**Assignment -> Chapter 1**

**1.1**

a. Programs.

b. Input unit, Output unit, Storage unit, Arithmetic and Logic Unit and control unit.

c. Machine language, assembly language and High-level language.

d. Compilers.

e. Android

f. Beta

g. Accelerometer

**1.2**

a) java

b) javac

c) .java

d) .class

e) bytecodes

**1.3**

a) Encapsulation

b) Classes

c) Object-oriented design (OOD)

d) Inheritance

e) UML (Unified Modeling Language)

f) Attributes

**1.4**

a) input unit

b) programming

c) assembly language

d) output unit

e) memory, storage unit

f) arithmetic and logic unit (ALU)

g) control unit

h) high-level languages

i) machine language

j) control unit

**1.5**

a) Java

b) C

c) Transmission Control Protocol (TCP)

d) C++

**1.6 a) Edit, compile, load, verify, execute**

b) Integrated Development Environment (IDE)

c) Java Virtual Machine (JVM)

d) Hypervisor

e) Class loader

f) Bytecode verifier

**1.7 The two compilation phases of Java programs are:**

* Phase 1: **Source Code Compilation** – In this phase, the Java compiler translates the .java file (source code) into a bytecode file with a .class extension.
* Phase 2: **Bytecode Execution** – The JVM (Java Virtual Machine) reads the .class file, converts the bytecode into machine code (using the Just-In-Time compiler), and then executes the program.

**1.8 Applying concepts to a wristwatch:**

* **Object**: The watch itself as an entity.
* **Attributes**: The color, brand, size, and material of the watch.
* **Behaviors**: Telling time, setting an alarm, stopwatch functionality.
* **Class**: A blueprint for watches, defining common attributes and behaviors.
* **Inheritance**: An alarm clock inherits traits of a standard watch, adding alarm-related features.
* **Modeling**: Representing watches and their behaviors in code or UML diagrams.
* **Messages**: Communication between parts of the watch or its features.
* **Encapsulation**: Hiding the internal workings (gears and mechanisms) of the watch from the user.
* **Interface**: The user-facing parts of the watch, like the display and buttons.
* **Information Hiding**: Ensuring the intricate workings are not exposed but still functioning flawlessly.

**1.9 Formulas for calculating Carbon footprints:**

* **For energy consumption:** Carbon footprint = Energy consumption (kWh) × Emission factor (kg CO₂e per kWh)
* **For transportation (vehicles):** Carbon footprint = Distance traveled (km or miles) × Fuel efficiency (liters/km or miles) × Emission factor (kg CO₂e per liter of fuel)
* **For air travel:** Carbon footprint = Distance traveled (km) × Emission factor (kg CO₂e per km for the type of flight)

**1.10 Formulas for calculating Body mass Index – BMI:**

BMI = weight (kg) / [height (m)]²

Where:

* Weight is measured in kilograms (kg).
* Height is measured in meters (m).

**1.11 Hybrid vehicles and Attributes:**

* **Toyota Prius**
* Hybrid Synergy Drive system
* Combined fuel efficiency up to 57 MPG
* EV mode for electric-only operation
* Regenerative braking system
* Available all-wheel drive
* Spacious interior design
* Advanced safety features with Toyota Safety Sense
* **Honda Accord Hybrid**
* 2.0L Atkinson-cycle engine
* Combined fuel efficiency of 48 MPG
* E-CVT transmission for smooth performance
* Large touchscreen with smartphone integration
* Dual electric motor system
* Generous trunk space
* Adaptive cruise control
* **Hyundai Sonata Hybrid**
* 2.0L GDI Hybrid engine
* Solar roof panel for extra charging
* Combined fuel efficiency of 47 MPG
* Panoramic sunroof option
* Quiet cabin with premium materials
* Remote Smart Parking Assist
* Wireless phone charging
* **Toyota RAV4 Hybrid**
* 2.5L engine paired with electric motors
* Electronic On-Demand AWD
* Up to 41 MPG city fuel efficiency
* Multiple drive modes (Eco, Sport, EV, etc.)
* Spacious cargo area
* High towing capacity
* Advanced infotainment system
* **Jeep Grand Cherokee 4xe**
* Plug-in hybrid with 2.0L turbocharged engine
* Electric-only range of up to 25 miles
* Combined efficiency of 56 MPG
* Legendary off-road capability with 4x4 system
* Premium interior finishes
* Tow rating up to 6,000 pounds
* Advanced hybrid mode selector

**1.12 Gender neutrality**

public class GenderNeutralizerSimple {

public static void main(String[] args) {

// Sample text

String text = "My husband and wife have a son and daughter.";

// Gendered words and their replacements (using arrays)

String[] genderedWords = {"husband", "wife", "son", "daughter", "man", "woman"};

String[] neutralWords = {"spouse", "spouse", "child", "child", "person", "person"};

// Replace words manually

for (int i = 0; i < genderedWords.length; i++) {

text = text.replace(genderedWords[i], neutralWords[i]);

}

// Print result

System.out.println("Modified Text: " + text);

}

}