



# UNIVERSITI TEKNOLOGI MALAYSIA FACULTY OF COMPUTING

## TEST 1

**SEMESTER II 2022/2023**

**SUBJECT CODE : SCSJ1013**  
**SUBJECT NAME : PROGRAMMING TECHNIQUE I**  
**YEAR/COURSE : 1 (SCSJ / SCSV / SCSB / SCSR)**  
**TIME : 1 HOURS 30 MINUTES (5:00 – 6:30p.m.)**  
**DATE : 16 MAY 2023**  
**VENUE :**

### INSTRUCTIONS TO THE STUDENTS:

This test book consists of two parts:

PART A:	5 QUESTIONS	(25 MARKS)
PART B:	2 QUESTIONS	(25 MARKS)
<b>TOTAL</b>		<b>(50 MARKS)</b>

**ANSWER ALL QUESTIONS IN THIS BOOKLET IN THE SPACES PROVIDED.**

*Additional answer sheets will be given upon request.*

<b>Name</b>	
<b>I/C No.</b>	
<b>Year/Course</b>	
<b>Section</b>	
<b>Lecturer's Name</b>	

This question booklet consists of **11 pages** inclusive of the cover page.

**PART A: PROBLEM-SOLVING QUESTIONS****[25 marks]****QUESTION 1****[7 marks]**

Draw a flowchart to calculate the price of handbag after discount. The steps for calculating are as follows:

- a) Get the brand of handbag, tag colour and price.
- b) if the tag colour is yellow, call a user-defined function named "yellowTag", calculate the price and return to main function.
- c) if the tag colour is red, call a user-defined function named "redTag", calculate the price and return to main function.
- d) if the tag colour is not yellow or red, call a user-defined function named "colorTag", calculate the price and return to main function.

Based on **Table 1** below, calculate the price of the handbag after discount.

**Table 1:** Discount for each tag colour

Tag colour	Discount
Yellow	50%
Red	30%
Not yellow or red	10%

**Note:** The calculation of the handbag price must be done only in the user defined function as named in (b), (c) and (d) accordingly, so a variable (or more) must be passed from the main function (main flowchart) for the calculation. The price after discount must be returned to the main function once the calculation is finished. The price after discount will only be displayed in the main function.

Finally, in the main function, display the brand of handbag, the original price before discount and the price after discount.



**QUESTION 2****[3 marks]**Trace the following pseudo code and write the output in **Table 2**.

```

1. Start
2. Set price = 0
3. Read quantity, level
4. If (level = "Low")
    4.1 If (quantity >= 0) AND (quantity < 15)
        4.1.1 price = quantity * 0.3
    4.2 Else_If (quantity >= 15) AND (quantity <= 50)
        4.2.1 price = quantity * 0.5
    4.3 Else_If (quantity >= 51)
        4.3.1 price = quantity * 0.7
    4.4 End_If
5. Else
    5.1 If (quantity > 0) AND (quantity <= 10)
        5.1.1 price = quantity * 0.2
    5.2 Else_If (quantity > 10) AND (quantity <= 20)
        5.2.1 price = quantity * 0.3
    5.3 Else_If (quantity > 20)
        5.3.1 price = quantity * 0.6
    5.4 End_If
6. End_If
7. Display price
8. End

```

**Table 2:** Tracing table for Question 2

quantity	level	Output	MARK
51	Low		
0	Medium		
20	High		

**QUESTION 3****[5 marks]**

The following program code has errors. Locate the errors. Fill in the following table by stating the line number and write the correct statement.

**Table 3:** Program segment for Question 3

Line	Code
1	#include <iostream>
2	using namespace std;
3	int Main()
4	{
5	int number1, number2;
6	int quotient;
7	cout << "Enter two numbers and I will divide\n";
8	cout << "the first by the second for you.\n";
9	cin >> number1, number2;
10	quotient = number1 / number2;
11	cout << quotient
12	return 0;
13	}

**Table 4:** Answer for error location and correct statement for Question 3

Line number	Correct Statement	MARK


**QUESTION 4****[5 marks]**

Trace the output of the following code segment and identify either the given condition in the code is TRUE or FALSE based on the given input in the box. **Note:** ASCII value of 'A' = 65, the value of ASCII code for each letter after 'A' will be added by 1.

**Answer:****Table 5:** Tracing table for Question 4

<pre> char letter; double angka; int jumlah;  cout &lt;&lt; "Please insert a letter and a number" &lt;&lt; endl; cin &gt;&gt; letter &gt;&gt; angka;  if ((letter &gt;= 'F') &amp;&amp; (--angka != 23))     jumlah = letter + angka++; else     jumlah = letter / ++angka;  cout &lt;&lt; jumlah; </pre>	letter	angka	T/F?	jumlah
	F	24		
	C	20.5		
	H	33.8		
	J	24.2		
	B	6		

**QUESTION 5****[5 marks]**

Determine the output of each code segment below (if any) for the given value of n is 1 (n=1).

**Note:** Write the text "<NO OUTPUT>" If the code does not print anything.

1.	<pre> if (n &gt;=0)     if (n&lt;=10)         cout &lt;&lt; "Hi ";         cout &lt;&lt; "There ";      else         cout &lt;&lt; "Hello ";         cout &lt;&lt; "World "; </pre>
2.	<pre> switch (n){     case 0: cout &lt;&lt; "Welcome To ";     case 1:  cout &lt;&lt; "Programming Technique 1 ";     case 2:  break;     case 3:  cout &lt;&lt; "Programming Class "; } </pre>
3.	<pre> cout &lt;&lt; ( n%2==0 ?  n*10 : n + 10 ); </pre>

4.	<pre> int n; do {     cout &lt;&lt; "Enter a non-negative integer: ";     cin &gt;&gt; n;     if (n &lt; 0)         cout &lt;&lt; "The integer you entered is negative."&lt;&lt;endl; } while (n &lt; 0); </pre>
5.	<pre> for (int i=1; i&lt;3; i++){     int n=1;     while (n&gt;0){         cout &lt;&lt; "i=" &lt;&lt; i &lt;&lt; "  n=" &lt;&lt; n&lt;&lt; endl;         n--;     } } </pre>

**Answer:****Table 6:** Tracing table for Question 3

No.	Answer	MARKS
1.		
2.		
3.		
4.		
5.		

**PART B: PROGRAMMING QUESTIONS****[25 Marks]****QUESTIONS 1****[10 Marks]**

The following program should perform the following steps:

1. Ask the user for the diameter of the pizza in inches.
2. Calculate the radius of the pizza. Radius is half of the diameter.
3. Calculate the area of the pizza using the formula of  $\text{Area} = \pi r^2$ , where r is the radius of



the pizza.

4. Find the area of a pizza slice when it is divided into 8 equal pieces.
5. Display a message telling the area of a slice.

The following program code is incomplete and has some errors. Locate the errors. Fill in the following table by stating the line number and write the correct statement.

**Table 7:** Program segment for Question 1

Line	Code
1	#include <iostream>;
2	using namespace std;
3	int main()
4	{
5	constant double PI=3.14159;
6	constant int SLICE;
7	double diameter; area; radius;
8	
9	cout <<"Enter the diameter of the pizza in inches: ";
10	cin >> _____
11	
12	_____ // calculate the radius of the pizza
13	_____ // calculate the area of pizza
14	
15	cout << "Area of the pizza is : " << area;
16	cout << " inches squares " << endl;
17	cout << "Each pizza slice area is : " << area/SLICE;
18	cout << " inches squares " << endl;
19	}

**Answer:**

**Table 8:** Answer for error location and correct statement for Question 1

Line number	Correct Statement	MARK

## QUESTIONS 2

[15 Marks]

**Table 9** below shows the price of coffee and additional items for coffee shop ordering apps. Complete the code using if statement where:

1. User can order by selecting a list of available coffee drinks.
2. Users can optionally customize their coffee by selecting additional items.
3. Calculate coffee cost using variable **CoffeeCost**, calculate additional item cost using **AdditionalCost** and calculate total cost using **totalCost**.

**Table 9** Coffee and Additional Item Price

Service	Type	Price (RM)
Coffee	Americano	5.00
	Latte	6.50
	Mocha	7.00

	Cappuccino	<b>6.50</b>
Additional	Espresso (2 shots)	<b>1.50</b>
	Whip Cream	<b>2.00</b>
	Caramel	<b>1.50</b>

**Answer:**

```
// declare variables to store the user's selections and the
total cost

string coffeeType, additionalItem;
int quantity_coffee, quantity_additional;
double price_coffee = 0.0, price_additional = 0;

// display the available coffee types and additional items
cout << "Available coffee types:" << endl;
cout << "1. Americano (RM5.00)" << endl;
cout << "2. Latte (RM6.50)" << endl;
cout << "3. Mocha (RM7.00)" << endl;
cout << "4. Cappuccino (RM6.50)" << endl;

// prompt the user to select a coffee type and enter a quantity
cout << "Please select a coffee type (1-4): ";
cin >> coffeeType;
cout << "Please enter a quantity: ";
cin >> quantity;
```

```
// calculate the base price of the coffee based on the  
user's selection
```

---

---

---

---

```
// prompt the user to select additional items
```

```
cout << "Would you like to customize your coffee with any additional items?" << endl;  
cout << "1. Espresso (2 shots) (RM1.50)" << endl;  
cout << "2. Whip Cream (RM2.00)" << endl;  
cout << "3. Caramel (RM1.50)" << endl;  
cout << "Enter '0' to skip." << endl;  
cin >> additionalItem;  
cout << "Please enter a quantity: ";  
cin >> quantity2;
```

```
// calculate the cost of the additional items based on the user's selection
```

---

---

```
// calculate the total cost of the order

_____ //total cost calculation

//display order summary

cout << _____ << " x " << _____ << " @ RM" << _____ << " = RM" <<
_____ << endl;
cout << _____ << " x " << _____ << " @ RM" << _____ << " = RM" <<
_____ << endl;

cout <<" Total Cost RM" << _____ << endl;
_____
_____

return 0;

}
```