js OS basic operating-system function?**

* **Node.js OS provides few basic operating-system related utility functions. Let's see the list generally used functions or methods:**

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| **Index** | **Method** | **Description** |
| **1.** | **os.arch()** | This method is used to fetch the operating system CPU architecture. |
| **2.** | **os.cpus()** | This method is used to fetch an array of objects containing information about each cpu/core installed: model, speed (in MHz), and times (an object containing the number of milliseconds the cpu/core spent in: user, nice, sys, idle, and irq). |
| **3.** | **os.endianness()** | This method returns the endianness of the cpu. Its possible values are 'BE' for big endian or 'LE' for little endian. |
| **4.** | **os.freemem()** | This methods returns the amount of free system memory in bytes. |
| **5.** | **os.homedir()** | This method returns the home directory of the current user. |
| **6.** | **os.hostname()** | This method is used to returns the hostname of the operating system. |
| **7.** | **os.loadavg()** | This method returns an array containing the 1, 5, and 15 minute load averages. The load average is a time fraction taken by system activity, calculated by the operating system and expressed as a fractional number. |

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