CpSc 4620/6620 Midterm Exam

Name:_____ ID:_____

Question #1 (20 points): Are the following statements **true** or **false**?

1. HTML elements must have content, which is usually surrounded by a pair of tags. (F)
2. HTML Tags can have attributes which always come in name/value pairs, and attribute values must be enclosed in double style quotes. (F)
3. In PHP, you can use both single quotes (' ') and double quotes (" ") for strings. (T)
4. HTTP is a protocol only used to support communication between web browsers and web servers; it cannot be used for other purposes. (F)
5. In addition to the "well known" TCP port 80, other ports can be used for HTTP servers (T)
6. A HTTP session consists of a client request followed by a server response (T)
7. HTTP can only support one request-reply exchange over a single TCP connection (F)
8. In PHP, the die() and exit() functions do the exact same thing. (T)
9. The HTML 5 syntax requires a doctype to be specified to ensure that the browser renders the page in standards mode. (T)
10. The server side script directly input/output from/to web clients. (F)
11. In a dynamic web application, database is necessary because database is the only possible way to store the dynamic application data. (F)
12. In PHP, a constant is case insensitive. However, constant identifiers are always uppercase by convention. (F)
13. PHP has an error control operator: "@". When it is prepended to an expression, it will immediately report any error caused by the expression and store the error message in a global variable $php_errormsg. (F)
14. PHP supports passing by reference for function arguments. To achieve this, you have to prepend an ampersand (&) to the argument name in the function definition, and prepend an ampersand (&) to the variable name passed in when calling the function. (F)
15. According to CSS cascading order, an external style sheet will always be overridden by the internal style sheet. (F)
16. In HTML 5, style attribute is deprecated because all styles will be handled by CSS style sheets. (F)
17. HTML 5 introduced the <video> and <audio> tags because the web browser cannot playback video and audio files without these tags. (F)
18. Elements "frame" and "frameset" are not in HTML5 because using them damages usability and accessibility. (T)
19. The MySQL extensions must be compiled into your PHP package; otherwise, the PHP engine will issue a warning when your MySQL related PHP functions are called. (F)
20. Because a PHP function can only return one value, the only way to obtain multiple results out of a function is through passing by reference. (F)

Question #2 (20 points): Given a database containing the following tables:

Author:

au_id	au_lname	au_fname	address	city	state
123-456-789	White	John	123 maple way	Clemson	SC
345-234-567	Green	David	345 tiger blvd	Clemson	SC
333-567-987	Dull	Ann	3410 Blonde St.	Berkeley	CA

Title:

title_id	title	type	price	pub_id
A1234	PHP Programming	Technical	78.0	2345
B3452	Wall Street Secrets	Business	1000.0	1234
C3648	Is Anger the Enemy?	Psychology	10.99	3566

Publisher:

pub_id	pub_name	city
2345	Low tech warehouse	Columbia
1234	Dow Jones	New York
3566	Bob's Publishing	Greenville

Author_Title:

au_id	title_id
333-567-987	A1234
123-456-789	B3452
345-234-567	C3648

Write SQL statements to insert or retrieve information from this database:

1) Write four SQL statements to create these tables. (4 points)

CREATE TABLE Author (au_id integer primary key, au_fname varchar[50], au_lname varchar[50], address varchar[100], state varchar[30], city varchar[30]);

CREATE TABLE Publisher (pub_id integer primary key, pub_name varchar[100], city varchar[30]);

CREATE TABLE Title (title_id integer primary key, title varchar[200], price float, type varchar[30], pub_id integer);

CREATE TABLE Author_Title (au_id integer, title_id integer);

The students may get full credit without the following:

ALTER TABLE Title ADD FOREIGN KEY(pub_id) REFERENCES Publisher(pub_id);

ALTER TABLE Author_Title ADD FOREIGN KEY(au_id) REFERENCES Author(au_id);

ALTER TABLE Author_Title ADD FOREIGN KEY(title_id) REFERENCES Title(title_id);

2) Write an SQL query statement to list title, type, and price of the books whose prices are less than 80. (4 points)

SELECT title, type, price FROM Title WHERE price < 80;

3) Write an SQL query statement to list pub_name of the publishers who publish the title "Wall Street Secrets". (4 points)

```
SELECT pub_name
FROM Title INNER JOIN Publisher on Title.pud_id = Publisher.pub_id
WHERE Title.title = "Wall Street Secrets"
```

4) Write an SQL query to list au_lname, au_fname, title, and price of the book having the lowest price in this database. (4 points)

```
SELECT au_lname, au_fname, title, price
FROM Author INNER JOIN Author_Title on Author.au_id = Author_Title.au_id
        INNER JOIN Title on Author_Title.title_id = Title.title_id
ORDER BY price LIMIT 1;
```

5) Write two queries, one uses "like" and another uses "rlike", to retrieve information for all authors whose cities start with "C" and end with "n". (4 points)

SELECT * FROM Author WHERE city LIKE "C%n"

SELECT * FROM Author WHERE city RLIKE "^C" AND city RLIKE "n$"

SELECT * FROM Author WHERE city RLIKE "^C.*n$"

Question #3 (20 points): Please write an HTML script (use CSS style sheet if necessary) to present the college playoff results in a web page in the format shown as the following:

```
<!DOCTYPE html>
<html>
<head>
<style>
	table {
		margin-left: auto;
		margin-right: auto;
	}
	td.a {
	   background-color: yellow;
	   font-family: arial;
	   font-size: 36px;
	   color:black;
	   text-align:center;
	}
	td.b {
	   background-color: green;
	   font-family: Times;
	   font-size: 20px;
	   color: blue;
	   vertical-align: top;
	   width: 250px;
	}
	td.c {
	   background-color: red;
	   font-family: Times;
	   font-size: 20px;
	   color: yellow;
	   vertical-align: top;
	   width: 250px
	}
	td.d {
	   background-color: cyan;
	   font-family: arial;
	   font-size: 24px;
	   color: red;
	   text-align:center;
	}

	ul {
	  list-style-type: circle;
	}
</style>
</head>
```

```
<body>

<table>
<tr>
    <td class="a" colspan="2"> <b>College Playoff Results</b> </td>
</tr>
<tr>
<td class="b">   <b>Playoff Teams:</b>
    <ol style="font-size: 18px">
        <li>Alabama</li>
        <li>Clemson</li>
        <li>Ohio</li>
        <li>Notre Dame</li>
    </ol>
</td>
<td class="c">   <b>Finalists:</b>
    <ul style="font-size: 18px">
        <li>Alabama</li>
        <li>Ohio</li>
    </ul>
</td>
</tr>
<tr>
     <td class="d" colspan="2"> <b>Championship: Alabama</b> </td>
</tr>
</table>
</body>
</html>
```

Question #4 (20 points): Assume you have a database containing two tables, “pet” and “event”. The column names and the content of the “pet” table are shown in the following table:

pet:

name	owner	species	sex	birth	death
Fluffy	Harold	cat	f	2013-02-04	
Claws	Gwen	cat	m	2014-03-17	
Snow	Diane	cat	f	2000-04-11	
Buffy	Harold	dog	f	2009-05-13	
Fang	Benny	dog	m	2010-08-27	
Feng	James	dog	f	2011-11-11	
Bowser	Diane	dog	m	1999-08-31	2015-07-29
Chirpy	Gwen	bird	f	2018-09-11	
Whistler	Gwen	bird		2017-12-09	
Flyer	James	bird	m	2013-03-12	
Slim	Benny	snake	m	2016-04-29	

The column names and the content of the “event” table are shown in the following table:

event:

name	date	type	remark
Fluffy	2015-05-15	litter	5 kittens, 3 female, 2 male
Buffy	2013-06-23	litter	4 puppies, 2 female, 2 male
Buffy	2014-06-19	litter	3 puppies, 2 female, 1 male
Snow	2005-05-05	litter	2 kittens, 1 female, 1 male
Chirpy	2019-03-21	vet	needed beak straightened
Slim	2017-08-03	vet	broken rib
Bowser	2011-10-12	kennel	
Feng	2014-03-15	vet	broken legs
Fang	2011-10-12	kennel	
Fang	2018-08-28	birthday	Gave him a new chew toy
Claws	2018-03-17	birthday	Gave him a new flea collar
Flyer	2014-03-12	birthday	First birthday
Whistler	2018-12-09	birthday	First birthday

Please list the return results of the following SQL queries. You need to list all the resulting table column names and all rows returned by the query

a.
```
SELECT name, owner, species
FROM pet WHERE name RLIKE "[CS].*";
```

```
+--------+--------+---------+
| name   | owner  | species |
+--------+--------+---------+
| Claws  | Gwen   | cat     |
| Snow   | Diane  | cat     |
| Chirpy | Gwen   | bird    |
| Slim   | Benny  | Snake   |
+--------+--------+---------+
```

b. SELECT name, owner, species
FROM pet WHERE name LIKE "%r";

```
+----------+--------+---------+
| name     | owner  | species |
+----------+--------+---------+
| Bowser   | Diane  | dog     |
| Whistler | Gwen   | bird    |
| Flyer    | James  | bird    |
+----------+--------+---------+
```

c. SELECT pet.name, pet.owner, event.date, event.remark
FROM event INNER JOIN pet ON event.name = pet.name
WHERE event.type = "litter" AND event.date < "2014-01-01";

```
+--------+--------+------------+-----------------------------+
| name   | owner  | date       | remark                      |
+--------+--------+------------+-----------------------------+
| Buffy  | Harold | 2013-06-19 | 4 puppies, 2 female, 2 male |
| Snow   | Diane  | 2005-05-05 | 3 kittens, 1 female, 2 male |
+--------+--------+------------+-----------------------------+
```

d. SELECT owner, COUNT(*) as cnt
FROM pet
GROUP BY owner
ORDER BY cnt DESC;

```
+--------+-----+
| owner  | cnt |
+--------+-----+
| Gwen   |   3 |
| Diane  |   2 |
| Harold |   2 |
| Benny  |   2 |
| James  |   2 |
+--------+-----+
```

e.
```
SELECT pet.name,
(YEAR(date)-YEAR(birth)) - (RIGHT(date,5)<RIGHT(birth,5)) AS age, remark
FROM pet INNER JOIN event ON pet.name = event.name
WHERE event.type = 'vet'
ORDER BY age;
```

```
+--------+------+--------------------------+
| name   | age  | remark                   |
+--------+------+--------------------------+
| Chirpy |    0 | needed beak straightened |
| Slim   |    1 | broken rib               |
| Feng   |    2 | broken legs              |
+--------+------+--------------------------+
```

Question 5 (20 points): In mathematics, Pascal's triangle is a triangular array of the binomial coefficients. The rows of Pascal's triangle are conventionally enumerated starting with row n = 0 at the top (the 0th row). The entries in each row are numbered from the left beginning with k = 0 and are usually staggered relative to the numbers in the adjacent rows. The triangle may be constructed in the following manner, as shown in the following table: In row 0 (the topmost row), there is a unique nonzero entry 1. Each entry of each subsequent row is constructed by adding the number above and to the left with the number above, treating blank entries as 0. For example, the initial number in the first (or any other) row is 1 (the sum of 0 and 1), whereas the numbers 1 and 3 in the 3rd row are added to produce the number 4 in the 4th row (Note: the row count starts at 0 not 1).

9-row Pascal's Triangle

1								
1	1							
1	2	1						
1	3	3	1					
1	4	6	4	1				
1	5	10	10	5	1			
1	6	15	20	15	6	1		
1	7	21	35	35	21	7	1	
1	8	28	56	70	56	28	8	1

Please write a PHP script to display a 9-row pascal's triangle in a webpage in the above table format:

```php
<?php
    echo "<table style='border: 1px solid black'>";
    echo "<caption><b>9-row Pascal&amp;apos;s Triangle</b></caption>";
    $first = array("0", "1", "0", "0", "0", "0", "0", "0", "0", "0", "0");
    $second = array("0", "0", "0", "0", "0", "0", "0", "0", "0", "0", "0");
    for($i=0; $i<9; $i++){
        echo "<tr>";
        for($j=1; $j<=$i+2; $j++) {
            $second[$j] = $first[$j-1] + $first[$j];
        }
        for($k=1; $k<=$i+1; $k++) {
            echo "<td style='border: 1px solid black'>".$first[$k]."</td>";
        }
        for($k=$i+2; $k<10; $k++)
            echo "<td style='border: 1px solid black'> </td>";
        echo "</tr>";
        $first = $second;
    }
    echo "</table>";
?>
```