Started on	Sunday, 19 March 2023, 12:06 PM
State	Finished
Completed on	Sunday, 19 March 2023, 12:16 PM
Time taken	10 mins 13 secs
Marks	8.00/8.00
Grade	**10.00** out of 10.00 (**100**%)

Question 1

Correct

Mark 1.00 out of 1.00

Given below is a function (isNumberEven) that predicts whether a given number is even. The function should return True if a number is even and False otherwise. Fill in the blanks of the return statements:

isNumberEven(N)

```
if N == 0 :
    return [True] ✔
elif N ==1 :
    return [False] ✔
else:
    return [isNumberEven(N-2)] ✔
```

[isNumberEven(N/2)] [isNumberEven(N-1)]

The thread at freecodechamp explains this in detail

https://forum.freecodecamp.org/t/even-odd-number-check-using-the-recursive-function/310067

Question 2

Correct

Mark 1.00 out of 1.00

Consider a situation where you don't have function to calculate power (pow() function in C) and you need to calculate x^n where x can be any number and n is a positive integer. What can be the best possible time complexity of your power function?

a. O(nLogn)

b. O(n)

c. O(LogLogn)

d. O(Logn) ✔

Power of a number can be calculated recursively.

Refer https://www.geeksforgeeks.org/write-a-c-program-to-calculate-powxn/

The correct answer is: O(Logn)

Question 3

Correct

Mark 1.00 out of 1.00

In recursion, the condition for which the function will stop calling itself is_____.

a. Worst case

b. Best case

c. Base case ✔

d. There is no such condition

The correct answer is: Base case

Question 4

Correct

Mark 1.00 out of 1.00

Output of the following program is?

```
void function( int n)
{
   if(n==0)
      return;
   printf("%d ",n*2);
   unction(n-1);
}

int main()
{
   function(100);
   return 0;
}
```

a. 100, 99, 98, 97, ... 0

b. 200, 199, 198, 197, ... 1

c. 200, 198, 196, 194, ... 2 ✔

d. 100

The correct answer is: 200, 198, 196, 194, ... 2

Question 5

Correct

Mark 1.00 out of 1.00

Consider Following Code

```
void my_recursive_function()
{
    my_recursive_function();
}

int main()
{
    my_recursive_function();
    return 0;
}
```

What will happen when the above snippet is executed?

- a. The code will be executed successfully and random output will be generated
- b. The code will run for some time and stop when the stack overflows ✔
- c. The code will be executed successfully and no output will be generated
- d. The code will show a compile time error

The correct answer is: The code will run for some time and stop when the stack overflows

Question 6

Correct

Mark 1.00 out of 1.00

Algorithm(s) which use divide and conquer approach

- a. Insertion Sort
- b. Selection Sort
- c. Merge sort ✔
- d. Binary search ✔

The correct answers are: Binary search, Merge sort

Question 7

Correct

Mark 1.00 out of 1.00

Consider the following functions,

```
func1(N)
if N == 0:
        return True
else:
        return func2(N-1)

func2(N)
if N == 0:
        return False
else:
        return func1(N-1)
```

What are the above types of recursive functions called ?

Select one:

- a. Tail Recursion
- b. Linear Recursion
- c. Nested Recursion
- d. Multiple Recursion
- e. Mutual Recursion ✔

Your answer is correct.

"Mutual recursion is a form of recursion where two mathematical or computational objects, such as functions or data types, are defined in terms of each other" - GeeksforGeeks.

Here the function func1 calls func2 and vice versa, making both functions dependent on each other.

The correct answer is:
Mutual Recursion

Question 8

Correct

Mark 1.00 out of 1.00

In a little game, a computer is going to randomly select an integer from 1 to 2000. You'll keep guessing numbers until you find the computer's number, and the computer will tell you each time if your guess was too high or too low. How many quesses you need atmost in your worst case scenario given you use an optimal strategy?

Answer: 11 ✔

The correct answer is: 11