5. SQL works with relational databases. What does SQL stand for? (2%) How does relational database store its data? (3%) Write an SQL query that retrieves first and last names, ordered by age, from the following Employees table. (5%)

<table>
<thead>
<tr>
<th>ID</th>
<th>LastName</th>
<th>FirstName</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>116</td>
<td>Kay</td>
<td>Wang</td>
<td>34</td>
</tr>
<tr>
<td>123</td>
<td>Honou</td>
<td>Liu</td>
<td>33</td>
</tr>
<tr>
<td>145</td>
<td>Carsen</td>
<td>Chang</td>
<td>24</td>
</tr>
<tr>
<td>165</td>
<td>Paul</td>
<td>Lee</td>
<td>56</td>
</tr>
<tr>
<td>124</td>
<td>Jay</td>
<td>Lin</td>
<td>28</td>
</tr>
</tbody>
</table>

6. Assuming that we use the following function to obtain the factorial of an integer.
```c
int factorial(int num);
```
(a) Write the entire function in an iterative style – (5%)
(b) Write the entire function in a recursive style – (5%)

7. (a) Using C++ language, write a function (odd_even()) that takes an integer parameter (num) and returns 1 if that integer is an odd number, otherwise returns 0. (5%)
(b) In C++ language, if originally $x$, $y$, $z$ are 1, 2, 3, respectively, what is the result of executing the following code? (5%)
```c
if (z == 1) { y++; z--; } else --x; cout << x << y << z << endl;
```

8. Write an algorithm to obtain the value of a postfix expression using stack and use the following expression to explain how your algorithm works. (10%)

```
3 6 2 / - 1 4 * +
```
9. Given the following class tv_show,

```cpp
class tv_show
{private:
    char title[30];
    int length; // 30 or 60 minutes
    char kind; // c - comedy, d - drama, i - infomercial
public:
    tv_show(char s[], int l, char k)
    {strcpy(title, s); length = l; kind = k;}
};
```

(a) Explain ADT in terms of class tv_show. (5%)
(b) Explain the usage of constructor in terms of class tv_show. (5%)
(c) If the main function is written as shown below, what code should be added into the class declaration of tv_show to ensure a successful compilation? (10%)

```cpp
int main()
{
    tv_show one("One Day to Live", 60, 'd');
    tv_show two;
    return 0;
}
```