PHP Programming Basics

THE ZEND EXAM IS designed so that you need a reasonable amount of experience in order to pass it. This doesn't mean that you have to be Superman—it simply means that, in order to pass the exam, you've had to have a good amount of exposure to PHP in your daily life.

Therefore, it is essential that you know your "basics" very well. These are the elements of PHP that you will deal with on a constant basis, since they are at the very foundation of the language itself. While not being very prepared on other areas of the exam may only be the result of them not being part of your day-to-day programming routine, failing a considerable number of questions in this chapter should raise a red flag. After all, if you don't know the basics, you'll have trouble understanding more advanced topics as well.

PHP Programming Basics

Questions

1. Choose the selection that best matches the following statements:
   PHP is a _____ scripting language based on the ____ engine. It is primarily used to develop dynamic _____ content, although it can be used to generate ____ documents (among others) as well.
   A. Dynamic, PHP, Database, HTML
   B. Embedded, Zend, HTML, XML
   C. Perl-based, PHP, Web, Static
   D. Embedded, Zend, Docbook, MySQL
   E. Zend-based, PHP, Image, HTML
2. Which of the following tags is not a valid way to begin and end a PHP code block?
   A. <% %>
   B. <? ?>
   C. <?= ?>
   D. <! !>
   E. <?php ?>
3. Which of the following is not valid PHP code?
   A. $_10
   B. ${"MyVar"}
   C. &$something
   D. $10_somethings
   E. $aVaR
4. What is displayed when the following script is executed?

```
<?php
   define(myvalue, "10");
   $myarray[10] = "Dog";
   $myarray[] = "Human";
   $myarray['myvalue'] = "Cat";
   $myarray["Dog"] = "Cat";
   print "The value is: ";
   print $myarray[myvalue]."\n";
?>
```

   A. The value is: Dog
   B. The value is: Cat
   C. The value is: Human
   D. The value is: 10
   E. Dog
5. What is the difference between print() and echo()?
   A. print() can be used as part of an expression, while echo() can't

B. echo() can be used as part of an expression, while print() can't
C. echo() can be used in the CLI version of PHP, while print() can't
D. print() can be used in the CLI version of PHP, while echo() can't
E. There's no difference: both functions print out some text!

6. What is the output of the following script?

```
<?php
    $a = 10;
    $b = 20;
    $c = 4;
    $d = 8;
    $e = 1.0;
    $f = $c + $d * 2;
    $g = $f % 20;
    $h = $b - $a + $c + 2;
    $i = $h << $c;
    $j = $i * $e;
    print $j;
?>
```

A. 128
B. 42
C. 242.0
D. 256
E. 342

7. Which values should be assigned to the variables $a, $b and $c in order for the following script to display the string Hello, World!?

```
<?php
    $string = "Hello, World!";
    $a = ?;
    $b = ?;
    $c = ?;
    if($a) {
        if($b && !$c) {
            echo "Goodbye Cruel World!";
        } else if(!$b && !$c) {
            echo "Nothing here";
        }
    } else {
        if(!$b) {
            if(!$a && (!$b && $c)) {
                echo "Hello, World!";
            } else {
                echo "Goodbye World!";
            }
        } else {
            echo "Not quite.";
        }
    }
?>
```

A. False, True, False
B. True, True, False
C. False, True, True

D. False, False, True
E. True, True, True

8. What will the following script output?

```
<?php
$array = '0123456789ABCDEFG';
$s = '';
for ($i = 1; $i < 50; $i++) {
        $s .= $array[rand(0,strlen ($array) - 1)];
}
echo $s;
?>
```

A. A string of 50 random characters
B. A string of 49 copies of the same character, because the random number generator has not been initialized
C. A string of 49 random characters
D. Nothing, because $array is not an array
E. A string of 49 'G' characters

9. Which language construct can best represent the following series of if conditionals?

```
<?php
        if($a == 'a') {
                somefunction();
        } else if ($a == 'b') {
                anotherfunction();
        } else if ($a == 'c') {
                dosomething();
        } else {
                donothing();
        }
?>
```

A. A switch statement without a default case
B. A recursive function call
C. A while statement
D. It is the only representation of this logic
E. A switch statement using a default case

10. What is the best way to iterate through the $myarray array, assuming you want to modify the value of each element as you do?

```
<?php
  $myarray = array ("My String",
                    "Another String",
                    "Hi, Mom!");
?>
```

A. Using a for loop
B. Using a foreach loop
C. Using a while loop
D. Using a do...while loop
E. There is no way to accomplish this goal

11. Consider the following segment of code:

```
<?php
```

```
define("STOP_AT", 1024);
$result = array();
/* Missing code */
{
    $result[] = $idx;
}
print_r($result);
?>
```

What should go in the marked segment to produce the following array output?

```
Array
{
  [0] => 1
  [1] => 2
  [2] => 4
  [3] => 8
  [4] => 16
  [5] => 32
  [6] => 64
  [7] => 128
  [8] => 256
  [9] => 512
}
```

A. foreach($result as $key => $val)
B. while($idx *= 2)
C. for($idx = 1; $idx < STOP_AT; $idx *= 2)
D. for($idx *= 2; STOP_AT >= $idx; $idx = 0)
E. while($idx < STOP_AT) do $idx *= 2

12. Choose the appropriate function declaration for the user-defined function is_leap(). Assume that, if not otherwise defined, the is_leap function uses the year 2000 as a default value:

```
<?php
/* Function declaration here */
{
  $is_leap = (!($year %4) && (($year % 100) ||
        !($year % 400)));
    return $is_leap;
}
var_dump(is_leap(1987));      /* Displays false */
var_dump(is_leap());          /* Displays true */
?>
```

A. function is_leap($year = 2000)
B. is_leap($year default 2000)
C. function is_leap($year default 2000)
D. function is_leap($year)
E. function is_leap(2000 = $year)

13. What is the value displayed when the following is executed? Assume that the code was executed using the following URL:

testscript.php?c=25

```
<?php
```

```
        function process($c, $d = 25)
        {
            global $e;
            $retval = $c + $d - $_GET['c'] - $e;
            return $retval;
        }
        $e = 10;
        echo process(5);
    ?>
```

A. 25
B. -5
C. 10
D. 5
E. 0

14. Consider the following script:

```
    <?php
        function myfunction($a, $b = true)
        {
            if($a && !$b) {
                echo "Hello, World!\n";
            }
        }
        $s = array(0 => "my",
                   1 => "call",
                   2 => '$function',
                   3 => ' ',
                   4 => "function",
                   5 => '$a',
                   6 => '$b',
                   7 => 'a',
                   8 => 'b',
                   9 => ");
        $a = true;
        $b = false;
        /* Group A */
        $name = $s[?].$s[?].$s[?].$s[?].$s[?].$s[?];
        /* Group B */
        $name(${$s[?]}, ${$s[?]});
    ?>
```

Each ? in the above script represents an integer index against the $s array. In order to display the Hello, World! string when executed, what must the missing integer indexes be?

A. Group A: 4,3,0,4,9,9 Group B: 7,8
B. Group A: 1,3,0,4,9,9 Group B: 7,6
C. Group A: 1,3,2,3,0,4 Group B: 5,8
D. Group A: 0,4,9,9,9,9 Group B: 7,8
E. Group A: 4,3,0,4,9,9 Group B: 7,8

15. Run-time inclusion of a PHP script is performed using the _____ construct, while compile-time inclusion of PHP scripts is performed using the _____ construct.

A. include_once, include
B. require, include

C. require_once, include
D. include, require
E. All of the above are correct

16. Under what circumstance is it impossible to assign a default value to a parameter while declaring a function?
A. When the parameter is Boolean
B. When the function is being declared as a member of a class
C. When the parameter is being declared as passed by reference
D. When the function contains only one parameter
E. Never
17. The ____ operator returns True if either of its operands can be evaluated as True, but not both.
Your Answer: _____
18. How does the identity operator === compare two values?
A. It converts them to a common compatible data type and then compares the resulting values
B. It returns True only if they are both of the same type and value
C. If the two values are strings, it performs a lexical comparison
D. It bases its comparison on the C strcmp function exclusively
E. It converts both values to strings and compares them
19. Which of the following expressions multiply the value of the integer variable $a by 4? (Choose 2)
A. $a *= pow (2, 2);
B. $a >>= 2;
C. $a <<= 2;
D. $a += $a + $a;
E. None of the above
20. How can a script come to a clean termination?
A. When exit() is called
B. When the execution reaches the end of the current file
C. When PHP crashes
D. When Apache terminates because of a system problem

Object-oriented Programming with PHP 4

WHILE PHP 4 IS not the poster child of a successful OOP implementation, it can nonetheless be
used to build a viable object-oriented infrastructure—you just need to know where the pitfalls of an imperfect object model lie and work around them carefully.

Even though PHP 5 has brought many changes to the way PHP handles objects and you may be tempted to simply ignore PHP 4's capabilities, the truth is that OOP was embraced by many programmers who started developing their applications with the "old" PHP. This has resulted in a lot of OOP code out there—and the likelihood that you'll find yourself working with it even before you make the jump to PHP 5 is very high.

The OOP portion of the exam tests your knowledge not only of object-oriented programming in general, but also of the unique way PHP 4 implements it.

Object-oriented Programming With PHP 4

Questions

1. What is the construct used to define the blueprint of an object called?

   Your Answer: _____

2. At the end of the execution of the following script, which values will be stored in the $a->my_value array? (Choose 3)

```
<?php
class my_class
{
    var $my_value = array();
    function my_class ($value)
    {
        $this->my_value[] = $value;
    }
    function set_value ($value)
    {
        $this->$my_value = $value;
    }
}
$a = new my_class ('a');
$a->my_value[] = 'b';
$a->set_value ('c');
$a->my_class('d');
?>
```

   A. c
   B. b
   C. a
   D. d
   E. e

3. How can you write a class so that some of its properties cannot be accessed from outside its methods?
   A. By declaring the class as private
   B. By declaring the methods as private
   C. It cannot be done
   D. By writing a property overloading method

4. Which object-oriented pattern would you use to implement a class that must be instantiated only once for the entire lifespan of a script?
   A. Model-view-controller

B. Abstract factory
C. Singleton
D. Proxy
E. State

5. A class can be built as an extension of other classes using a process known as inheritance. In PHP, how many parents can a child class inherit from?
   A. One
   B. Two
   C. Depends on system resources
   D. Three
   E. As many as needed
6. What OOP construct unavailable in PHP 4 does the following script approximate?

```
<?php
class my_class
{
      function my_funct ($my_param)
      {
            user_error ("Please define me", E_ERROR);
      }
```



```
      function b()
      {
            return 10;
      }
}
?>
```

   A. Multiple inheritance
   B. Interfaces
   C. Abstract methods
   D. Private methods
   E. Function overloading
7. Assume that a class called testclass is defined. What must the name of its constructor method be?
   A. __construct
   B. initialize
   C. testclass
   D. __testclass
   E. Only PHP 5 supports constructors
8. How can a class override the default serialization mechanism for its objects?
   A. By implementing the __shutdown and __startup methods
   B. By calling register_shutdown_function()
   C. By implementing __sleep() and __wakeup()
   D. The default serialization mechanism cannot be overridden
   E. By adding the class to the output buffering mechanism using ob_start()
9. In PHP 4, which object-oriented constructs from the following list are not available?
   - Abstract classes
   - Final classes
   - Public, private, protected (PPP) methods
   - Interfaces

A. Abstract classes
B. PPP methods
C. Neither PPP methods nor interfaces
D. None of the above are available
E. All of the above are available

10. How would you call the mymethod method of a class within the class itself?
A. $self=>mymethod();
B. $this->mymethod();
C. $current->mymethod();
D. $this::mymethod();
E. None of the above are correct

11. What will the following script output?

```
<?php
class my_class
{
        var             $my_var;
        function _my_class ($value)
        {
                $this->my_var = $value;
        }
}
$a = new my_class (10);
echo $a->my_var;
?>
```

A. 10
B. Null
C. Empty
D. Nothing
E. An error

12. What will the following script output?

```
<?php
class my_class
{
        var $value;
}
$a = new my_class;
$a->my_value = 5;
$b = $a;
$b->my_value = 10;
echo $a->my_value;
?>
```

A. 10
B. 5
C. 2
D. Null
E. Nothing

13. Consider the following script. What will it output?

```
<?php
$global_obj = null;
class my_class
{
        var $value;
```

```
        function my_class()
        {
            global $global_obj;
            $global_obj = &$this;
        }
    }
    $a = new my_class;
    $a->my_value = 5;

    $global_obj->my_value = 10;
    echo $a->my_value;
    ?>
```

A. 5
B. 10
C. Nothing
D. The constructor will throw an error
E. 510

14. Consider the following segment of PHP code. When it is executed, the string returned by the $eight_tenths->to_string method is 8 / 10 instead of the expected 4 / 5. Why?

```
<?php
    class fraction {
        var $numerator;
        var $denominator;
        function fraction($n, $d) {
            $this->set_numerator($n);
            $this->set_denominator($d);
        }
        function set_numerator($num) {
            $this->numerator = (int)$num;
        }
        function set_denominator($num) {
            $this->denominator = (int)$num;
        }
        function to_string() {
            return "{$this->numerator}
                / {$this->denominator}";
        }
    }
    function gcd($a, $b) {
        return ($b > 0) ? gcd($b, $a % $b) : $a;
    }
    function reduce_fraction($fraction) {
        $gcd = gcd($fraction->numerator,
            $fraction->denominator);

        $fraction->numerator /= $gcd;
        $fraction->denominator /= $gcd;
    }
    $eight_tenths = new fraction(8,10);
    /* Reduce the fraction */
    reduce_fraction($eight_tenths);
    var_dump($eight_tenths->to_string());
```

```
?>
```

A. The reduce_fraction function must return a value
B. The reduce_fraction function should accept integer values
C. The gcd function is flawed
D. You must pass the $eight_tenths object by-reference
E. You cannot pass instances of objects to anything but methods

15. What does the following PHP code segment do?

```
<?php
    require_once("myclass.php");
    myclass::mymethod();
?>
```

A. Calls the mymethod method in the class statically.
B. Creates and instance of myclass and calls the mymethod method.
C. Generates a syntax error
D. Defaults to the last-created instance of myclass and calls mymethod()
E. Calls the function named myclass::mymethod()

16. Do static class variables exist in PHP?

A. Yes
B. No

17. What will the following script output?

```
<?php
class a
{
    function a ($x = 1)
    {
        $this->myvar = $x;
    }
}
class b extends a
{
    var $myvar;
    function b ($x = 2)
    {
        $this->myvar = $x;
        parent::a();
    }
}
$obj = new b;
echo $obj->myvar;
?>
```

A. 1
B. 2
C. An error, because a::$myvar is not defined
D. A warning, because a::$myvar is not defined
E. Nothing

18. How can you load classes on demand as they are required by the interpreter?

A. By using the __autoload magic function
B. By defining them as forward classes
C. By implementing a special error handler
D. It is not possible to load classes on demand
E. By including them in conditional include statements

19. _____ are used to provide high-quality solutions to a recurrent design problem using object-oriented programming.

Your Answer: _____

20. What will the following script output?

```
<?php
class a
{
	function a()
	{
		echo 'Parent called';
	}
}
class b
{
	function b()
	{
	}
}
$c = new b();
?>
```

A. Parent called
B. An error
C. A warning
D. Nothing

PHP as a Web Development Language

WITHOUT THE WORLD WIDE Web, the life of a PHP developer would be very grim indeed—in fact, one might wonder whether PHP would exist at all were it not for the fact that the Web's incredible popularity has opened the doors to a need for faster and simpler application development.

When working with websites, it's important to have an intimate knowledge of the fundamentals of web browser programming with HTML and HTTP transaction manipulation through headers and cookies. In addition, this section of the exam also covers the persistence of data across multiple requests through sessions.

Once you've learned to use the language, this is likely to be the area of PHP development that you will get to know most intimately first. Therefore, it's important that you be very familiar with these concepts to ensure that you will successfully pass the exam.

PHP as a Web Development Language

Questions

1. How are session variables accessed?
   A. Through $_GET
   B. Through $_POST
   C. Through $_REQUEST
   D. Through global variables
   E. None of the above
2. What function causes the following header to be added to your server's output?

```
Set-Cookie: foo=bar;
```

   Your Answer: _____
3. Under normal circumstances—and ignoring any browser bugs—how can a cookie be accessed from a domain other than the one it was set for?
   A. By consulting the HTTP_REMOTE_COOKIE header
   B. It cannot be done
   C. By setting a different domain when calling setcookie()
   D. By sending an additional request to the browser
   E. By using Javascript to send the cookie as part of the URL
4. How can the index.php script access the email form element of the following HTML form? (Choose 2)

```
<form action="index.php" method="post">
    <input type="text" name="email"/>
</form>
```

   A. $_GET['email']
   B. $_POST['email']
   C. $_SESSION['text']
   D. $_REQUEST['email']
   E. $_POST['text']

5. What will be the net effect of running the following script on the $s string? (Choose 2)

```
<?php
$s = '<p>Hello</p>';
$ss = htmlentities ($s);
echo $s;
?>
```

   A. The string will become longer because the angular brackets will be converted to their HTML meta character equivalents
   B. The string will remain unchanged
   C. If the string is printed to a browser, the angular brackets will be visible

D. If the string is printed to a browser, the angular brackets will not be visible and it will be interpreted as HTML
E. The string is destroyed by the call to htmlentities()

6. If no expiration time is explicitly set for a cookie, what happens to it?
A. It expires right away
B. It never expires
C. It is not set
D. It expires at the end of the user's browser session
E. It expires only if the script doesn't create a server-side session

7. Consider the following form and subsequent script. What will the script print out if the user types the word "php" and "great" in the two text boxes respectively?

```
<form action="index.php" method="post">
<input type="text" name="element[]">
<input type="text" name="element[]">
</form>

<?php
echo $_GET['element'];
?>
```

A. Nothing
B. Array
C. A notice
D. phpgreat
E. greatphp

8. In an HTTPS transaction, how are URLs and query strings passed from the browser to the web server?
A. They are passed in clear text, and the subsequent transaction is encrypted
B. They are encrypted
C. The URL is left in clear text, while the query string is encrypted
D. The URL is encrypted, while the query string is passed in clear text
E. To ensure its encryption, the query string is converted into a header and passed along with the POST information

9. What happens when a form submitted to a PHP script contains two elements with the same name?
A. They are combined in an array and stored in the appropriate superglobal array
B. The value of the second element is added to the value of the first in the appropriate superglobal array
C. The value of the second element overwrites the value of the first in the appropriate superglobal array
D. The second element is automatically renamed
E. PHP outputs a warning

10. How would you store an array in a cookie?
A. By adding two square brackets ([]) to the name of the cookie
B. By using the implode function
C. It is not possible to store an array in a cookie due to storage limitations
D. By using the serialize function
E. By adding the keyword ARRAY to the name of the cookie

11. What will the following script output?

```
<?php
ob_start();
for ($i = 0; $i < 10; $i++) {
```

```
        echo $i;
    }
    $output = ob_get_contents();
    ob_end_clean();
    echo $ouput;
    ?>
```

A. 12345678910
B. 1234567890
C. 0123456789
D. Nothing
E. A notice

12. By default, PHP stores session data in _____.
    A. The filesystem
    B. A database
    C. Virtual memory
    D. Shared memory
    E. None of the above
13. When you write a cookie with an expiration date in the future to a particular machine, the cookie never seem to be set. The technique usually works with other computers, and you have checked that the time on the machine corresponds to the time on the server within a reasonable margin by verifying the date reported by the operating system on the client computer's desktop. The browser on the client machine seems to otherwise work fine on most other websites. What could be likely causes of this problem? (Choose 2)
    A. The browser's binaries are corrupt
    B. The client machine's time zone is not set properly
    C. The user has a virus-scanning program that is blocking all secure cookies
    D. The browser is set to refuse all cookies
    E. The cookie uses characters that are discarded all data from your server

14. Assuming that the client browser is never restarted, how long after the last access will a session "expire" and be subject to garbage collection?
    A. After exactly 1,440 seconds
    B. After the number of seconds specified in the session.gc_maxlifetime INI setting
    C. It will never expire unless it is manually deleted
    D. It will only expire when the browser is restarted
    E. None of the above
15. The _____ function automatically transforms newline characters into HTML
 tags
    Your Answer: _____

Working with Arrays

ARRAYS ARE, PERHAPS, THE most powerful aspect of PHP. The degree of freedom that the language allows a developer when creating and manipulating arrays is nothing short of spectacular: not only can you mix-and-match different types of keys and values, but you can perform all sorts of operations on them, from sorting to splitting to combining.

With great powers, however, come great responsibilities. The flip side of such a vast array of possibilities (no pun intended) is that knowing the best way to manipulate arrays is not always an easy task. This portion of the exam focuses on your ability to understand how arrays work, not only from a theoretical viewpoint, but also from a practical one. Therefore, expect a lot of questions in which you'll find yourself facing a brief script, asked to understand what's wrong with it or what its final result will be.

Working with Arrays

Questions

1. Array values are keyed by _____ values (called indexed arrays) or using _____ values (called associative arrays). Of course, these key methods can be combined as well.
   A. Float, string
   B. Positive number, negative number
   C. Even number, string
   D. String, Boolean
   E. Integer, string

2. Consider the following array, called $multi_array. How would the value cat be referenced within the $multi_array array?

```
<?php
  $multi_array = array("red",
                       "green",
                       42 => "blue",
                       "yellow" => array("apple",
                       9 => "pear",
                       "banana",
                       "orange" => array("dog",
                                         "cat",
                                         "iguana")
                                   )
                      );
?>
```

   A. $multi_array['yellow']['apple'][0]
   B. $multi_array['blue'][0]['orange'][1]
   C. $multi_array[3][3][2]
   D. $multi_array['yellow']['orange']['cat']
   E. $multi_array['yellow']['orange'][1]

3. What will the $array array contain at the end of the execution of the following script?

```
<?php
$array = array ('1', '1');
foreach ($array as $k => $v) {
        $v = 2;
}
?>
```

   A. array ('2', '2')
   B. array ('1', '1')
   C. array (2, 2)

D. array (Null, Null)
E. array (1, 1)

4. Assume you would like to sort an array in ascending order by value while preserving key associations. Which of the following PHP sorting functions would you use?
A. ksort()
B. asort()
C. krsort()
D. sort()
E. usort()

5. What is the name of a function used to convert an array into a string?
Your Answer: _____

6. In what order will the following script output the contents of the $array array?

```
<?php
$array = array ('a1', 'a3', 'a5', 'a10', 'a20');
natsort ($array);
var_dump ($array);
?>
```

A. a1, a3, a5, a10, a20
B. a1, a20, a3, a5, a10
C. a10, a1, a20, a3, a5
D. a1, a10, a5, a20, a3
E. a1, a10, a20, a3, a5

7. Which function would you use to rearrange the contents of the following array so that they are reversed (i.e.: array ('d', 'c', 'b', 'a') as the final result)? (Choose 2)

```
<?php
$array = array ('a', 'b', 'c', 'd');
?>
```

A. array_flip()
B. array_reverse()
C. sort()
D. rsort()
E. None of the above

8. What will the following script output?

```
<?php
$array = array ('3' => 'a', '1b' => 'b', 'c', 'd');
echo ($array[1]);
?>
```

A. 1
B. b
C. c
D. A warning.
E. a

9. What is the simplest method of computing the sum of all the elements of an array?
A. By traversing the array with a for loop
B. By traversing the array with a foreach loop
C. By using the array_intersect function
D. By using the array_sum function
E. By using array_count_values()

10. What will the following script output?

```
<?php
```

```
$array = array (0.1 => 'a', 0.2 => 'b');
echo count ($array);
?>
```

A. 1
B. 2
C. 0
D. Nothing
E. 0.3

11. What elements will the following script output?

```
<?php
$array = array (true => 'a', 1 => 'b');
var_dump ($aray);
?>
```

A. 1 => 'b'
B. True => 'a', 1 => 'b'
C. 0 => 'a', 1 => 'b'
D. None
E. It will output NULL

12. Absent any actual need for choosing one method over the other, does passing arrays by value to a read-only function reduce performance compared to passing them by reference?

A. Yes, because the interpreter must always create a copy of the array before passing it to the function.
B. Yes, but only if the function modifies the contents of the array.
C. Yes, but only if the array is large.
D. Yes, because PHP must monitor the execution of the function to determine if changes are made to the array.
E. No.

13. What will the following script output?

```
<?php
function sort_my_array ($array)
{
    return sort ($array);
}
$a1 = array (3, 2, 1);
var_dump (sort_my_array (&$a1));
?>
```

A. NULL
B. 0 => 1, 1 => 2, 2 => 3
C. An invalid reference error
D. 2 => 1, 1 => 2, 0 => 3
E. bool(true)

14. What will be the output of the following script?

```
<?php
$result = '';
function glue ($val)
{
    global $result;
    $result .= $val;
}
$array = array ('a', 'b', 'c', 'd');
array_walk ($array, 'glue');
```

```
echo $result;
?>
```

Your Answer: _____

15. What will the following script output?

```
<?php
$array = array (1, 2, 3, 5, 8, 13, 21, 34, 55);
$sum = 0;
for ($i = 0; $i < 5; $i++) {
    $sum += $array[$array[$i]];
}
echo $sum;
?>
```

A. 78
B. 19
C. NULL
D. 5
E. 0

Strings and Regular Expressions

STRINGS ARE THE SWISS-ARMY knife of PHP, particularly if you consider the fact that most PHP scripts are used to serve web pages—which are, for the most part, nothing more than large strings. Knowing how to use this particular facility is, therefore, one of the most fundamental skills of the PHP developer, since you'll be working with them day in and day out.

Luckily, its essential role in the life of a PHP script has resulted in string manipulation being made exceptionally easy by the PHP development team. Therefore, once you get past the first few hurdles, handling strings becomes easy, quick and—to some extent—even fun.

However, this particular aspect of PHP programming is far from being free of pitfalls. This portion of the exam tests your understanding of strings as well as your knowledge of the body of functions that are used to manipulate them. Additionally, you'll find yourself faced with the basics of that most voodoo art of writing regular expressions, which, despite being a hugely useful tool, is too often neglected by most developers.

Questions

1. Consider the following script. What line of code should be inserted in the marked location in order to display the string php when this script is executed?

```
<?php
    $alpha = 'abcdefghijklmnopqrstuvwxyz';
    $letters = array(15, 7, 15);
    foreach($letters as $val) {
        /* What should be here */
    }
?>
```

   A. echo chr($val);
   B. echo asc($val);
   C. echo substr($alpha, $val, 2);
   D. echo $alpha{$val};
   E. echo $alpha{$val+1}

2. Which of the following will not combine strings $s1 and $s2 into a single string?
   A. $s1 + $s2
   B. "{$s1}{$s2}"
   C. $s1.$s2
   D. implode('', array($s1,$s2))
   E. All of the above combine the strings

3. Given a variable $email containing the string user@example.com, which of the following statements would extract the string example.com?
   A. substr($email, strpos($email, "@"));
   B. strstr($email, "@");
   C. strchr($email, "@");
   D. substr($email, strpos($email, "@")+1);
   E. strrpos($email, "@");

4. Given a comma-separated list of values in a string, which function from the given list can create an array of each individual value with a single call?
   A. strstr()
   B. Cannot be done with a single function
   C. extract()
   D. explode()
   E. strtok()

5. What is the best all-purpose way of comparing two strings?

Using the strpos function

A.

B. Using the == operator

C. Using strcasecmp()

D. Using strcmp()

6. Which of the following PCRE regular expressions best matches the string php|architect?

A. .*

B. ...|.....

C. \d{3}\|\d{8}

D. [az]{3}\|[az]{9}

E. [a-z][a-z][a-z]\|\w{9}

7. Which of the following functions can be used to determine the integrity of a string? (Choose 3)

A. md5()

B. sha1()

C. str_rot13()

D. crypt()

E. crc32()

8. Which PHP function does the following script simulate on a UNIX machine?

```
<?php
function my_funct ($filename)
{
        $f = file_get_contents ($filename);
        return explode ("\n", $f);
}
?>
```

A. fopen()

B. fread()

C. flock()

D. split_string()

E. file()

9. Which of the following functions can be used to break a string into an array based on a specific pattern? (Choose 2)

A. preg_split()

B. ereg()

C. str_split()

D. explode()

E. chop()

10. What will the following script output?

```
<?php
echo 'Testing ' . 1 + 2 . '45';
?>
```

A. Testing 1245

B. Testing 345

C. Testing 1+245

D. 245

E. Nothing

11. What will be the output of the following script?

```
<?php
$s = '12345';
```

```
$s[$s[1]] = '2';
echo $s;
?>
```

A. 12345
B. 12245
C. 22345
D. 11345
E. Array

12. Which of the strings below will be matched by the following PCRE regular expression? (Choose 2)

```
/.*\*123\d/
```

A. ******123
B. *****_1234
C. ******1234
D. _*1234
E. _*123

13. Which of the following comparisons will return True? (Choose 2)
A. '1top' == '1'
B. 'top' == 0
C. 'top' === 0
D. 'a' == a
E. 123 == '123'

14. What happens if you add a string to an integer using the + operator?
A. The interpreter outputs a type mismatch error
B. The string is converted to a number and added to the integer
C. The string is discarded and the integer is preserved
D. The integer and string are concatenated together in a new string
E. The integer is discarded and the string is preserved

15. Consider the following script. Assuming that http://www.php.net can be successfully read, what will it output?

```
<?php
$s = file_get_contents ("http://www.php.net");
strip_tags ($s, array ('p'));
echo count ($s);
?>
```

A. The length of the www.php.net homepage
B. The length of the www.php.net homepage stripped of all its <p> tags
C. 1
D. 0
E. The length of the www.php.net homepage stripped of all its tags except for <p> tags

16. The _____ function can be used to compare two strings using a case-insensitive binary algorithm
A. strcmp()
B. stricmp()
C. strcasecmp()
D. stristr()
E. None of the above

17. Which of the following functions can be used to convert the binary data stored in a string into its hexadecimal representation? (Choose 2)
A. encode_hex()

B. pack()
C. hex2bin()
D. bin2hex()
E. printf()

18. The _____ function can be used to ensure that a string always reaches a specific minimum length.

Your Answer: _____

19. What will the following script output?

```
<?php
$a = 'able osts indy';
echo wordwrap ($a, 1, "c", false);
?>
```

Your Answer: _____

20. What will the following script output?

```
<?php
$x = 'apple';
echo substr_replace ($x, 'x', 1, 2);
?>
```

A. x
B. axle
C. axxle
D. applex
E. xapple

Manipulating Files and the Filesystem

THOUGH YOU MAY NEVER think of file manipulation as one PHP's strengths, it is actually a very useful tool for the developer. Even if you only develop websites, being able to read from and write to a file can turn out to be a very handy capability. After all, remember that, thanks to its stream wrappers (covered in more detail in Chapter 10), PHP makes it possible to open a remote file and read from it—useful, for example, for including content from a third-party site.

On a more basic level, however, file input/output can be used for a multitude of tasks. For example, it's handy for reading and interpreting the contents of a preformatted file, such as you could receive from a third-party provider sending you syndicated content, or for opening up and outputting binary files to the browser through your scripts so that you can more tightly control access to them. Whatever the end use, you will be tested not only on the basics of opening, closing and accessing a file's contents, but also on fundamental aspects of file manipulation that are relevant in a multi-process environment, such as file locking.

Manipulating Files and the Filesystem

Questions

1. The _____ function is used to read a single line from a file and is used when dealing with text files. For reading binary data or other specific segments of a file, you should use the _____ function instead.
   A. fgets(), fseek()
   B. fread(), fgets()
   C. fputs(), fgets()
   D. fgets(), fread()
   E. fread(), fseek()
2. Although file resources will automatically be closed at the end of a request in PHP, you can close them explicitly by calling the _____ function.
   Your Answer: _____
3. Consider the following PHP script, which reads a file, line-by-line, from a text file. Which function call should be inserted in place of the question marks in order for the script to function correctly?

```
<?php
    $file = fopen("test", "r");
    while(!feof($file)) {
        echo ????????????;
    }
    fclose($file);
?>
```

   A. file_get_contents($file)
   B. file($file)
   C. read_file($file)
   D. fgets($file)
   E. fread($file)

4. Which of the following techniques will guarantee a lock safe from any race condition?
   A. Using flock() to lock the desired file
   B. fopen()'ing a file in the operating system's temporary directory
   C. Creating a temporary file with tempnam()
   Using mkdir() to create a directory and use it as a lock reference
   D.
   E. Using tmpfile() to create a temporary file
5. Which of the following functions retrieve the entire contents of a file in such a way that it can be used as part of an expression? (Choose 2)

A. file_get_contents()
B. fgets()
C. fopen()
D. file()
E. readfile()

6. How would you parse the contents of a multi-line text file formatted using a fixed pattern without preloading its contents into a variable and then processing them in memory?
A. Using file() to break it up into an array
B. Using sscanf()
C. Using fscanf()
D. Using fgets()
E. Using fnmatch()

7. Consider the following script. What will the file myfile.txt contain at the end of its execution?

```
<?php
$array = '0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ';
$f = fopen ("myfile.txt", "r");
for ($i = 0; $i < 50; $i++) {
        fwrite ($f, $array[rand(0, strlen ($array) - 1)]);
}
?>
```

A. Nothing, because $array is not an actual array but a string.
B. A random sequence of 49 characters.
C. A random sequence of 50 characters.
D. A random sequence of 41 characters.
E. Nothing, or the file will not exist, and the script will output an error

8. What does the built-in delete function do?
A. It deletes a file
B. It deletes a directory
C. It unsets a variable
D. It removes a database row
E. This function does not exist!

9. Consider the following script. Which PHP function best approximates its behaviour?

```
<?php
function my_funct ($file_name, $data)
{
        $f = fopen ($file_name, 'w');
        fwrite ($f, $data);
        fclose ($f);
}
?>
```

A. file_get_contents()
B. file_put_contents()
C. There is no equivalent function in PHP
D. file()
E. fputs()

10. What should you do if your script is having problem recognizing file endings from a text file saved on a platform different from the one you're reading it on?
A. Change the auto_detect_line_endings INI setting
B. Use a regular expression to detect the last letter of a line
C. Use fpos()

D. Use ftok()
E. Read the file one character at a time

11. Which parameters would you pass to fopen() in order to open a file for reading and writing (Choose 2)?
    A. w
    B. r
    C. a
    D. +
12. The function used to open a general-purpose file reference for reading and writing binary data in PHP is _____. The resource returned by it is used with functions such as fgets().
    Your Answer: _____
13. Which of the following functions reads the entire contents of a file? (Choose 3)
    A. fgets()
    B. file_get_contents()
    C. fread()
    D. readfile()
    E. file()
14. Which function is specifically designed to write a string to a text file?
    Your Answer: _____
15. Consider the following script. When you run it, you obtain the output 1, 1, even though the file test.txt has been deleted by your call to unlink() as expected. Which function would you add before the last call to file_exists() to ensure that this problem will not repeat itself?

```
<?php
$f = fopen ("test.txt", "w");
fwrite ($f, "test");
fclose ($f);
echo (int) file_exists("test.txt") . ', ';
unlink ("c:\\test.txt");
echo (int) file_exists ("test.txt");
?>
```

    A. clearstatcache()
    B. fflush()
    C. ob_flush()
    D. touch()
    E. None of the above
16. The _____ function determines whether a file can be written to.
    Your Answer: _____
17. Which of the following function calls will cause a file pointer to be returned to the beginning of the file?
    A. reset()
    B. fseek(-1)
    C. fseek(0, SEEK_END)
    D. fseek(0, SEEK_SET)
    E. fseek(0, SEEK_CUR)
18. What is the difference between stat() and fstat()?
    A. While stat() works on open file pointers, fstat() works on files specified by pathname
    B. While fstat() works on open file pointers, stat() works on files specified by pathname
    C. fstat() has nothing to do with files

D. stat() has nothing to do with files
E. fstat() is an alias of stat()

19. Which of the answers below best describes what the following script does?

```
<?php
echo number_format (disk_free_space ('c:\\') /
     disk_total_space('c:\\') * 100, 2) . '%';
?>
```

A. It calculates the amount of free space on the C: hard drive of a Windows machine
B. It prints out the percentage of free space remaining on the C: drive with a precision of two decimals
C. It prints out the total number of bytes remaining in the C: drive
D. It calculates the ratio between total space and free space on the C: drive
E. None of the above

20. Assuming that image.jpg exists and is readable by PHP, how will the following script be displayed if called directly from a browser?

```
<?php
      header ("Content-type: image/jpeg");
?>
<?php
      readfile ("image.jpg");
?>
```

A. As a JPEG image
B. As a binary file for display within the browser
C. As a binary file for download
D. As a JPEG file for download
E. As a broken image

Date and Time Management

ALMOST EVERY WEBSITE WILL, at some point, have to deal with dates and times. If you need to collect your users' birthdates, or if you need to record the time at which a particular transaction took place, PHP's date functions can help you in your tasks.

However, PHP's date/time management functions are anything but perfect. The fact that they are based entirely on the UNIX timestamp format makes them vulnerable to a number of different pitfalls of which you, as a developer, must be acutely aware in order to avoid finding yourself in the possession of very bad data.

At the same time, managing dates on the Web has become an international affair. As a result, you should be able to not only deal with different time zones, but also with different locales and their peculiar way of display date information.

This section of the exam tests your abilities in all the areas above.

Date and Time Management

Questions

1. What will the following script output on a Windows machine?

```
<?php
echo strtotime ("November 11, 1952");
?>
```

A. -14462
B. 14462
C. -1
D. 0
E. An error

2. Which function can be used to format a local timestamp according to a specific locale?

Your Answer: _____

3. What does the following script do?

```
<?php
$a = array_sum (explode (' ', microtime()));
for ($i = 0; $i < 10000; $i++);
$b = array_sum (explode (' ', microtime()));
echo $b - $a;
?>
```

A. It measures the amount of time that the for loop requires to execute
B. It determines the server's internal clock frequency
C. It calculates the deviation between the computer's internal hardware clock and the software clock maintained by the operating system
D. It measures the amount of time required to execute the for loop as well as one array_sum() and one microtime() call
E. It measures the amount of time required to execute the for loop as well as two array_sum() and two microtime() calls.

4. What function name should replace the question marks in the following script?

```
<?php
for ($i = 0; $i < 100; $i++) {
        $day = rand (1, 31);
        $month = rand (1, 12);
        $year = rand (1000, 2500);
        if (????????? ($month, $day, $year)) {
                echo "$month/$day/$year is a valid date\n";
        } else {
                echo "$month/$day/$year is not a valid date\n";
```

```
        }
    }
    ?>
```

A. date()
B. strftime()
C. microtime()
D. checkdate()
E. mktime()

5. What will the following script output on a Windows machine? (Choose 2)

```
<?php
echo mktime (0, 0, 0, 11, 11, 1952); // November 11, 1952
?>
```

A. A warning
B. An error
C. -1 and a warning
D. -14462
E. A notice stating that mktime is not supported

6. Keeping into consideration that the EST time zone is one hour ahead of the CST time zone (that is, at any given time it will be one hour later in EST than in CST), what will the following script output?

```
<?php
$a = strtotime ('00:00:00 Feb 23 1976 EST');
$b = strtotime ('00:00:00 Feb 23 1976 CST');
echo $a - $b;
?>
```

A. -3600
B. 3600
C. 0
D. -1
E. 1

7. When retrieving and manipulating date values from a database, which of the following techniques will help prevent bugs? (Choose 3)

A. Always ensure that the date values are in the same time zone as the web server
B. If the date needs to be manipulated and converted to a UNIX timestamp, ensure that the resulting value will not cause an overflow
C. Use the database's facilities for testing a date's validity
D. If possible, use the database's facilities for performing calculations on date values
E. Write your code so that dates are only manipulated in PHP

8. What would happen if the following script were run on a Windows server set to Moscow, Russia's time zone?

```
<?php
echo gmmktime(0, 0, 0, 1, 1, 1970);
?>
```

A. It would output the number 0
B. It would output the number -1
C. It would output the number 1
D. It would raise an error
E. It would output nothing

9. Which of the following definitions describes the time function?

A. It returns the number of seconds since the UNIX epoch

B. It returns the number of seconds since the UNIX epoch expressed according to the GMT time zone
C. It returns the number of seconds since the UNIX epoch expressed according to the local time zone
D. It calculates the time elapsed since the UNIX epoch and expresses it as an integer number
E. All of the above

10. What will the following script output?

```
<?php
$time = strtotime ('2004/01/01');
echo date ('H:\i:s', $time);
?>
```

A. 00:00:00
B. 12:00:00
C. 00:i:00
D. 12:i:00
E. -1

11. Which of the following expressions will make a cookie expire in exactly one hour (assuming that the client machine on which the browser is set to the correct time and time zone—and that it resides in a time zone different from your server's)?
A. time() + 3600
B. time(3600)
C. gmtime() + 3600
D. gmtime(3600)
E. Both Answers A and C are correct

12. The getdate() function returns _____.
A. An integer
B. A floating-point number
C. An array
D. A string
E. A Boolean

13. What is the simplest way of transforming the output of microtime() into a single numeric value?
A. $time = implode (' ', microtime());
B. $time = explode (' ', microtime()); $time = $time[0] + $time[1];
C. $time = microtime() + microtime();
D. $time = array_sum (explode (' ', microtime()));
E. None of the above

14. Which of the following functions do not return a timestamp? (Choose 2)
A. time()
B. date()
C. strtotime()
D. localtime()
E. gmmktime()

15. What is the difference, in seconds, between the current timestamp in the GMT time zone and the current timestamp in your local time zone?
A. It depends on the number of hours between the local time zone and GMT
B. There is no difference
C. The two will only match if the local time zone is GMT
D. The two will never match
E. None of the above

E-mail Handling and Manipulation

WHERE WOULD THE WORLD be without e-mail? Electronic communication has made it possible for people to stay closer, for companies to conduct their businesses more efficiently and, unfortunately, for spammers to exist.

Luckily, you don't have to be a spammer to enjoy good use of PHP's e-mail capabilities. In fact, whether you run an online store or are writing a forum application, you'll find that being able to send and manipulate e-mail may well be an essential part of your job, since staying in touch with your users is so important.

Programming e-mail management within a PHP script is, at the same time, simple and challenging. If all you want to do is send a simple text e-mail message, then the mail function will do that for you. It's only when you get into the more complicated aspects of electronic messaging—such as HTML mail and attachments—that you need to go above and beyond the basics and learn the way e-mail works.

E-mail Handling and Manipulation

Questions

1. Which one of the following is not a valid e-mail address?
   A. john@php.net
   B. "John Coggeshall" <someone@internetaddress.com>
   C. joe @ example.com
   D. jean-cóggeshall@php.net
   E. john
2. In PHP, the way e-mail is sent from a Windows- or Novell-based machine is different when compared to the behaviour of a UNIX-based machine that uses the sendmail application. In which of the following ways does it differ? (Choose 2):
   A. Windows/Novell installations require no third party software (i.e. sendmail or equivalent) to function.
   B. A UNIX installation will rely on the sendmail_from configuration directive to determine the From: header of the e-mail
   C. You cannot send e-mail with multiple recipients on Windows/Novell installations—each e-mail must be sent separately by calling mail() multiple times.
   D. Depending on the value of sendmail_path configuration directive, they may behave identically.
   E. Unlike Windows/Novell installations, in UNIX you must properly configure the MTA host and port using the SMTP and smtp_port configuration directives.
3. Which of the following steps would you need to undertake if you wanted to send e-mails to multiple recipients or MIME compatible e-mails from PHP?
   A. Add the necessary additional headers to the $message parameter (third parameter) of the mail function.
   B. Communicate directly with the MTA using SMTP from PHP code
   C. Append additional headers to the e-mail using the extended features of the mail function's $additional_headers parameter (fourth parameter) as a string with a newline \n character at the end of each needed header
   D. Although sending e-mails to multiple recipients is allowed, PHP does not support sending of MIME e-mail.
   E. Use the $additional_headers parameter of the mail function to provide a string with a newline and line feed \r\n characters at the end of each needed header.

4. When sending e-mails that have file attachments using MIME (multi-part e-mails), the body of the message and the attachment must be separated by a special string called a boundary. What MIME e-mail header defines this boundary?
   Your Answer: _____

5. When sending HTML e-mail using MIME, it is often desirable to use classic HTML tags such as <IMG> to embed images within your text. Which of the following methods are acceptable for doing so? (Choose 2)
   A. Providing the content of the image file directly in-line within an HTML <IMG> tag in the mail that the e-mail client will automatically render
   B. Providing a URL in the SRC attribute of the <IMG> tag pointing to the image on a independent server where the image is hosted
   C. Embedding the image directly in the e-mail as a separate MIME content block and referencing it within the SRC attribute of the <IMG> tag by its assigned Content ID
   D. Adding the images directly as file attachments and reference them within the SRC attribute of the <IMG> tag by filename
   E. There is only one valid answer listed above
6. Under which of the following conditions can the fifth (last) parameter of the mail function, called $additional_parameters, be used?
   A. Both when sending e-mail from UNIX and Windows/Novell
   B. Only when sending e-mail from Windows/Novell to provide SMTP commands to the MTA
   C. Only in conjunction with the sendmail application or a wrapper application specified by sendmail_path
   D. This parameter is deprecated and is no longer used in PHP

7. Under which of the following circumstances is the Content-Transfer-Encoding MIME header used?
   A. Only when sending non-plaintext (ASCII) data to specify the encoding of the MIME segment
   B. To indicate special formatting of the e-mail, such as if it is to be rendered as HTML, plain text, or rich text
   C. It can be used at any time to specify the encoding of any segment of the MIME e-mail
   D. It can only be used to specify the encoding format (such as base64) of binary segments of a MIME e-mail.
   E. None of the above
8. Which of the following hold true for MIME boundaries specified by the boundary field in a Content-Type header? (Choose 3)
   A. Boundaries must be at least 8 characters in length
   B. Boundaries must be used to separate MIME segments by prefixing them with two hyphens (e.g.: --abcdefghi) to begin the segment and both prefixing and appending two hyphens (for example, --abcdefghi--) to end the segment
   C. Boundaries must be unique in a MIME e-mail
   D. Boundaries cannot be embedded within other boundaries
   E. The actual text used for a boundary doesn't matter
9. Consider the following e-mail:

   From: John Coggeshall <john@php.net>
   To: Joe User <joe@example.comt>
   Subject: Hello from John!
   Date: Wed, 20 Dec 2004 20:18:47 -0400
   Message-ID: <1234@local.machine.example>
   Hello, How are you?

   What headers must be added to this e-mail to make it a MIME e-mail? (Select all that apply)
   A. MIME-Version
   B. Content-Disposition
   C. Content-Type

D. Content-Transfer-Encoding
E. Content-ID

10. Which MIME content type would be used to send an e-mail that contains HTML, rich text, and plain text versions of the same message so that the e-mail client will choose the most appropriate version?
    A. multipart/mixed
    B. multipart/alternative
    C. multipart/default
    D. multipart/related
    E. Not possible using content-types
11. What do you need to do in order for the mail function to work under Windows, assuming that sendmail is not installed on your machine?
    A. Install a sendmail server
    B. Install Microsoft Exchange
    C. Install any mailserver on your computer
    D. Change your php.ini configuration
    E. Write a script that connects to a public e-mailing service
12. Which of the following measures will help prevent cross-site attacks on a form that sends a pre-defined text-only e-mail to a user-provided e-mail address? (Choose 2)
    A. Enforcing the use of GET parameters only
    B. Calling htmlentities() on the e-mail address
    C. Enforcing the use of POST parameters only
    D. Calling htmlentities() on the body of the e-mail
    E. Ensuring that the e-mail address field contains no newline characters
13. How would you manipulate an array so that it can be sent as an attachment to an e-mail and then reconstructed when the e-mail is received?
    A. By transforming it into a string with serialize() and then encoding it with htmlentities()
    B. By saving it to a file and then encoding it with base64_encode()
    C. By transforming it into a string with serialize()
    D. By transforming it into a string with serialize() and encoding it with base64_encode()
    E. By saving it to a file and then encoding it with convert_uuencode()

14. Which of the following is the best way to determine the content type of a file that you want to embed in a MIME/multipart e-mail?
    A. By hardcoding it in your script
    B. By creating a manual list of MIME types and selecting from it based on the file's extension
    C. By writing a stochastic function capable of determining the file's data type based on its contents
    D. By using the mime_content_type function
    E. By uploading the file to an external web service.
15. In an UNIX environment that makes use of a local sendmail installation, how would you ensure that your script will be able to arbitrarily set the sender's name and address in an e-mail? (Choose 3)
    A. By adding a From header to the message
    B. By passing -f as one of the extra parameters
    C. By adding a Reply-to header to the message
    D. By ensuring that the user under which Apache runs is marked as privileged in the sendmail configuration
    E. By ensuring the Apache process runs as root

Database Programming with PHP

IF YOU DEVELOP DYNAMICALLY-DRIVEN websites, the chances that you won't be using a database are very slim. Yet, despite the fact that they can't be done without in any modern web environment, many developers only have a rudimentary understanding of how databases work and what proper database techniques are.

Because PHP supports so many different database types and the Zend Exam is only about being a good PHP programmer, you will find that the questions in this section of the exam are not directed at any particular database management system—after all, most of the companies that commercialize DBMSs, including MySQL AB, have their own certification programs.

Instead, you will be quizzed on your knowledge of database theory and programming, which is extremely important, no matter what DBMS you use for your applications.

Database Programming with PHP

Questions

1. Consider the following SQL statement. Which of the following could be good ideas for limiting the amount of data returned by it? (Choose 2)

```
SELECT * FROM MY_TABLE
```

   A. If possible, convert the query to a stored procedure
   B. If possible within your application, reduce the number of fields retrieved by the query by specifying each field individually as part of the query
   C. If possible, add a WHERE clause
   D. If supported by the DBMS, convert the query to a view
   E. If the DBMS allows it, use prepared statements

2. The dataset returned by a query can be filtered by adding a _____ clause to it.
   Your Answer: _____

3. What does an "inner join" construct do?
   A. It joins two tables together into a third permanent table based on a common column
   B. It creates a result set based on the rows in common between two tables
   C. It creates a result set based on the rows based on one table
   D. It creates a result set by joining two tables together and taking all the rows in common plus the rows belonging to one of the tables
   E. None of the above

4. Which of the following DBMSs do not have a native PHP extension?
   A. MySQL
   B. IBM DB/2
   C. PostgreSQL
   D. Microsoft SQL Server
   E. None of the above

5. Consider the following script. Assuming that the mysql_query function sends an unfiltered query to a database connection already established elsewhere, which of the following are true? (Choose 2)

```
<?php
$r = mysql_query ('DELETE FROM MYTABLE WHERE ID=' . $_GET['ID']);
?>
```

   A. The MYTABLE table contains more than one row
   B. This script should be modified so that user-provided data is properly escaped
   C. Calling this function will result in a row set containing the number of rows left in MYTABLE
   D. Passing the URL parameter ID=0+OR+1 will cause all the rows in MYTABLE to be deleted
   E. This query should include the database name pre-pended to the table name

6. The _____ statement can be used to add a new row to an existing table.

Your Answer: _____

7. Which of the following is true?
   A. Indexing can speed up the insertion of new rows in a table
   B. A good indexing strategy helps prevent cross-site scripting attacks
   C. Indexes should be designed based on the database's actual usage
   D. Deleting a row from a table causes its indexes to be dropped
   E. Indexes are necessary on numeric rows only
8. Can joins be nested?
   A. Yes
   B. No

9. Consider the following database table and query. Which of the indexes below will help speed up the process of executing the query?

```
CREATE TABLE MYTABLE (
  ID          INT,
  NAME        VARCHAR  (100),
  ADDRESS1    VARCHAR  (100),
  ADDRESS2    VARCHAR  (100),
  ZIPCODE     VARCHAR  (10),
  CITY        VARCHAR  (50),
  PROVINCE    VARCHAR  (2)
)
SELECT ID, VARCHAR
FROM MYTABLE
WHERE ID BETWEEN 0 AND 100
ORDER BY NAME, ZIPCODE
```

   A. Indexing the ID column
   B. Indexing the NAME and ADDRESS1 columns
   C. Indexing the ID column, and then the NAME and ZIPCODE columns separately
   D. Indexing the ZIPCODE and NAME columns
   E. Indexing the ZIPCODE column with a full-text index
10. What will happen at the end of the following sequence of SQL commands?

```
BEGIN TRANSACTION
DELETE FROM MYTABLE WHERE ID=1
DELETE FROM OTHERTABLE
ROLLBACK TRANSACTION
```

   A. The contents of OTHERTABLE will be deleted
   B. The contents of both OTHERTABLE and MYTABLE will be deleted
   C. The contents of OTHERTABLE will be deleted, as will be all the contents of MYTABLE whose ID is 1
   D. The database will remain unchanged to all users except the one that executes these queries
   E. The database will remain unchanged

11. What does the DESC keyword do in the following query?

```
SELECT *
FROM MY_TABLE
WHERE ID > 0
ORDER BY ID, NAME DESC
```

   A. It causes the dataset returned by the query to be sorted in descending order
   B. It causes rows with the same ID to be sorted by NAME in ascending order
   C. It causes rows with the same ID to be sorted by NAME in descending order

D. It causes rows to be sorted by NAME first and then by ID
E. It causes the result set to include a description of the NAME field

12. Which of the following is not an SQL aggregate function?
A. AVG
B. SUM
C. MIN
D. MAX
E. CURRENT_DATE()

13. Which of the following correctly identify the requirements for a column to be part of the result set of a query that contains a GROUP BY clause?
A. The column must be indexed
B. The column must be included in the GROUP BY clause
C. The column must contain an aggregate value
D. The column must be a primary key
E. The column must not contain NULL values

14. What will the following query output?

```
SELECT COUNT(*) FROM TABLE1 INNER JOIN TABLE2
ON TABLE1.ID <> TABLE2.ID
```

A. The number of rows that TABLE1 and TABLE2 do not have in common
B. A list of the rows in common between the two tables
C. The number of rows in TABLE1 times the number of rows in TABLE2 minus the number of rows that the two tables have in common
D. A list of the rows that the two tables do not have in common
E. The number 2

15. _____ are used to treat sets of SQL statements atomically.
Your Answer: _____

Stream and Network Programming

WHEN IT COMES TO dealing with external data sources, PHP provides a great many different ways to communicating with the external world. These include facilities like file access and e-mail management. However, both these systems are highly specialized: file management deals with your local filesystem, while the e-mail functions handle only a very narrow aspect of network communications.

For more generic needs, PHP provides a facility called streams, which simply make it possible to treat any data source as a file. For example, the "fopen wrappers" that can be used to load up the contents of an external web page in your script are an excellent example of streams: they let you use file functions to pull content off the Internet.

Finally, more complex operations can be managed through socket programming, which allows for the highest level of flexibility possible.

This section of the exam tests your knowledge of these two areas of expertise.

Stream and Network Programming

Questions

1. Which of the following is not a valid PHP file wrapper resource?
   A. \\server\path\filename
   B. http://www.example.com/index.php
   C. myfile.txt
   D. compress.zlib://myfile.txt
   E. They all are valid
2. What function can you use to create your own streams using the PHP stream wrappers and register them within PHP?
   Your Answer: _____
3. The Stream API provides all but which of the following pieces of information using the stream_get_meta_data function?
   A. Whether there is more data to be read
   B. Whether the stream has timed out or not
   C. Whether the stream is blocking
   D. How much data has passed through the stream
   E. The component parts the stream consists of
4. Which of the following are valid PHP stream transports? (Choose 2)
   A. http
   B. STDIO
   C. ftp
   D. STDOUT
   E. stream

5. The stream context provides information about the data being transported over a given stream and can be used to pass configuration options to which of the following aspects of the stream? (Choose 2)
   A. Stream Filters
   B. Stream Transports
   C. File Wrappers
   D. The individual read / write streams
   E. All of the above
6. What function would you use to open a socket connection manually with the purpose of communicating with a server not supported by a file wrapper?
   Your Answer: _____
7. Which of the following network transports doesn't PHP support?
   A. tcp

B. udp
C. udg
D. pdc
E. unix

8. Assume that you are attempting to communicate with a server that periodically sends data to you over the tcp network transport. The intervals at which this data is sent cannot be predicted, yet you must process it as soon as it arrives. Your script must also perform actions in between data transmissions from the server. When you write your script, you find that it often hangs on the call to fread() if the server takes too long to respond and your other actions aren't being executed properly. How can this problem be fixed?
   A. Decrease max_execution_time, thereby forcing fread() to time out faster
   B. Decrease the timeout time of the connection when calling fsockopen()
   C. Turn off blocking on the socket
   D. Turn on blocking on the socket
   E. None of the above

9. When dealing with timeout values in sockets, the connection timeout can be changed independently of the read/write time out. Which function must be used for this purpose?
   Your Answer: _____

10. Assume that you would like to write a script that reads plain-text data from an arbitrary stream and writes it back to a second stream ROT13-encoded. The encoding must be performed as you are writing to the second stream. What approach would be best suited for these purposes?
   A. Storing the encoded data in a temporary variable and then writing that variable to the stream
   B. Using stream filters to encode the data on-the-fly
   C. Creating a lookup table for ROT13, then encoding the data character by character on the fly as you write it.
   D. There is no way to encode in ROT13 on the fly
   E. None of the above

11. What will the following script output?

```
<?php
echo long2ip (ip2long ('127.0.256'));
?>
```

   A. A warning
   B. 255.255.255.255
   C. -1
   D. 127.0.1.0
   E. 127.0.256.0

12. What will the following script do?

```
<?php
echo getservbyname ('ftp', 'tcp');
?>
```

   A. A list of the FTP servers on the local network
   B. The address of the FTP server called "tcp"
   C. The port associated with the TCP service called "FTP"
   D. A list of the ports associated with all services except FTP

13. What does the gethostbynamel function do?
   A. It returns the IP associated with a host name
   B. It returns a list of all the IPs associated with a host name
   C. It returns the IP associated with a host name using a long-integer representation

D. It returns a list of all the IPs associated with a host name using a long-integer representation
E. None of the above

14. Which of the following operations cannot be performed using the standard ftp:// stream wrapper? (Choose 2)
A. Reading a file
B. Writing a file
C. Establishing a stateful connection and changing directories interactively
D. Creating a new directory

15. How do you create a custom stream handler?
A. By calling stream_wrapper_register() and defining a class to handle stream operations
B. By registering a handler function with stream_wrapper_register()
C. By creating a class that has the same name as the stream wrapper you want to use and then opening it with fopen()
D. By loading the stream wrapper using stream_load()

Writing Secure PHP Applications

THE DOWNSIDE OF PHP'S low barrier-of-entry is the fact that the language is so powerful and easy to use that it's easy to forget the importance of security in the context of web applications.

Despite its significance, security is, possibly, the most-often ignored aspect of a web site. Even more unfortunately, there are so many ways to compromise a system from the inside out that one has to be constantly on the lookout for potential problems.

When the SMEs were designing the exam, a great amount of emphasis was put on security—not only for the questions directly related to it, but on all questions that pertain to every other topic.

Writing a secure application starts with good knowledge of a few fundamental techniques, which you will find covered in this chapter.

Writing Secure PHP Applications

Questions

1. Which of the following is the single most important technique that can help you make your PHP application secure from external intrusion?
   A. Having strong encryption algorithms
   B. Protecting database passwords
   C. Using SSL whenever possible
   D. Validating input
   E. Only using input from trusted sources
2. Consider the following code snippet. Is this code acceptable from a security standpoint? Assume that the $action and $data variables are designed to be accepted from the user and register_globals is enabled.

```
<?php
   if(isUserAdmin()) { $isAdmin = true; }
   $data = validate_and_return_input($data);
   switch($action)
   {
      case 'add':
         addSomething($data);
         break;
      case 'delete':
         if($isAdmin) {
            deleteSomething($data);
         }
         break;
      case 'edit':
         if($isAdmin) {
            editSomething($data);
         }
        break;
       default:
         print "Bad Action.";
   }
?>
```

   A. Yes, it is secure. It checks for $isAdmin to be True before executing protected operations
   B. No, it is not secure because it doesn't make sure $action is valid input
   C. No, it is not secure because $isAdmin can be hijacked by exploiting register_globals

D. Yes, it is secure because it validates the user-data $data
E. Both A and B

3. To prevent cross-site scripting attacks, one should do the following (Choose 3):
   A. Never use include or require statements that include files based on pathnames taken from user input (e.g.: include "$username/script.txt";)
   B. Disable allow_url_fopen unless it is required for the site to function
   C. Avoid using extensions like curl, which opens remote connections
   D. Use functions such as strip_tags() on input taken from one user and displayed to another
   E. All of the above
4. Although the best practice is to disable register_globals entirely, if it must be enabled, what should your scripts do to prevent malicious users from compromising their security?
   A. Filter all data taken from untrusted sources
   B. Filter all data from foreign sources
   C. Initialize all variables prior to use
   D. Use hard-to-guess variable names to prevent malicious users from injecting data
   E. All of the above
5. Often, SQL queries are constructed based on data taken from the user (for instance, a search engine). Which of the following activities can help prevent security breaches?
   A. Placing a firewall between the database server and the web server
   B. Escaping user data so that it cannot be interpreted as commands by the DBMS
   C. Using stored procedures
   D. Using object-oriented programming so that each query can be defined as a separate class

6. Sometimes, it is desirable to use a third-party utility from within a PHP script to perform operations that the language does not support internally (for instance, calling a compression program to compress a file using a format that PHP does not provide an extension for). When executing system commands from PHP scripts, which of the following functions should always be used to ensure no malicious commands are injected? (Choose 2)
   A. Always prefer the backtick operator ` to calls such as exec(), which are less secure
   B. Always use the shell_exec function when possible, as it performs security checks on commands prior to executing them
   C. Use the escapeshellcmd function to escape shell metacharacters prior to execution
   D. Enable the safe_mode configuration directive prior to executing shell commands using ini_set()
   E. Use the escapeshellarg function to escape shell command arguments prior to execution
7. When dealing with files uploaded through HTTP, PHP stores references to them in the $_FILES superglobal array. These files must be processed or moved from their temporary location during the lifetime of the PHP script execution or they will be automatically deleted. What should be done to ensure that, when performing manipulations on a file uploaded from HTTP, the file being accessed is indeed the correct file? (Choose 2)
   A. Validate the filename against what the user's browser reported it to be before using it
   B. Use the file_exists function to make sure the file exists before trying to manipulate it
   C. Check to make sure that the file provided to your script was actually uploaded through HTTP by using the is_uploaded_file function
   D. Move the file to a secure location using move_uploaded_file()
   E. Only trust files that are stored in the directory where PHP temporarily stores uploaded files.

8. In PHP's "Safe Mode," what can configuration directives do to help reduce security risks? (Choose 3)
   A. Limit the execution of shell commands
   B. Limit access to system environment variables
   C. Limit the paths from which PHP can include files using include or require
   D. Limit the permissions of operations that can be performed against a database
   E. All of the above

9. Which of the following actions represents the simplest solution, both from an implementation and maintenance standpoint, to limiting script access to the filesystem to a specific set of directories?
   A. Enabling safe_mode
   B. Using the open_basedir directive to define the directories allowed
   C. Providing custom versions of PHP's filesystem functions that validate the directories being accessed
   D. Setting up the permissions of your file system in such a way that PHP can only get to the directories that are allowed
   E. None of the above, PHP can't restrict access on a per-directory basis
10. When uploading a file, is there a way to ensure that the client browser will disallow sending a document larger than a certain size?
   A. Yes
   B. No
11. Your web server runs PHP as a CGI interpreter with Apache on your Linux machine in the cgi-bin directory, in which it is marked as executable. What happens if someone opens the following URL on your site?

       /cgi-bin/php?/etc/passwd

   A. The contents of the /etc/passwd file are displayed, thus creating a security breach
   B. The operating system will check whether the Apache user has permission to open the /etc/passwd file and act accordingly
   C. The /etc/passwd string will be available as one of the parameters to the script
   D. Nothing. PHP automatically refuses to read and interpret files passed to it as a command-line option when run in CGI mode
   E. PHP will attempt to interpret /etc/passwd as a PHP script

12. Although not necessarily foolproof, what of the following can help identify and prevent potential security risks in your code? (Choose the most appropriate answer)
   A. Being aware of potential security issues as documented in the PHP manual.
   B. Logging all circumstances in which your script data validation fails
   C. Keeping up to date with the latest versions of PHP, especially those that contain security fixes
   D. When using third-party PHP packages, being aware of any security holes found in them and keeping fixes up to date
   E. All of the above
13. When an error occurs on your web site, how should it be treated?
   A. An error message should be displayed to the user with technical information regarding its apparent cause, so that the web master can address it
   B. The error should be logged, and a polite message indicating a server malfunction should be presented to the user
   C. An error message with technical information regarding the error should be displayed so that the user can send it to the webmaster and the error should be logged
   D. Errors should redirect the users to the home page, as to not indicate a malfunction
   E. None of the above

14. Under what circumstances can the following code be considered secure?

```
<?php
  $newfunc = create_function('$a', 'return $a * {$_POST['number']};");
  $newfunc(10);
?>
```

A. Always—the worst case here is that the anonymous function newfunc() will always return a number
B. Only when register_globals is enabled
C. Never. The anonymous function newfunc() runs the risk of allowing the user to manipulate the math performed
D. Never. The anonymous function newfunct() runs the risk of allowing the user to execute arbitrary code on the server
E. Only if allow_url_fopen is enabled

15. Which of the following PHP setups presents the highest number of potential security pitfalls and the lowest performance?

A. Shared Apache module
B. Compiled-in Apache module
C. CGI
D. ISAPI module under IIS

Debugging Code and Managing Performance

NO MATTER HOW EXPERIENCED a developer you are, or how hard you'll try, your applications will have bugs. They're an inevitable part of life, like death and taxes (although usually—but not always—less dangerous an expensive than the latter).

Being able to identify bugs is the first step towards resolving them. In fact, many developers spend countless hours staring blankly at a page of code only because their applications don't have good error-monitoring capabilities in the first place. Ignoring this aspect of programming is a bit like hoping that bugs will never happen: hopeless!

The questions of the Zend Exam that focus around this area test your basic knowledge of topics related to debugging and optimizing code, as well as on the facilities that PHP provides for this specific purpose.

Debugging Code and Managing Performance

Questions

1. Which of the ternary operations below is the equivalent of this script?

```
<?php
if ($a < 10) {
    if ($b > 11) {
        if ($c == 10 && $d != $c) {
            $x = 0;
        } else {
            $x = 1;
        }
    }
}
?>
```

   A. $x = ($a < 10 || $b > 11 || $c == 1 && $d != $c) ? 0 : 1;
   B. $x = ($a < 10 || $b > 11 || ($c == 1 && $d != $c)) ? 0 : 1;
   C. $x = (($a < 10 && $b > 11) || ($c == 1 && $d != $c)) ? 0 : 1;
   D. $x = ($a < 10 && $b > 11 && $c == 1 && $d != $c) ? 1 : 0;
   E. None of the above

2. Which of the following measures can help improving the performance of a script that is slow due to the fact that it needs to pull data from a remote source that is not under your control? (Choose 2)
   A. Installing an opcode cache
   B. Optimizing or upgrading your network connection
   C. Adding more hardware to your web farm
   D. Increasing the RAM available on your server
   E. Using a content cache

3. Which of the following are good steps to undertake when setting up a production webserver? (Choose 2)
   A. Turning off error reporting
   B. Turning on error logging
   C. Turning off error logging
   D. Turning off the display of errors
   E. Using the @ error-suppression operator

4. The _____ operator makes comparisons stricter by checking the types of its operands against each other.
   Your Answer: _____

5. What does an opcode cache do?
   A. It compiles scripts into binary objects to make them run faster

B. It replaces the Zend Engine to provide a faster interpreter
C. It caches a script's output to improve its performance
D. It improves performance by caching the intermediate code produced by the parser
E. It caches a script in memory, thus eliminating the need for reloading it from disk at every iteration

6. Which of the following could result in resource starvation? (Choose 2)
A. Using too little RAM
B. Using a connection capable of low bandwidth only
C. Increasing virtual memory beyond 2GB
D. Allowing too many web server processes to run at the same time
E. None of the above

7. What's missing from the following script? (Choose 2)

```
<?php
$rs = database_query ("select * from mytable where id = " .
                $my_id);
while ($a = database_get_data ($rs)) {
      var_dump ($a);
}
?>
```

A. Parameter escapement
B. Output formatting
C. Error checking
D. A SQL query
E. None of the above

8. Which of the following error types cannot be caught by setting up a custom error handler? (Select two)
A. E_WARNING
B. E_ERROR
C. E_USER_ERROR
D. E_PARSE
E. E_NOTICE

9. When comparing a constant value against a variable, what is a good way to ensure that you will not mistakenly perform an assignment instead?
A. Cast the variable to int
B. Use identity operators
C. Ensure that the constant is the first operand
D. Use ternary operators
E. Enclose the operation in parentheses

10. What is the easiest way to send an error message to a systems administrator via e-mail?
A. By building a custom function that connects to a remote SMTP server
B. By using the mail function
C. By using the error_log function
D. By calling sendmail as an external application
E. By using a webservice

11. Can you turn off all error reporting from within a script with a single PHP function call?
A. Yes
B. No

12. What is the role of a profiler?
A. To create a profile of a script's structure
B. To transform a script into a UML diagram
C. To accurately measure the times needed to execute different portions of a script

D. To calculate the dimensions of a script output when executed through a webserver
E. To identify potential bugs by scanning a script's source for common mistakes

13. A _____ can help identify and solve bugs.
Your Answer: _____

14. What is the difference between trigger_error() and user_error()?
A. trigger_error() also allows a script to throw system-level errors
B. user_error() also allows a script to throw system-level errors
C. user_error() cannot be used in an error handler
D. trigger_error() is only available in PHP 5
E. There is no difference

15. The _____ function can be used to retrieve the sequence of code function calls that led to the execution of an arbitrary line of code in a script. This function is often used for debugging purposes to determine how errors occur.
A. print_r
B. var_dump
C. stack_dump
D. debug_backtrace
E. None of the above