

Assessment Title :

Recursion

Number of Attempts :

1 out of unlimited

Duration :

12h 17m 6s

Start Time :

24-Nov-2016 12:38 AM

Total Marks :

6 out of 10

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1) Given the following recursive function:

```
int f(int n) {  
    if (n == 1) {  
        return 1;  
    } else if (n%2 == 1) {  
        return f(3*n+1) + 1;  
    } else {  
        return f(n/2) + 1;  
    }  
}
```

What is the output of the following program fragment?

```
printf("%d\n", f(3));
```

- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10

Correct Answer : 8

Your Marks : 1 out of 1

2) What is the output of the following program?

```
#include <stdio.h>

void f(int n);

int main(void) {
    f(29);
}

void f(int n) {
    if (n < 2) {
        printf("%d", n);
    } else {
        printf("%d", n%2);
        f(n/2);
    }
    return;
}
```

- ☐ 10011
- ☐ 10111
- ☐ 11001
- ☐ 11101

Correct Answer : 10111

Your Marks : 1 out of 1

3) What is the output of the following program?

```
#include <stdio.h>

void f(int n);

int main(void) {
    f(29);
}

void f(int n) {
    if (n < 2) {
        printf("%d", n);
    } else {
        f(n/2);
        printf("%d", n%2);
    }
    return;
}
```

- ☐ 10011
- ☐ 10111
- ☐ 11001
- ☐ 11101

Correct Answer : 11101

Your Marks : 0 out of 1

4) Given the following recursive function:

```
int f(int n) {
    if (n < 10) {
        return n;
    } else {
        return (n%10) + f(n/10);
    }
}
```

What is the output of the following program fragment?

```
int a, b, c;

a = f(111111111);
b = f(3123);
c = f(123453);
printf("%d %d %d\n", a, b, c);
```

- ☐ 1 3 1
- ☐ 9 9 9
- ☐ 11111111 312 12345
- ☐ 9 9 18

Correct Answer : 9 9 18

Your Marks : 0 out of 1

5) Given the following recursive function:

```
int f(int n) {  
    if (n < 10) {  
        return n;  
    } else {  
        return (n%10) + f(n/10);  
    }  
}
```

What is the number of recursive function calls in the following statement?

f(12345);

- ☐ 0
- ☐ 1
- ☐ 4
- ☐ 5

Correct Answer : 5

Your Marks : 0 out of 1

6) Study the following recursive function.

```
int f(int n) {  
    if (n <= 1) {  
        return n;  
    } else {  
        return f(n - 1) + n;  
    }  
}
```

Suppose $n \in \mathbb{Z}$, which formula corresponds to the value returned by the function?

- ☐ n
- ☐ n^2
- ☐ $\sum_{i=0}^{n-1} i$
- ☐ $\sum_{i=0}^n i$

Correct Answer :

$$\sum_{i=0}^n i$$

Your Marks : 1 out of 1

7) Study the following recursive function.

```
int f(int n) {
    if (n > 1) {
        return f(n - 1) + f(n - 1);
    } else {
        return 1;
    }
}
```

Suppose $n \in \mathbb{Z}^+$ (i.e. set of positive integers), which formula corresponds to the value returned by the function?

- ☐ $2(n - 1)$
- ☐ $2n$
- ☐ 2^{n-1}
- ☐ 2^n

Correct Answer : 2^{n-1}

Your Marks : 1 out of 1

8) Study the following recursive function.

```
int f(int n) {
    int x = 0;
    if (n > 0) {
        x = x + f(n - 1);
        x++;
        x = x + f(n - 1);
    }
    return x;
}
```

Suppose $n \in \mathbb{Z}$, which formula corresponds to the value returned by the function?

- ☐ $2n$
- ☐ $n^2 - 1$
- ☐ $2^n - 1$
- ☐ 2^n

Correct Answer : $2^n - 1$

Your Marks : 0 out of 1

9) Given the following recursive function:

```
int f(int n) {  
    int sum = 0;  
  
    while (n > 0) {  
        n = n - 1;  
        sum = sum + f(n);  
    }  
  
    return sum;  
}
```

Suppose $n \in \mathbb{Z}$, which of the following corresponds to the value returned by the function?

- ☐ 0
- ☐ n^2
- ☐ $2^n - 1$
- ☐ 2^n

Correct Answer :	0
Your Marks :	1 out of 1

10) Study the following program.

```

#include <stdio.h>

int x(int a);
int y(int b);

int main(void) {
    int val;

    scanf("%d", &val);
    printf("%d\n", x(val));
    return 0;
}

int x(int a) {
    if (a == 1 || a == -1) {
        return a;
    } else {
        if (a < 0) {
            return y(a+1) - a;
        } else {
            return y(a-1) - a;
        }
    }
}

int y(int b) {
    if (b == 1 || b == -1) {
        return b;
    } else {
        return x(b) + b;
    }
}

```

What is the output of the program when the input is 3?

- ☐ -3
- ☐ -2
- ☐ 2
- ☐ 3

Correct Answer : -2

Your Marks : 1 out of 1

 Close