



PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF COMPUTING AND INFORMATICS
DEPARTMENT OF SOFTWARE ENGINEERING

QUALIFICATION: BACHELOR OF COMPUTER SCIENCE, BACHELOR OF COMPUTER SCIENCE IN CYBER SECURITY AND BACHELOR OF INFORMATICS	
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COURSE: PROGRAMMING 1	COURSE CODE: PRG510S
DATE: NOVEMBER 2023	PAPER: THEORY
DURATION: 2 HOURS	MARKS: 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS
<ol style="list-style-type: none">1. Answer ALL the questions.2. Read all the questions carefully before answering.3. Number the answers clearly.

THIS QUESTION PAPER CONSISTS OF 5 PAGES
(Including this front page)

SECTION A: TRUE OR FALSE

This section consist of 20 questions. Answer all the questions

Each correct answer is allocated 2 Marks

Write True or False for Questions 1 to 20.

1. Declarations must appear at the start of the body of a Java method. [2 Marks]
2. The statement `d = a/-b;` is a valid java statement. [2 Marks]
3. Built-in functions are the same as user-defined functions. [2 Marks]
4. This is a valid statement in Java: `int ++a = 100;` [2 Marks]
5. Arrays cannot be created and initialize as in this statement:
`int x[] = new int[] {10,20,30};` [2 Marks]
6. The following are NOT valid identifier names: `9FirstName, %School.` [2 Marks]
7. The Java statement: `int = Num1 + Num2 *Sum3` is valid. [2 Marks]
8. The code segment `int x = 8; System.out.println(x--);` prints 8 on the screen. [2 Marks]
9. In Java, a Try statement must end without Catch statement. [2 Marks]
10. In programming a method, is recursive if it contains a call to itself. [2 Marks]
11. Windows and GUI programming are similar. [2 Marks]
12. Fabonaci and factorial are NOT good examples to demonstrate recursion. [2 Marks]
13. Division by 0 or index out of array range throws an exception handling. [2 Marks]
14. Heap technique is a search algorithm. [2 Marks]
15. In Java, the identifiers `sbank, sBank and SBANK` are all the same. [2 Marks]
16. In Java, a for loop inside another for loop is regarded as structure loop. [2 Marks]
17. In Java, double quote such as `"\n Hello World "` is a char. [2 Marks]
18. This statement `var += a;` is equivalent to `var = var + a.` [2 Marks]
19. For the expression `(y>=z && a==b)` to be true, both of `(y>=z)` and `(a==b)` must be true. [2 Marks]
20. This statement `double amount = 2.5, interestRate = 89.5;` implies: declaration and assignment. [2 Marks]

SECTION B: FILL THE GAP

Examine the following cases, then for each case decide the correct data type to be used and create a valid declaration and assignment.

21. The average weight of students in a class is 47: [2 Marks]
22. The name of your family is Johnson: [2 Marks]
23. Whether or not an aircraft is moving: [2 Marks]
24. The amount of money in your bank is 3050.00: [2 Marks]
25. The grade you obtained in a certain subject is A: [2 Marks]
26. The number of your house in your street: [2 Marks]

SECTION C: CODE SNIPPET

This section consist of 3 questions. Answer **ALL** the questions
Each correct answer is allocated 8 Marks

Question One

[8 Marks]

The Java program below (Grade.java) use *if* statement to determine the grade based on mark obtained by student. Score is read from the keyboard and grade is calculated as follows:

<u>Mark</u>	<u>Grade</u>	<u>Status</u>
75-100	Distinction	A
70-74	Merit	B
60-69	Credit	C
50-59	Pass	D
0-49	Fail	F

//Grade.java

1. import java.util.Scanner;
2. public class Mark {
3. public static void main(String[] args) {
4. string mark;
5. string status;
6. Scanner console = new Scanner(System.in)
7. Syste.println("Enter your numeric exam mark : ");
8. mark = console.nextInt();
9. if (mark >= 75) { status = 'A'; }
10. else if (mark >= 70) { status = 'B'; }
11. else if (mark >= 60) { status = 'C'; }
12. else if (mark >= 50) { status = 'D'; }
13. else { status = "F"; }
14. System.out.println("Your Status is : " + status); }
15. }

In the Java program above (Grade.java), identify which lines (numbers on the left) have errors and describe the error.

Question Two

[8 Marks]

(A) Giving the program (example1.java) below, identify the error(s) in the Java code snippet. [6 Marks]

1. //example1.java
2. public class Main{
3. public static void main(String []args){
4. int x = 5; String y = 10;
5. if (z < y)
6. System.out.println("x is less than y");
7. else if (x > y)
8. System.out.println("x is greater than y");
9. Else
10. System.out.println("x is equal to y");
11. }
12. }

(B) Identify the error(s) in the code snippet below:

[2 Marks]

```
1. //example2.java
2. import java.util.Scanner;
3. public class Lab01_A {
4.     public static void main(String[] args) {
5.         Scanner sc = new Scanner(System.in);
6.         System.out.println("Enter First Number: ");
7.         N1 = sc.nextInt();
8.         System.out.println("Enter Second Number: ");
9.         N2 = sc.nextInt();
10.        S1 = N1 + N2;
11.        System.out.println(S1);
12.    }
13. }
```

Question Three

[8 Marks]

Rewrite the following piece of code using a for loop:

```
Public static void Display (String [ ] Lnames, int [ ] Stud_marks) {
    int J = 0;
    while (J < Lnames.length ) {
        System.out.println(Lnames[J]+ "\tStudent's Score: "+Stud_marks[J]);
        J += 1;
    }
}
}
```

SECTION D: CODES/THEORY

Answer all questions

Each correct answer is allocated 8 Marks

Question One

[8 Marks]

(A) Write a Java program to find the average of 3 real numbers. The program should accept 10 different set of numbers using a loop.

[4 Marks]

(B) Write a Java program to calculate Body Mass Index (BMI), the BMI value is calculated based on the inputs given by the user in metric units. BMI is used to measure the body mass based on the height and weight of the individual. The range of BMI classifies individuals as Underweight, Normal, Overweight or Obese. We have categorized our BMI range as follows:

[4 Marks]

Table 1: Body Mass Index categories

Category	BMI Range
Underweight	< 18.5
Normal	18.5 - 25
Overweight	> 25 and < 30
Obese	30 and above

The formula for calculating BMI in Metric Units is:

$BMI = \text{Weight in Kg} / (\text{Height in Meters} * \text{Height in Meters})$

For example, let us consider height = 1.50m and weight = 90.0kg

$BMI = 90.0 / (1.50 * 1.50) = 40.0$ (You are Obese).

Here is a sample output of the BMI Calculator program:

Enter your weight in kg: 90.0

Enter your height in cm: 1.50

Your BMI value: 40.0

Status: You are Obese

Question Two

[8 Marks]

Write a Java program that will accept two numbers as input from the keyboard and find the largest of the two Numbers

Question Three

[8 Marks]

Write a Java program to sum even numbers between startNo and endNo.

You may either use a *for* statement or any other looping statement in Java.

The following should be programmed:

Two numbers (startNo and endNo) should be accepted as input from the keyboard.

(a) If startNo is less than 0 then the program should print "startNo cannot be less than 0" and the program will end. **(2 Marks)**.

(b) If endNo is less than 0 then the program should print "endNo cannot be less than 0" and the program will end. **(2 Marks)**.

(c) If endNo is greater than 9 then the program should print "endNo cannot be greater than 9" and the program will end. **(2 Marks)**.

(d) But, if the right numbers (startNo and endNo) are entered ie any two numbers within 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, then the sum of even numbers between startNo and EndNo will be calculated and the program will printout "Sum of Even Numbers = " sumEven. **(2 Marks)**.

Sample output 1:

Input: Enter 2 Numbers separated with a space (startNo and endNo): -3 7

Output: startNo cannot be less than 0

Sample output 2:

Input: Enter 2 Numbers separated with a space (startNo and endNo): 2 -9

Output: endNo cannot be less than 0

Sample output 3:

Input: Enter 2 Numbers separated with a space (startNo and endNo): 2 20

Output: endNo cannot be greater than 9

Sample output 4:

Input: Enter 2 Numbers separated with a space (startNo and endNo): 2 8

Output: Sum of Even Numbers = 20

[Hint: Even numbers from 2 to 8 are: 2,4,6,8, therefore Sum = 2+4+6+8=20]

————— THE END —————