SECTION 1

1:Explain the differences between primitive and reference data types.

Primitive types store the actual value directly in memory, which results in high memory efficiency and faster access speed. On the other hand, reference types store memory addresses that point to complex objects or data structures stored elsewhere in memory.

2:Define the scope of a variable (hint: local and global variable).

Scope is just a technical term for the parts of your code that have access to a variable. Local variables are variables that are declared within a specific scope, such as within a function or a block of code. Global variables are variables that are declared outside of any function or block of code and can be accessed from any part of the program.

3:Why is initialization of variables required?
Initialization is needed to allocate memory and assign a default or intended value to a variable. It prevents accessing unassigned memory, which could lead to unpredictable behavior.

4:Differentiate between static, instance, and local variables
Static variables are declared using the static keyword and belong to the class itself, not to any instance of the class. They are shared among all instances of the class.
Instance variables are declared within a class but outside any method. Each instance of the class has its own copy of these variables.
Local variables are variables that are declared within a specific scope, such as within a function or a block of code.

5:Differentiate between widening and narrowing casting in Java

Widening is a process by which a lower data type is transformed into a higher one.

Narrowing casting is a process of downsizing a bigger data type into a smaller one.

TYPE	SIZE (IN BYTES)	DEFAULT	RANGE
boolean	1 bit		true, false
Char	2	0	'\0000' to '\ffff'
Byte	1	0	-128 to 127
Short	2	0	-215 to +215-1
Int	4	0	-2^31 to 2^31-1
Long	8	0L	- 2^{63} to $2^{63}-1$
Float	4	00.0f	$\pm 1.4 \times 10^{-45}$ to $\pm 3.4 \times 10^{38}$
Double	8	0.0	-1.8E+308 to +1.8E+308

6:A class is a blueprint for creating objects, providing initial values for state and implementations of behavior.

7:Classes help you take all the properties and behaviors of an object in your program, and combine them into a single template.