

CSE 101 Midterm 2

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1. What is the output of the following program?

```
int x = 10;
while (x > 5){
    x--;
    System.out.println(x);
}
```

- a) 1098765
- b) 109876
- c) 98765
- d) 9876
- e) 987654

2. What is missing in the following code fragment?

```
int count = 0;
while (count <= 8){
    System.out.println("Hi");
}
```

- a) Setting the initial value of the loop variable
- b) Testing the value of the loop variable
- c) Increasing the value of the loop variable
- d) Decreasing the value of the loop variable
- e) None of the above

3. Which of the following codes print 5 times "Hello World" to the screen?

a)

```
for (int i = 1; i < 5; i++)
    System.out.println("Hello..World");
```

b)

```
for (int i = 0; i <= 6; i++)
    System.out.println(Hello World);
```

c)

```
for (int i = 1; i < 6; i++)
    System.out.println("Hello..World");
```

d)

```
for (int i = 1; i <=6; i++)
    System.out.println(Hello World);
```

e) None of the above

4. What will be the output of the following program?

```
int sum = 0;
for (int i = 0; i <= 20; i += 4){
    sum += i;
}
System.out.println(sum);
```

- a) 44
- b) 28
- c) 48
- d) 24
- e) 60

5. Let say you want to write a program which will take a positive number N as input from the user and prints the sum of integers until N . The following statements are given.

```
Scanner input;
System.out.println(sum);
input = new Scanner(System.in);
for (int i = 1; i <= N; i++)
int sum = 0;
int N = input.nextInt ();
sum = sum + i;
```

What is the correct order of statements if you want to accomplish this task?

- a) 1, 6, 5, 4, 2, 7, 3
- b) 5, 1, 3, 6, 4, 2, 7
- c) 2, 6, 4, 7, 5, 3, 1
- d) 4, 6, 2, 7, 5, 1, 3
- e) 1, 5, 3, 6, 4, 7, 2

6. Suppose your method returns the grade point average (GPA) of the students, which of the following keywords can be used as a return type?

- a) void
- b) int
- c) double
- d) boolean
- e) String

7. Which of the following code blocks is the same as the following code block?

```
for (int i = 5; i >= 0; i -= 2){
    System.out.println("2x" + i + "=" + i);
}
```

a)

```
System.out.println("2x5=10");
System.out.println("2x3=6");
System.out.println("2x1=2");
```

b)

```
System.out.println("2x5=10");
System.out.println("2x4=8");
System.out.println("2x3=6");
System.out.println("2x2=4");
System.out.println("2x0=0");
```

c)

```
System.out.println("2x5=10");
System.out.println("2x4=8");
System.out.println("2x3=6");
System.out.println("2x2=4");
System.out.println("2x1=2");
System.out.println("2x0=0");
```

d)

```
System.out.println("2x5=5");
System.out.println("2x3=3");
System.out.println("2x1=1");
```

e)

```
System.out.println("2x3=6");
System.out.println("2x2=4");
System.out.println("2x1=2");
```

8. Which of the following is not included in the function prototype?

- Name of the method
- List of the parameters
- Name of the parameters
- Return type of the method
- Contents of the method

9. Suppose you are given a method named **findSum** that reads numbers a, b, and c from the keyboard, and returns the sum of all numbers between [a, b] in increments of c. Which of the following is the correct header for **findSum** method?

- void** findSum(a,b,c)
- int** findSum(a,b,c)
- int** findSum()
- void** findSum()
- int** findSum(**int** a, **int** b, **int** c)

10. Suppose you are given method named **average** that calculates and returns the average of two double numbers. Which of the following is the correct statement to call the **average** method?

- double** result=average(x,y);
- int** result=average(**double** x, **double** y);
- double** result=average(**double** x, **double** y);
- int** result=average(x,y);
- double** result=average(**double** {x, y});

11. Consider the following for loop

```
for (; B; C){
}
```

How do you convert this for loop into a while loop?

a)

```
while (B){
}
C;
```

b)

```
B;
while (true){
    C;
}
```

c)

```
while (C){
    B;
}
```

d)

```
while (B){
    C;
}
```

e)

```
B;
while (C){
}
```

12. What will be the output of the following program?

```
int sum = 0;
for (int i = 10; i >= 1; i--){
    for (int j = 10; j >= i; j--){
        sum += 2;
    }
}
System.out.println(sum);
```

- 55
- 210
- 110
- 50
- 220

13. What will be the output of the following program?

```
int sum = 0;
for (int i = 1; i <= 5; i++){
    for (int j = 1; j <= 5; j++){
        for (int k = j; k <= 5; k++){
            sum++;
        }
    }
}
System.out.println(sum);
```

- a) 55
- b) 35
- c) 210
- d) 75
- e) 110

14. What will be the output of the following program?

```
for (int i = 0; i <= 2; i++){
    for (int j = 0; j <= 2; j++){
        System.out.print("*");
    }
    System.out.println ();
}
```

- a) ***
*

- b) *
**

- c) ***

- d) ***
**
*
- e) *****

15. What is the output of the following program?

```
int x = 4;
while (x < 10){
    x++;
    if (x > 8){
        break;
    }
    System.out.print(x);
}
```

- a) 456789
- b) 5678
- c) 56789
- d) 4567
- e) 45678

16. What will be the output of the following program?

```
public static void main(String[] args) {
    for (int i = 1; i <= 5; i++)
        printStar(i);
    for (int i = 5; i >= 1; i--)
        printStar(i);
}
public static void printStar(int n) {
    for (int i = 1; i <= n; i++)
        System.out.print("*");
    System.out.println ();
}
```

- a) *
**

**
*
b) *
**

**
*
c) *****

**
*
*
**

d) *****

**
*
e) *
**

17. What will be the output when we call the following function with the expression `nPrint("Ali", 4)`;

```
public static void nPrint(String message, int n) {
    for (int i = 1; i <= n; i = i + 2){
        System.out.print(message);
    }
}
```

- a) AliAli
- b) AliAliAli
- c) Ali
Ali
Ali
Ali
- d) Ali
Ali
- e) AliAliAliAli

18. Which of the following code fragments calculate the following sum:

$$\frac{1}{2^2} + \frac{1}{3^2} + \dots + \frac{1}{N^2}$$

a)

```
double sum = 0;
int i = 1;
while (i >= N){
    sum = sum + 1 / i^2;
    i++;
}
```

b)

```
double sum = 0;
for (int i = 2; i <= N; i++){
    sum = sum + 1.0 / i * i;
}
```

c)

```
double sum = 0;
int i = 1;
while (i <= N){
    sum = sum + 1.0 / (i * i);
}
```

d)

```
double sum = 0;
for (int i = 2; i <= N; i++){
    sum = sum + 1.0 / (i * i);
}
```

e)

```
int sum = 0;
int i = 1;
while (i <= N){
    sum = sum + 1 / i * i;
    i++;
}
```

19. Consider the following program:

```
public static void main(String[] args){
    Scanner s = new Scanner(System.in);
    double sum = 0;
    double num = s.nextDouble();
    for (int i = 1; i < 10; i++){
        sum += num / i;
    }
    System.out.println(sum);
}
```

How do you convert this program into a method?

a)

```
public static double f(int N){
    double sum = 0;
    for (int i = 1; i < 10; i++){
        sum += N / i;
    }
    System.out.println(sum);
}
```

b)

```
public static int f(int N){
    double sum = 0;
    N = s.nextDouble();
    for (int i = 1; i < 10; i++){
        sum += N / i;
    }
    return sum;
}
```

c)

```
public static double f(int N){
    double sum = 0;
    for (int i = 1; i < 10; i++){
        sum += N / i;
    }
    return sum;
}
```

d)

```
public static void f(){
    double sum = 0;
    for (int i = 1; i < 10; i++){
        sum += N / i;
    }
    return sum;
}
```

e)

```
public static void f(){
    double sum = 0;
    N = s.nextDouble();
    for (int i = 1; i < 10; i++){
        sum += N / i;
    }
    System.out.println(sum);
}
```

20. Let say you have the following function defined:

```
public static void printStar(int n){
    for (int i = 1; i <= n; i++){
        System.out.print("*");
    }
    System.out.println ();
}
```

Which of the following code fragments produce the following output?

```
***
**
*
**
***
```

a)

```
printStar (3);
printStar (2);
printStar (1);
printStar (2);
printStar (3);
```

b)

```
printStar (1);
printStar (2);
printStar (3);
printStar (2);
printStar (1);
```

c)

```
printStar (4);
printStar (3);
printStar (2);
printStar (1);
printStar (2);
```

d)

```
printStar (11);
```

e)

```
printStar (3, 3);
```

21. Let say you have the functions factorial and power

```
public static int factorial (int N)
public static int power(int x, int y)
```

which calculate $N!$ and x^y respectively. Which of the following code fragments then calculate the following sum:

$$\frac{1!}{2^0} + \frac{2!}{2^1} + \dots + \frac{(N+1)!}{2^N}$$

a)

```
double sum = factorial(N+1) / power(2, N);
```

b)

```
double sum = 1;
for (int i = 1; i <= N; i++){
    sum += (factorial (i) + 0.0) / power(2, N);
}
```

c)

```
double sum = 0;
for (int i = 1; i <= N; i++){
    sum += (factorial (N+1) + 0.0) / power(2, i);
}
```

d)

```
double sum = 0;
for (int i = 0; i <= N; i++){
    sum += factorial (i+1) / power(2, i);
}
```

e)

```
double sum = 0;
for (int i = 1; i <= N; i++){
    sum += (factorial (i) + 0.0) / power(2, i+1);
}
```

22. Let say you have the function factorial

```
public static int factorial (int N)
```

which calculates $N!$. Which of the following code fragments then calculate the following:

$$P = \frac{N!}{(N - M)!}$$

a)

```
P = factorial (N, M);
```

b)

```
double P = 0;
for (int i = 1; i <= N; i++){
    P += factorial (N, M);
}
```

c)

```
P = factorial (N) / factorial (N - M);
```

d)

```
double P = 0;
for (int i = 1; i <= N; i++){
    P += factorial (N - M, i);
}
```

e)

```
double P = 0;
for (int i = 1; i <= M; i++){
    P += factorial (N, i);
}
```

23. Let say you have the function triangleSum

```
public static int triangleSum(int n)
```

which calculates the sum of all integers from 1 to n

$$1 + 2 + \dots + n = \frac{n(n+1)}{2}$$

The sum of cubes of all integers from 1 to n can be calculated as

$$cubes(n) = 1^3 + 2^3 + \dots + n^3 = \left(\frac{n(n+1)}{2}\right)^2$$

Which of the following functions calculates the sum of cubes of all integers from 1 to n ?

a)

```
public static int cubes(int n){
    return triangleSum(n);
}
```

b)

```
public static int cubes(int n){
    return triangleSum(n) * triangleSum(n);
}
```

c)

```
public static int cubes(int n){
    int sum = 0;
    for (int i = 1; i <= n; i++){
        sum += triangleSum(i);
    }
    return sum;
}
```

d)

```
public static int cubes(int n){
    int sum = 0;
    for (int i = 1; i <= n; i++){
        sum += triangleSum(i) * triangleSum(i);
    }
    return sum;
}
```

e)

```
public static int cubes(int n){
    int sum = 0;
    for (int i = 1; i <= n; i++){
        sum += triangleSum(i) * triangleSum(i)
            * triangleSum(i);
    }
    return sum;
}
```

24. Let say you have the function isEven

```
public static boolean isEven(int N)
```

which returns **true** if N is even, **false** otherwise. Which of the following code fragments prints all positive even numbers less than 10?

a)

```
System.out.println(isEven(10));
```

b)

```
for (int i = 2; i < 10; i++){
    System.out.println(isEven(i));
}
```

c)

```
for (int i = 2; i < 10; i++){
    if (isEven(i)){
        System.out.println(i);
    }
}
```

d)

```
for (int i = 2; i < 10; i++){
    System.out.println(i);
}
```

e)

```
isEven(10);
```

25. Consider the following while loop

```
A;
while (B){
}
```

How do you convert this while loop into a for loop?

a)

```
for (A; B; ){
}
```

b)

```
for (A; B; ){
    B;
}
```

c)

```
A;
for (A; B; ){
}
```

d)

```
for (A; B;){
}
```

e)

```
A;
for (B; ; ){
}
```