**Java programming**

**Section 1:**

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

* Primitive data types store the actual value directly in the memory which results in high memory efficiency and faster access speed while the reference data types are ones which store memory addresses that point to complex objects stored elsewhere in memory

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

* Scope of the variable is the region of the code within which the variable is accessible
* Local variable is a variable which is accessible only within the scope of the method
* Global variable is a variable in which is tied to a specific instance of a class

1. **Why is initialization of variables required.**

* Initialization of a variable is required to prevent unintended errors during the course of writing and running the application

1. **Differentiate between static, instance and local variables.**

* Static variables are used for sharing data across all instances of a class, instance variables are used for attributes specific to each object of a class, local variables are used for temporary storage within methods

1. **Differentiate between widening and narrowing casting in java.**

* Widening casting involves the converting of a smaller data type to a larger data type while narrowing casting involves the converting of a larger data type to a smaller data type
* In widening casting no data is lost while in narrowing casting data is lost

1. the following table shows data type, its size, default value and the range. Filling in the missing values.

|  |  |  |  |
| --- | --- | --- | --- |
| **TYPE** | **SIZE (IN BYTES)** | **DEFAULT** | **RANGE** |
| boolean | 1 bit | False | true, false |
| Char | 2 | ‘\u0000’ | ‘\0000’ to ‘\ffff’ |
| Byte | 1 | 0 | -128 to 127 |
| Short | 2 | 0 | -215 to +215-1 |
| Int | 4 | 0 | -2,147,483,648 to 2147,483,647 |
| Long | 8 | 0L | - 9,223,372,036,854,775,808 to 9,223,372,036,854,775,807 |
| Float | 4 | 00.0f | 3.4028235E+38 to 1.4E-45 |
| Double | 8 | 0.0 | -1.8E+308 to +1.8E+308 |

1. **Define class as used in OOP**

A class in OOP is a user defined data structure that represents a real world entity by encapsulating data and behavior in a single unit

1. **Explain the importance of classes in Java programming.**

* Classes provide the template for creating objects which can bind code into data
* Reusability – which is the use of the existing classes in order to create a new class without the modifying of the new code
* Enables the code to be more flexible based on the object in which they are acting upon
* Enables the breaking down of the program into separate classes
* It has enabled the inheriting of classes from one class to another