1.

a) List four legal identifier names.

1. `studentName`
2. `age1`
3. `_score`
4. `$total`

b) List four illegal identifier names and explain why each is illegal.

- `1name` → Illegal because identifiers cannot start with a digit.
- `class` → Illegal because it's a reserved keyword in Java.
- `student-name` → Illegal because hyphen (`-`) is not allowed.
- `total amount` → Illegal because spaces are not allowed in identifiers.

2.

a) In two statements, declare a variable named numBeads and assign it the value 5.

```
int numBeads;
numBeads = 5;
```

b) In one statement, declare a variable named numBeads and assign it the value 5.

```
int numBeads = 5;
```

3.

a) What is the final value of yourNumber after the last statement executes? int myNumber = 5; int yourNumber = 4; myNumber = yourNumber * 2; yourNumber = myNumber + 5;

```
int myNumber = 5;
int yourNumber = 4;
myNumber = yourNumber * 2;   // myNumber = 8
```

yourNumber = myNumber + 5; // yourNumber = 13

Final number = 13

b) What is the final value of yourNumber after the last statement executes? int myNumber; int yourNumber = 4; myNumber = yourNumber + 7; yourNumber = myNumber;

```
int myNumber;
int yourNumber = 4;
myNumber = yourNumber + 7;   // myNumber = 11
yourNumber = myNumber;       // yourNumber = 11
```

Final number = 11

4. Determine the appropriate data type for each of the following values:

a) Number of basketballs in a department store → `int`
b) Price of a basketball → `double`
c) Number of players on a basketball team → `int`
d) Average age of the players on a basketball team → `double`
e) Whether a basketball player has received a jersey or not → `boolean`
f) First initial of a basketball player's first name → `char`

5. a) What is the difference between a primitive data type and an abstract data type? b) What is the difference between a class and an object?

5. Conceptual Differences

a) Primitive vs Abstract Data Type:

- Primitive data type: Built-in, simple data types such as `int`, `double`, `boolean`, `char`. They hold a single value and are not objects.

- Abstract (Reference) data type: More complex, created from classes (like `String`, `ArrayList`). They store references to objects in memory, not the actual value.

b) Class vs Object:

- Class: A blueprint or template that defines properties (fields) and behaviors (methods). Example: `Car` class.

- Object: An instance of a class, created in memory. Example: `Car myCar = new Car();`