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|  | ***Patuakhali Science and Technology University*** |

Assignment on

***“*Solve exercise*”***

Course Code: CCE-121

Course Title: Object Oriented Programming

Level - I; Semester - II

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**2. Solve also below exercise**

Section: 1.2

▼1.2.1

What are hardware and software?

Ans: Hardware refers to the physical components of a computer (CPU, RAM, hard drive). Software refers to the programs and instructions that run on the hardware (operating systems, applications).

▼1.2.2

List five major hardware components of a computer.

Ans:

1. CPU (Central Processing Unit)

2. RAM (Random Access Memory)

3. Hard Drive / SSD (Storage)

4. Motherboard

5. Power Supply

▼1.2.3

What does the acronym CPU stand for? What unit is used to measure CPU speed?

Ans: CPU stands for Central Processing Unit. Its speed is measured in Hertz (Hz), commonly GHz (Gigahertz).

▼1.2.4

What is a bit? What is a byte?

Ans: A bit (binary digit) is the smallest unit of data (0 or 1). A byte consists of 8 bits.

▼1.2.5

What is memory for? What does RAM stand for? Why is memory called RAM?

Ans: Memory stores data and instructions temporarily for quick access by the CPU. RAM stands for Random Access Memory. It is called RAM because data can be accessed randomly (not sequentially).

▼1.2.6

What unit is used to measure memory size? What unit is used to measure disk size?

Ans: Memory size is measured in bytes (KB, MB, GB). Disk size is also measured in bytes but typically in larger units (TB, PB).

▼1.2.7

What is the primary difference between memory and a storage device?

Ans: Memory (RAM) is volatile (loses data when power is off) and fast, used for temporary storage. Storage devices (HDD/SSD) are non-volatile (retain data) and slower, used for long-term storage.

Section: 1.3

▼1.3.1

What language does the CPU understand?

Ans: The CPU understands machine language (binary code).

▼1.3.2

What is an assembly language? What is an assembler?

Ans: Assembly language is a low-level programming language using mnemonics. An assembler converts assembly code into machine code.

▼1.3.3

What is a high-level programming language? What is a source program?

Ans: A high-level programming language is user-friendly (Java, Python). A source program is the original code written by a programmer.

▼1.3.4

What is an interpreter? What is a compiler?

Ans: An interpreter executes code line by line. A compiler translates the entire program into machine code before execution.

▼1.3.5

What is the difference between an interpreted language and a compiled language?

Ans: Interpreted languages execute code directly (Python). Compiled languages convert code to machine language before execution (C++).

Section: 1.4

▼1.4.1

What is an operating system? List some popular operating systems.

Ans: An OS manages hardware and software resources. Examples: Windows, macOS, Linux, Android.

▼1.4.2

What are the major responsibilities of an operating system?

Ans: Memory management, process scheduling, file management, security, and hardware communication.

▼1.4.3

What are multiprogramming, multithreading, and multiprocessing?

Ans:

- Multiprogramming: Running multiple programs concurrently.

- Multithreading: Executing multiple threads within a process.

- Multiprocessing: Using multiple CPUs for parallel processing.

Section: 1.5

▼1.5.1

Who invented Java? Which company owns Java now?

Ans: James Gosling invented Java. Oracle Corporation owns Java now.

▼1.5.2

What is a Java applet?

Ans: A Java applet is a small program that runs in a web browser (now mostly deprecated).

▼1.5.3

What programming language does Android use?

Ans: Android primarily uses Java and Kotlin.

Section: 1.6

▼1.6.1

What is the Java language specification?

Ans: A technical document defining Java's syntax and semantics.

▼1.6.2

What does JDK stand for? What does JRE stand for?

Ans: JDK = Java Development Kit. JRE = Java Runtime Environment.

▼1.6.3

What does IDE stand for?

Ans: Integrated Development Environment (Eclipse, NetBeans).

▼1.6.4

Are tools like NetBeans and Eclipse different languages from Java, or are they dialects or extensions of Java?

Ans: They are IDEs, not languages or dialects they assist in Java development.

Section: 1.7

▼1.7.1

What is a keyword? List some Java keywords.

Ans: Keywords are reserved words with special meaning (‘public’, ‘class’, ‘static’, ‘void’).

▼1.7.2

Is Java case sensitive? What is the case for Java keywords?

Ans: Yes, Java is case-sensitive. Keywords are in lowercase (‘public’, ‘int’).

▼1.7.3

What is a comment? Is the comment ignored by the compiler? How do you denote a comment line and a comment paragraph?

Ans: Comments are non-executable notes. The compiler ignores them.

- Single-line: ‘// comment’

- Multi-line: ‘/\* comment \*/’

▼1.7.4

What is the statement to display a string on the console?

Ans: ‘System.out.println("Your string");’.

▼1.7.5

Show the output of the following code:

public class Test {

public static void main(String[] args) {

System.out.println("3.5 \* 4 / 2 - 2.5 is ");

System.out.println(3.5 \* 4 / 2 - 2.5);

}

}

Ans:

3.5 \* 4 / 2 - 2.5 is

4.5

Section: 1.8

▼1.8.1

What is the Java source filename extension, and what is the Java bytecode filename extension?

Ans: Source file: ‘.java’, Bytecode: ‘.class’.

▼1.8.2

What are the input and output of a Java compiler?

Ans:

Input: ‘.java’ file.

Output: ‘.class’ (bytecode) file.

▼1.8.3

What is the command to compile a Java program?

Ans: javac Filename.java.

▼1.8.4

What is the command to run a Java program?

Ans: java ClassName.

▼1.8.5

What is the JVM?

Ans: JVM (Java Virtual Machine) executes Java bytecode.

▼1.8.6

Can Java run on any machine? What is needed to run Java on a computer?

Ans: Yes (platform-independent). Requires JRE installed.

▼1.8.7

If a NoClassDefFoundError occurs when you run a program, what is the cause of the error?

Ans: The JVM cannot find the `.class` file (e.g., wrong path or missing file).

▼1.8.8

If a NoSuchMethodError occurs when you run a program, what is the cause of the error?

Ans: The program calls a method that doesn’t exist (e.g., incorrect version).

Section: 1.9

▼1.9.1

Reformat the following program according to the programming style and documentation guidelines. Use the end-of-line brace style.

public class Test {

// Main method

public static void main(String[] args) {

/\*\* Display output \*/

System.out.println("Welcome to Java");

}

}

Section: 1.10

▼1.10.1

What are syntax errors (compile errors), runtime errors, and logic errors?

Ans:

- Syntax: Violations of language rules (caught at compile time).

- Runtime: Errors during execution (division by zero).

- Logic: Incorrect program behavior (wrong formula).

▼1.10.2

Give examples of syntax errors, runtime errors, and logic errors.

Ans:

- Syntax: Missing semicolon ‘;’.

- Runtime: Accessing an out-of-bounds array index.

- Logic: Using ‘+’ instead of ‘\*’ in a calculation.

▼1.10.3

If you forget to put a closing quotation mark on a string, what kind error will be raised?

Ans: Syntax error.

▼1.10.4

If your program needs to read integers, but the user entered strings, an error would occur when running this program. What kind of error is this?

Ans: Runtime error (InputMismatchException).

▼1.10.5

Suppose you write a program for computing the perimeter of a rectangle and you mistakenly write your program so that it computes the area of a rectangle. What kind of error is this?

Ans: Logic error.

▼1.10.6

Identify and fix the errors in the following code:

public class Welcome {

public static void main(String[] args) {

System.out.println("Welcome to Java!");

}

}

Corrections:

- Fixed ‘Main’ to ‘main’ (case-sensitive).

- Fixed ‘ ' ’ to ’ " ’ (string delimiter).

- Removed extra ‘ )’ at the end.