Started on	Wednesday, 30 July 2025, 4:28 PM
State	Finished
Completed on	Wednesday, 30 July 2025, 4:40 PM
Time taken	12 mins 34 secs
Marks	27.00/35.00
Grade	**77.14** out of 100.00

Question 1
Complete
Mark 0.00 out of 1.00

Which value will fib(5) return in a standard 0-based Fibonacci recursive function?

- a. 8
- b. 13
- c. 5
- d. 3

Question 2
Complete
Mark 1.00 out of 1.00

Given this code, how many times is fib(2) computed when calling fib(5)?

- a. 2
- b. 5
- c. 3
- d. 1

Question 3
Complete
Mark 1.00 out of 1.00

If you can take 1, 3, or 5 steps at a time, what is the recurrence relation for total ways?

- a. f (n) = f(n-1) + f(n-3) + f(n-5)
- b. f (n) = max(f(n-1), f(n-3), f(n-5))
- c. f (n) = f(n-1) * f(n-3) * f(n-5)
- d. f (n) = f(n-1) + f(n-2) + f(n-3)

Question 4
Complete
Mark 1.00 out of 1.00

What is the base case for recursively reversing a string?

- a. When the string is empty or has length 1
- b. When the string contains only numbers
- c. When the string is palindrome
- d. When the string starts with 'a'

Question 5
Complete
Mark 1.00 out of 1.00

What happens if the base case is missing in a recursive function?

- a. Output is always correct
- b. Program runs faster
- c. Infinite recursion and stack overflow
- d. None of these

Question 6
Complete
Mark 0.00 out of 1.00

Which of the following is an example of tree recursion?

- a. Computing factorial
- b. Computing nth Fibonacci number using naive recursion
- c. Reversing a string
- d. Linear search

Question 7
Complete
Mark 1.00 out of 1.00

Which type of recursion does the following represent?

```
public void example(int n) {
   if (n > 0) {
      example(n - 1);
      System.out.println( n );
   }
}
```

- a. Indirect recursion
- b. Tail recursion
- c. Head recursion
- d. Tree recursion

Question 8
Complete
Mark 0.00 out of 1.00

How do you efficiently avoid infinite loops in a recursive happy number check?

- a. Use a set to track seen numbers
- b. Use a queue
- c. Limit recursion depth to 10
- d. Use a stack

Question 9
Complete
Mark 1.00 out of 1.00

For 'climbing stairs' with recursion, why is memoization useful?

- a. To increase recursion depth
- b. To avoid repeated calculation of the same step count
- c. To change base cases
- d. To print the sequence

Question 10
Complete
Mark 0.00 out of 1.00

In the recursive construction of strobogrammatic numbers of length n, what is the base case when n=0?

- a. Return []
- b. Return ["0"]
- c. Return [""]
- d. Return None

Question 11
Complete
Mark 1.00 out of 1.00

The major drawback of recursion compared to iteration is:

- a. Memory usage due to call stack
- b. Ability to solve problems
- c. None
- d. Readability

Question 12
Complete
Mark 1.00 out of 1.00

What is a strobogrammatic number?

- a. Palindrome
- b. Prime
- c. Same when rotated 180 degrees
- d. Odd

Question 13
Complete
Mark 1.00 out of 1.00

What is the maximum recursion depth for the Euclidean GCD of two n-digit numbers?

- a. O(log n)
- b. O (1)
- c. O(n^2)
- d. O (n)

Question 14
Complete
Mark 1.00 out of 1.00

What happens if the order of arguments in gcd is swapped (gcd(a, b) vs gcd(b, a))?

- a. Result may change
- b. Sometimes same
- c. Result is always the same
- d. Only for even numbers

Question 15
Complete
Mark 1.00 out of 1.00

Is 116 a happy number?

- a. No
- b. Yes

Question 16
Complete
Mark 1.00 out of 1.00

What is the recursive step for generating n-length strobogrammatic numbers from n-2 length numbers?

- a. Insert pairs only at the beginning
- b. Concatenate "0" to the result
- c. None of these
- d. Add valid pairs to each side of every n-2 solution

Question 17
Complete
Mark 1.00 out of 1.00

Which of the following is not a characteristic of recursion?

- a. A function calls itself
- b. It always improves performance
- c. The problem size reduces with each call
- d. A stopping condition exists

Question 18
Complete
Mark 1.00 out of 1.00

What is the base case for GCD recursion using the Euclidean algorithm?

- a. When a == 0
- b. When a == 1
- c. When b == 0
- d. When a == b

Question 19
Complete
Mark 0.00 out of 1.00

What will be the output of climb(0) for the classic recursive climbing stairs function?

- a. Depends on implementation
- b. 0
- c. 1
- d. Error

Question 20
Complete
Mark 1.00 out of 1.00

What is a major risk in recursive string reversal in languages with immutable strings?

- a. None
- b. Faster execution
- c. Stack overflow for large strings
- d. Infinite loop

Question 21
Complete
Mark 1.00 out of 1.00

Which of the following is a base case in happy number recursion?

- a. n == 0
- b. n == 2
- c. n == 1
- d. n == 9

Question 22
Complete
Mark 1.00 out of 1.00

What is a risk of naive recursion for Fibonacci with large n?

- a. Redundant computation
- b. Neither a nor b
- c. Both a and b
- d. Stack overflow

Question 23
Complete
Mark 1.00 out of 1.00

What is the time complexity of the naive recursive Fibonacci function?

- a. O (log n)
- b. O (n)
- c. O (2^n)
- d. O (n^2)

Question 24
Complete
Mark 1.00 out of 1.00

If you reach the number 4 while checking for a happy number, what does it imply?

- a. The number is happy
- b. The sequence is in a loop (unhappy number)
- c. The number is prime
- d. The number is 4

Question 25
Complete
Mark 1.00 out of 1.00

Which recursion type is being used in this snippet?

```
public void f(int n) {
    if (n == 0) return;
    g(n - 1);
}
public void g(int n) {
    if (n == 0) return;
    f(n - 1);
}
```

- a. Head recursion
- b. Tail recursion
- c. Direct recursion
- d. Indirect recursion

Question 26
Complete
Mark 1.00 out of 1.00

What is the output of this function call: f(4)?

```
public void f(int n) {
    if (n == 0) return;
    f(n - 1);
    f(n - 1);
    System.out.println( n );
}
```

- a. Many repetitions of numbers
- b. No output
- c. Error
- d. 1 2 3 4

Question 27
Complete
Mark 1.00 out of 1.00

Which pairings are valid in constructing strobogrammatic numbers?

- a. (2,2), (5,5)
- b. (1,8), (8,1), (6,9)
- c. (6,9), (9,6), (1,1), (8,8), (0,0)
- d. (3,3), (7,7)

Question 28
Complete
Mark 0.00 out of 1.00

Which recursive approach can reduce the time complexity of Fibonacci to O (n)?

- a. Using global variable
- b. Memoization (caching)
- c. Printing in each call
- d. Tail recursion

Question 29
Complete
Mark 1.00 out of 1.00

Which digits are strobogrammatic in themselves?

- a. 1, 8, 0
- b. 2, 5
- c. 1, 6, 8, 9, 0
- d. 6, 9

Question 30
Complete
Mark 1.00 out of 1.00

What is the stopping condition for checking a happy number recursively?

- a. When the number is prime
- b. When the number equals 1 or loops forever
- c. When the number is negative
- d. When the number is even

Question 31
Complete
Mark 0.00 out of 1.00

What will be the result of gcd(270, 192) using recursion?

- a. 18
- b. 24
- c. 12
- d. 6

Question 32
Complete
Mark 1.00 out of 1.00

Which recurrence best models the 'climbing stairs' problem if you can climb 1 or 2 stairs at a time?

- a. f (n) = f(n-1) + f(n-2)
- b. f (n) = f(n-1) + 1
- c. f (n) = f(n-2) + 2
- d. f (n) = f(n-1)

Question 33

Complete

Mark 1.00 out of 1.00

Which recursion is the Euclidean algorithm an example of?

- a. Indirect recursion
- b. Tree recursion
- c. Tail recursion
- d. Head recursion

Question 34

Complete

Mark 1.00 out of 1.00

Which of the following CANNOT always be converted to iteration without extra data structures?

- a. Tail recursion
- b. Head recursion
- c. Linear recursion
- d. Tree recursion

Question 35

Complete

Mark 0.00 out of 1.00

How many distinct ways are there to climb 4 stairs (1 or 2 at a time)?

- a. 3
- b. 8
- c. 4
- d. 5