Logical Skills Test

# Brief

For the multiple choice questions, please **HIGHLIGHT** the option you believe to be correct in GREEN.

The long questions, please type your answer in blueensure that you answer in full, if you need more space then please ask for more paper.

1. The letters from the word "ACT" can be arranged to spell out 6 different three-letter combinations: ACT, ATC, CAT, CTA, TAC, TCA.  
   The letters from the word "BOB" can be arranged to spell out 3 different three-letter combinations: BBO, BOB, OBB.  
   How many different four-letter combinations can be made from the letters in the word "TART"?
2. 4
3. 6
4. 12
5. 18
6. 24
7. The letters from the word "ACT" can be arranged to spell out 6 different three-letter combinations: ACT, ATC, CAT, CTA, TAC, TCA.  
   The letters from the word: "BOB" can be arranged to spell out 3 different three-letter combinations: BBO, BOB, OBB.  
   How many different four-letter combinations can be made from the letters in the word "NOON"?
8. 4
9. 6
10. 12
11. 18
12. 24
13. Eight people, J, K, L, M, N, P, Q, and R, are seated in chairs around a rectangular table.  
    One sits at the head, one at the foot, and three on each side.  
    Either P or Q sits at the head.  
    Either M or N sits at the foot.  
    J won't sit next to K.  
    R won't sit next to L.   
    J must sit next to L.   
    If we start at the head of the table and go around the table, which of the following is an acceptable arrangement of the people?
14. Q, K, M, P, N, J, L, R
15. P, N, M, R, Q, J, L, K
16. P, J, R, K, M, L, N, Q
17. Q, K, L, J, N, R, M, P
18. P, Q, R, N, M, K, J, L
19. Eight people, J, K, L, M, N, P, Q, and R are seated in chairs around a rectangular table.  
    One sits at the head, one at the foot, and three on each side.   
    Either P or Q sits at the head.  
    Either M or N sits at the foot.  
    J won't sit next to K.  
    R won't sit next to L.  
    J must sit next to L.   
    If P is seated at the head of the table with M on her left and J on her right, which of the following pair of people could sit with R?
20. L and J
21. K and Q
22. M and Q
23. N and L
24. N and J
25. Seven people, A, B, C, D, E, F, and G, in a studio audience have been selected to be possible contestants in a game show. Only 4 people will actually be in the show. The narrowing of the field must obey the following rules:   
    D can only be selected if A is selected.   
    C cannot be selected unless B is selected.   
    Either A or G must be selected, but not both.   
    Either C or E must be selected, but not both.   
    Which of the following, if selected for the show, will NOT completely determine the makeup of the four people on the show?
26. C and D
27. C and G
28. D and F
29. B and F
30. Seven people, A, B, C, D, E, F, and G, in a studio audience have been selected to be possible contestants in a game show. Only 4 people will actually be in the show. The narrowing of the field must obey the following rules:   
    D can only be selected if A is selected.   
    C cannot be selected unless B is selected.   
    Either A or G must be selected, but not both.   
    Either C or E must be selected, but not both.   
    Which of the following, if selected for the show, will completely determine the makeup of the four on the show?
31. A and D
32. B and C
33. D and F
34. B and D
35. A and C
36. School children who do not like what they are given for lunch always give their salami sandwiches and liverwurst sandwiches to one of six children, A, B, C, D, E, and F.  
    Salami sandwiches are given first to A or B.  
    Liverwurst sandwiches are given to either A, B, or C.  
    If a child doesn't want the sandwich, it is passed on to another child as follows:  
    From A to C if it is salami; from A to D if it is liverwurst.   
    From B to either A or C, whatever the sandwich.   
    From C to D if it is salami; from C to E if it is liverwurst.   
    From D to either C or E, whatever the sandwich.   
    From E to F, whatever the sandwich.   
    F eats every sandwich given to him.   
    A liverwurst sandwich eaten by F could have reached him by which of the following sequences of children?
37. A to B to E
38. A to C to D
39. A to D to E
40. C to B to D
41. C to B to D to E
42. Let (X,Y) represent position X and position Y standing next to each other, with X on the left and Y on the right.  
    A, B, C, D, E, and F are standing in a straight line. The following information is given:  
    (B,F)  
    (A,C)  
    (F,E)  
    (D,A)  
    (C,B)  
    Who are standing on the ends of the line?
43. A and F
44. A and E
45. D and E
46. D and F
47. E and F
48. A, B, C, D, E, F, G, and H are eight coworkers, only some of whom email each other.  
    The following people email each other back and forth:  
    A and B  
    A and F  
    B and E  
    C and D  
    C and G  
    D and E  
    D and H  
    G and H  
    No one else emails anyone else.  
    If F sends out an email that eventually reaches G, who are two coworkers who MUST have handled the email?
49. A and C
50. A and D
51. B and G
52. H and D
53. F and G
54. There are six people (T, V, W, X, Y, Z), some of whom communicate by fax.  
    Faxes are only sent:  
    from T to X  
    from T to Z  
    from W to Y  
    from V to T  
    from V to W  
    from X to V  
    from Y to Z  
    No one else ever faxes anyone else.   
    What is the number of people who can receive, either directly or indirectly, a fax from V?
55. 1
56. 2
57. 3
58. 4
59. 5
60. Which of the following tags will always be recognized by PHP, regardless of configuration?
61. <? ?>
62. < ? = ? >
63. <% %>
64. <script language=”PHP”></script>
65. What is the output of the following expression:  
    echo 5 & 7;
66. 1
67. 2
68. 3
69. 4
70. 5
71. What is the output of the following expression:   
    $x = 5;   
    echo $x >> 2;
72. 0
73. 1
74. 2
75. 3
76. 5
77. What is the output of the following expression:  
    $f = 7;  
    function myFunction(&$d)  
    {  
     return $d++;  
    }  
    myFunction($f);  
    echo $f;
78. 7
79. 8
80. 78
81. None of the above
82. Which of the following functions removes an element from the end of the array?
83. array\_shift
84. array\_unshift
85. array\_pop
86. array\_slice
87. array\_remove
88. Does sort() sort numeric arrays in a numerical order or in a string-like order?   
    e.g.  
    $a = array("5", "7", "11", "2", "10");   
    sort($a);
89. It sorts numerically, and the values of the array are converted to integers.
90. It sorts numerically, but the values of the array remain strings.
91. It sorts string-like, and the values of the array are converted to integers.
92. It sorts string-like, and the values of the array remain strings.
93. Which of the following commands can remove a single element from an array?
94. array\_push
95. array\_unset
96. array\_remove
97. unset
98. remove
99. What is the output of the following code:

class myClass

{

public $z;

public function \_\_construct($z = 5)

{

$this->z = 10;

}

}

$a = new myClass();

$b = $a;

$b->z = 0;

echo $a->z;

1. 0
2. 5
3. 10
4. 15
5. What is the output of the following code:  
   class myClass  
   {   
   public $x;   
   function myMethod()   
   {   
   echo $this->x;   
   }   
   }   
   $a = new myClass();   
   $a->x = 10;   
   $b = $a;   
   $b->x = 20;   
   $c = clone $b;   
   $c->x = 30;   
   $a->myMethod();   
   $b->myMethod();   
   $c->myMethod();
6. 1010101
7. 202030
8. 303030
9. What is the output of the following code:   
   for($i = 0; $i<= 5; $i++)  
   echo $i;
10. 01234
11. 012345
12. 12345
13. 123456
14. Which line of code is the equivalent to the following while loop:  
    $i = 0;  
    while ($i< 10)  
    {  
    $i = $i + 1;  
    }
15. do ($i = 0; $i< 10; $i++);
16. for ($i = 0; $i< 10; $i++);
17. foreach ($i = 0; $i< 10; $i++);
18. What is the output of the following code:  
    switch (5 % 2)  
    {  
    case 1:  
    echo 1;  
    case 2:   
    echo 2;  
    case 3:  
    echo 3;  
    break;  
    default:  
    echo 0;  
    }
19. 0
20. 1
21. 12
22. 123
23. 0
24. What is the output of the following expression:  
    echo substr('abcdefgh', -4, -2);
25. dc
26. ghab
27. ef
28. Which of the following functions returns a string containing a string representation of all the array elements in the same order, with the glue string between each element
29. split
30. explode
31. implode
32. strchr
33. Which of the following functions returns formatted output as a string?
34. printf
35. sprintf
36. vprintf
37. All of the above
38. What is the difference between a class and an interface?
39. Classes can define methods whereas interfaces may only declare them.
40. Classes can only extend one parent class, but they can implement multiple interfaces.
41. All methods of an interface must be public, whereas the methods of classes can be private, protected, or public.
42. All of the above
43. What is the value of $b after the following code is executed:  
    $animal = array('type' => 'dog', 'name' => 'Max');  
    $b = (object) $animal;
44. The value of $b will be the same, because an array is an object.
45. The value of $b will contain an empty object of type stdClass.
46. The value of $b will contain an object of type stdClass with type and name as properties.
47. The value of $b will contain an object of type animal with type and name as properties.
48. An E\_ERROR message will be thrown; you cannot cast arrays to objects.
49. You are starting a new business and want to look at creating a database to store customer information, stock information and sales.

Bare in mind you will need to look at pulling reports in the most optimal way to identify:

- Top 10 customers by purchase (cost) - BIG SPENDERS

- Top 10 customers by purchase (count) - QUANTITY OVER QUALITY

- Top 3 Sales People by Nett Profit on Sales

- Top 3 Sales People by Gross Sales value

Your tasks are:

- Draw the RDD design and include your datatypes for your fields

- Write out the four statements that would allow you to generate the necessary report

|  |
| --- |
| CUSTOMER |
| Id PK AUTO\_INCREMENT INT(11) name varchar(20)  Email varchar(60)  Purchase\_amount float  Purchase\_item varchar(60)  Purchase\_date datetime  Sales\_person\_id FK int(11) |

|  |
| --- |
| SALES |
| Id PK AUTO\_INCREMENT INT(11)  sales\_person\_id FK int(11)  sold\_item varchar(40)  amount float  created\_at datetime |

SELECT \* FROM CUSTOMERS GROUP BY id

ORDER BY Purchase\_amount DESC

LIMIT 10

SELECT count( \*) FROM CUSTOMERS GROUP BY id

ORDER BY Purchase\_amount DESC

LIMIT 10

SELECT sales\_person\_id, sum(amount) FROM `sales`

WHERE month(created\_at) = month(CURDATE())

GROUP BY sales\_person\_id

ORDER BY amount DESC LIMIT 3

SELECT sales\_person\_id, sum(amount) FROM `sales`

WHERE month(created\_at) <= 12

GROUP BY sales\_person\_id

ORDER BY amount DESC LIMIT 3

Assessment Project

# Standards

* Use bootstrap for styling
* If being done in PHP:
  + Use a well-documented PHP framework or any PHP Framework you are comfortable with
* If being done in Python:
  + Use the Django framework or structure it in a well defined and legible way
* MySQL for the databases (a setup script should be able to be placed on a server and accept a user name and password as a parameter to create and install the database and credentials needed for the project to run), as well as pre-population of data for the users. [This must be supplied as part of the instructions]
* RDD to be provided (*jpg*)
* Code must be well documented and commented
* Security measures must be demonstrated (i.e. XSS, etc)
* Appropriate error messages returned
* Full project system set up and installation instructions to be provided, please treat the system as a blank install with no pre-requisites, this will show your ability to set a new environment up from scratch. Please prepare for an Ubuntu 18.04 server installation

# Brief

**Section 1:**

The basics requirements of the project are as follows. Create a web basedsystem that has basic user authentication (user name and password).

Off that depending on the user type / access rights, they need to either perform:

* Log a support ticket
* Send Emails to person logging ticket
* Anonymous view by ticket number to see status on the ticket

Log a Support Ticket (scope for fields to be defined by person completing the project – we want to see some insight here)

* Ability to log a support ticket for three categories (Sales, Accounts, IT)
* Capture Personal details of the person logging the ticket [This will show how you think of personal details]
* Capture the GPS Coordinates where the Support agent is capturing this from
* Send an email to the email address captured for the ticket (and trace who logged the ticket)
* Ability to update the status of the ticket (newly logged, in progress, resolved)
* Ability to view reports of queries logged:
  + By date period (start and end date);
  + Ability to order queries by
    - first name;
    - last name;
    - date logged [default result set];
    - status of query (newly logged, in progress, resolve)

Queries should be paginated to 10 per page.

Anonymous view:

The email sent above should have a link for the person that receives the email to be able to view their status of their query

Please provide login details for 3 different support users (must be auto created with your setup script for the database)

**Section 2**:

This section is a part that will show the ability to write complex queries & create an associated data set, upload and read files; show creativity and out the box thinking, a new web location must be created for this.

Create a link on the page called “Complex Query”, you will need to create three tables (the structure of the data is up to you), these tables must be called PersonalDetails; Interests & Documents (you can have more tables if you want to categorise documents, etc);

The fields in the tables can be derived from the information below, you must create a script that will randomly populate the tables with:

* At least 50 people; their related interests and their interests related documents [not physical documents but a dummy link to a random unique file name];

You need to create the necessary links to the table, bare in mind the following:

* You can not have documents if your interests are Sport or Fishing;
* Everyone must have at least 3 interests and at most 12 interests;
* You can have multiple documents linked to your interests if your interests are Gardening; Animals and / or Children;
* There should be at least 15 different interest types [be creative]
* Documents are NOT compulsory for every linked interest (your script should keep a 60% success rate between documents linked and 40% documents not linked)
* You should randomize the number of documents associated if your interests fall within in the criteria

Create buttons that will execute the following queries (and show the necessary queries with the result set):

* Animal Lovers with only 1 document linked;
* Children & Sport Lovers;
* Unique Interests and the count of people without documents linked to their interests
* People with 5 or 6 interests with at least one of the interests having multiple documents

Create a second link / menu item called “File Manipulation”:

This link must open a page that allows a person to upload either a:

* CSV;
* TXT or
* XLSX file

Prompt for the ordering [alphabetically or string length]

The file will have a single column of data that will contain a random list of strings, the file must be:

* Uploaded and read;
* Deduplicated;
* Create an output xlsx (no matter the input) and the order of the data must be A-Z [alphabetically] or the length of the characters in the strings – shortest strings first ending with the longest strings [string length]