

**FINAL EXAMINATION**

**BACHELOR OF INFORMATION TECHNOLOGY (HONOURS) IN COMPUTER
APPLICATION DEVELOPMENT**
BACHELOR OF INFORMATION TECHNOLOGY (HONOURS) IN CYBER SECURITY
BACHELOR OF INFORMATION TECHNOLOGY (HONOURS) IN DATA ANALYTICS

COURSE	: PROGRAMMING FUNDAMENTALS
COURSE CODE	: SWC2493
DURATION	: 3 HOURS

INSTRUCTIONS TO CANDIDATES :

1. This question paper consists of **TWO (2)** main questions. : PART A (30 questions)
: PART B (4 questions)
2. Answer ALL questions in the Answer Booklet provided.
3. Please check to make sure that this examination pack consists of :
 - i. The Question Paper
 - ii. An Answer Booklet
4. Do not bring any material into the examination hall. Electronic calculator is allowed.
5. Please write your answer using permanent ink.

MYKAD/ PASSPORT NO. : _____
ID. NO. : _____
LECTURER : _____
SECTION : _____

DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO

This question paper consists of 13 printed pages including the front page

CONFIDENTIAL

PART A: MULTIPLE CHOICES QUESTIONS

Instruction: Choose the **CORRECT** answer.

1. Which option is the **BEST** *Keep It Simple and Straightforward (KISS)* compliant solution for calculating total price with discount?
 - A. `total = (price * quantity) - (price * quantity * discountRate)`
 - B. `temp = price * quantity; total = temp - (temp * discountRate)`
 - C. `total = ((price * quantity) * (1 - discountRate)) + 0`
 - D. `total = complexFormula(price, quantity, discountRate, tax, serviceFee)`

2. Which loop is guaranteed to execute its body at least once, regardless of the condition?
 - A. `for`
 - B. `while`
 - C. `do-while`
 - D. `if else`

3. Which pairing is **INCORRECT**?
 - A. Low-level language → Assembler
 - B. JRE → Converts .java to .class
 - C. Java → Platform independent via JVM
 - D. High-level language → Compiler/Interpreter

4. A junior developer uses very short variable names (`tm1`, `x2`) and nested conditions for a simple calculation. Which combination of principles is most relevant to improve the code quality?
 - A. *Don't Repeat Yourself (DRY)* only
 - B. *Single Responsibility Principle (SRP)* only
 - C. *Keep It Simple and Straightforward (KISS)* and *SRP*
 - D. *DRY* and *KISS*

5. Which scenario most clearly demonstrates *Don't Repeat Yourself (DRY)* without violating *Keep It Simple and Straightforward (KISS)*?
- A. Interpreted languages are always faster than compiled
 - B. Compiled languages detect errors during execution only
 - C. Interpreted languages produce an executable file before running
 - D. Compiled languages translate the whole program before running
6. Which situation **BEST** shows correct application of *Single Responsibility Principle (SRP)*?
- A. One function only validates user input
 - B. One function manages UI, logic, and storage
 - C. One function calculates marks and prints results
 - D. One function handles login, validation, and database update
7. A program repeats the same price calculation logic for Item A, B, and C. Which **TWO (2)** techniques together most directly support the *Don't Repeat Yourself (DRY)* principle?
- A. Loops and variables
 - B. Functions and arrays
 - C. If-else and constants
 - D. Printing and input statements
8. A developer chooses Assembly language to build a modern mobile e-wallet app. Which statement best explains why this is a poor design decision?
- A. Assembly does not support loops
 - B. Assembly cannot access databases
 - C. Assembly cannot perform calculations
 - D. Assembly is hardware-dependent and harder to maintain for modern apps
9. Which situation **MOST** clearly violates KISS but does **NOT** violate DRY?
- A. Same calculation copied into five places
 - B. One simple function reused everywhere
 - C. One function with a clear name and simple logic
 - D. One complex formula used everywhere in the program

10. Which characteristic **CORRECTLY** matches a Low-Level language?
- A. Easier to learn and use
 - B. Hardware-independent
 - C. Designed mainly for AI applications
 - D. Uses binary or mnemonics and is hardware-dependent
11. A company wants to build an AI-based chatbot and data analysis system quickly. Which language choice **BEST** fits modern programming languages?
- A. COBOL
 - B. Python
 - C. Assembly
 - D. Machine language
12. A system that directly uses binary instructions will **MOST** likely be classified as:
- A. High-level language
 - B. 5th generation language
 - C. Object-oriented language
 - D. Low-level language (machine language)
13. A developer uses one complex formula everywhere in a system to calculate discounts. The logic is reused but difficult to understand. Which statement is **MOST** accurate?
- A. *DRY* is applied, *KISS* is violated
 - B. *SRP* is applied, *DRY* is violated
 - C. *KISS* is applied, *SRP* is violated
 - D. *DRY* and *SRP* are both violated
14. Which of the following practices does **NOT** follow the *Keep It Simple and Straightforward (KISS)* principle?
- A. Writing short and clear logic for calculations
 - B. Using simple structures first such as `if-else` and loops
 - C. Using clear variable names such as `totalMarks` instead of `tm1`
 - D. Using advanced design patterns and complex algorithms for simple problems

15. Which component of the **JDK** is responsible for converting *.java* files into *.class* files?
- A. JVM
 - B. JRE
 - C. java (launcher)
 - D. javac (compiler)
16. The main method header is written as:
- A. `public static void main(string[] args)`
 - B. `public static void Main(String[] args)`
 - C. `public static void main(String[] args)`
 - D. `public static main(String[] args)`
17. Which **IDE** feature allows you to pause execution and inspect variable values line-by-line?
- A. Compiler
 - B. Debugger
 - C. Code editor
 - D. Auto-complete
18. Which pairing of **IDE** and typical usage is **CORRECT**?
- A. BlueJ → Large enterprise systems
 - B. Eclipse → Learning basic OOP only
 - C. IntelliJ IDEA → Only for beginners
 - D. NetBeans → Education and industry, including GUI apps
19. A student writes a Java class but the file name does **NOT** match the class name. What is the **MOST** likely result?
- A. The compiler produces an error
 - B. The debugger fixes it automatically
 - C. The program compiles and runs normally
 - D. The program runs but produces wrong output

20. Which code design practice **BEST** demonstrates encapsulation?

- A. Declaring all variables as public
- B. Using global variables for all data
- C. Writing all logic in the main method
- D. Making attributes private and accessing them using getters/setters

21. What is the output of this code?

```
System.out.println(2 + 3 * 4 == 14);
```

- A. 14
- B. true
- C. false
- D. Compilation error

22. What is the output of the following code?

```
int age = 30;  
int marks = 50;  
System.out.println((age >= 20) && (marks >= 55));
```

- A. 20.
- B. true
- C. false
- D. 50

23. Which of the following correctly represents the **PROCESS** in the **IPO** model for a program that calculates the total bill from price and quantity?

- A. Price and quantity
- B. Display the total bill
- C. Total amount to be paid
- D. Multiply price by quantity

24. Which of the following is most appropriate to represent an algorithm during the problem-analysis and design stage, before any code is written?
- A. Pseudocode
 - B. Java source code
 - C. Database schema
 - D. Compiled program output
25. Which statement violates the unambiguous property of an algorithm?
- A. "If mark $\geq$ 50, display 'Pass'."
 - B. "Set total = price $\times$ quantity."
 - C. "Process the data appropriately."
 - D. "Repeat steps 2 to 5 exactly three times."
26. Which variable name is **VALID** in Java?
- A. student name
 - B. 2number
 - C. _totalMarks
 - D. total-marks
27. What will be the output of the following code?
- ```
int x = 11;
System.out.println(x % 3);
```
- A. 1
  - B. 2
  - C. 3
  - D. 0

28. What will be the output of the following code?

```
double num = 9.75;
int result = (int) num;
System.out.println(result);
```

- A. 9
  - B. 10
  - C. 9.75
  - D. Compilation error
29. Which option correctly describes when errors are detected in compiled vs interpreted languages?
- A. Both detect all errors only at runtime
  - B. Interpreted languages produce an executable file before running
  - C. Compiled languages detect errors during execution, interpreted before running
  - D. Compiled languages detect errors before running; interpreted languages during running
30. Which statement about Java syntax rules is **TRUE**?
- A. Java is not case-sensitive
  - B. Keywords may contain spaces
  - C. File name must match the class name
  - D. Statements do not require semicolons

(TOTAL: 30 MARKS)



## PART B: STRUCTURED QUESTIONS

## QUESTION 1

- a. Define what an algorithm is.  
(1 mark)
- b. State and briefly explain any **THREE (3)** characteristics of a good algorithm.  
(6 marks)
- c. An online food delivery system calculates the final amount a customer needs to pay based on the order amount and delivery charge. The user is required to enter the order amount (in RM) and member status. If the order amount is RM50 or more, the delivery charge is free RM0. otherwise, a delivery charge of RM5 is applied. the program should display the final amount to be paid.

Write the pseudocode.

(8 marks)

(Total: 15 marks)

## QUESTION 2

- a. State **TWO (2)** Java syntax rules.  
(2 marks)
- b. Explain what a variable is and state **TWO (2)** naming rules for variables in Java.  
(3 marks)
- c. Write a Java program that uses dialog-based input and output (*JOptionPane*) to calculate the final price of an item after a discount. The program should prompt the user to enter the price of the item and the discount percentage. It should then calculate the final price and display the final price to the user in a dialog box.

(10 marks)

(Total: 15 marks)

## QUESTION 3

- a. State **TWO (2)** purposes of using an *if* statement inside a loop with an example for each purpose.

(4 marks)

- b. Define selection control structure in Java.

(2 marks)

- c. Given the following Java program.

```
public class AnalyseOutput
{
 public static void main(String[] args)
 {
 int i;
 int total = 0;

 for (i = 1; i <= 5; i++)
 {
 if (i % 2 == 0)
 {
 total = total + i;
 System.out.println("Added: " + i);
 }
 else
 {
 System.out.println("Skipped: " + i);
 }
 }

 System.out.println("Total = " + total);
 }
}
```

- i) Identify the control structures used in the code above and write the output produced by the program.

(8 marks)

- ii) State the final value of total and briefly explain how it is obtained.

(6 marks)

(Total: 20 marks)

## QUESTION 4

- a. What is array indexing and bounds?  
(2 marks)
- b. State **TWO (2)** common operations that can be performed on arrays and explain each operation.  
(6 marks)
- c. A university cafeteria wants to store the number of meals sold for 4 different food stalls over 6 days (Monday to Saturday). Each stall has sales recorded for each day.
- i. Identify the most suitable type of array to store this data.  
(1 mark)
- ii. Write the Java declaration statement to create a suitable array to store the sales data.  
(3 marks)
- a. Given the following Java program that manages a list of workshops offered by a technology bootcamp and checks for the presence of a workshop named "**UI/UX Design**". What is the **OUTPUT** of the program below:

```
import java.util.Scanner;

public class TechBootcamp {
 public static void main(String[] args)
 {
 Scanner input = new Scanner(System.in);
 String[] workshops = {
 "Java Programming", "Mobile App Development",
 "Cybersecurity Basics", "UI/UX Design"
 };
 System.out.println("Workshops offered by the
technology bootcamp:");
 for (int i = 0; i < workshops.length; i++)
 System.out.println((i + 1) + ". " +
workshops[i]);
 // Assume the user searches for a workshop named
"UI/UX Design"
 System.out.print("\nEnter a workshop name to
check availability: ");
 String searchWorkshop = input.nextLine();
 boolean isPresent = false;
 for (String workshop : workshops)
 {
 if
(workshop.equalsIgnoreCase(searchWorkshop))
 {
 isPresent = true;
 break;
 }
 }
 if (isPresent)
 {
 System.out.println(searchWorkshop + " is
available in the bootcamp.");
 }
 else
 {
 System.out.println(searchWorkshop + " is NOT
available in the bootcamp.");
 }
 // Display total number of workshops
 System.out.println("\nTotal workshops offered: "
+ workshops.length);
 }
}
```

(8 marks)

**CONFIDENTIAL**

**DECEMBER 2025/SET B/SWC2493**

(Total: 20 marks)

(TOTAL: 70 MARKS)

(TOTAL: 100 MARKS)

**END OF QUESTION PAPER**

