

1. Study the algorithm below and answer the following questions:

```
static void print(int n) {  
    if (n > 5) {  
        return;  
    }  
    System.out.println(n);  
    print(n + 1);  
}
```

- a. Describe the above function. (2 marks)
 - b. Print the output for the above function. (1 mark)
 - c. Discuss what `if (n > 5) return` is doing. (2 marks)
2. What is the factorial of a number (`n`)? (2 marks)
- a. Give 4, find the `4!` using the formula: `n! = n * (n- 1)!`. (2 marks)
 - b. List a difference between a parameter and an argument. (1 mark)
3. Discuss Big O Notation. (1 mark)
- a. Distinguish between time and space complexity. (2 marks)
 - b. Using the algorithm:
- ```
int[] arr = {10, 20, 30, 40};
for (int num : arr) {
 System.out.println(num);
}
```
- determine its time complexity. (2 marks).
4. List the differences between a class and an object. (1 marks)
- a. List all the principles of Object Oriented Programming. (2 marks)
  - b. List any three types of classes in Java. (1 mark)
  - c. Discuss between method-overloading and method-overriding. (1 mark)
5. What are the two types of memory allocation/management in Java? (1 mark)
- a. List a difference between a compile and a run time. (1 mark)
  - b. List the two main types of data structures in Java. (1 mark)
  - c. List two differences between a stack and a queue. (2 mark)