

**UNIVERSITY COLLEGE TATI (UC TATI)****FINAL EXAMINATION QUESTION BOOKLET**

COURSE CODE	: FCT1033
COURSE	: PROGRAMMING I
SEMESTER/SESSION	: 1-2023/2024
DURATION	: 3 HOURS

**Instructions:**

1. This booklet contains 4 questions. Answer **ALL** questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise your hands and ask the invigilator.

**DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO**

**THIS BOOKLET CONTAINS 6 PRINTED PAGES INCLUDING COVER PAGE**

## QUESTION 1

- a) Rewrite the following mathematical expression into an equivalent C++ expression with all variables declared as integers. (5 marks)

$$x = \sqrt{z^2 - y^2}$$

- b) Evaluate the following expressions and provide all solution steps for full marks.

(i)  $20 - 13 \% 2 + 18 / 9$  (2 marks)

(ii)  $42 \% 36 - 6 + 36 / 7 * 4$  (2 marks)

(iii)  $5 / 9 * (32.6 - 4.5)$  (2 marks)

## QUESTION 2

- a) Consider the following program segment. Questions from (i) to (iv) are considered to be part of one complete program solution.

```
#include <iostream>
#include <string>

using namespace std;
int main ()
{
    //variable declaration
    //executable statements

    return 0;
}
```

- (i) Write a C++ statements that declares and initializes a constant named **diskaunSaman** of type float with the value 70/100. (3 marks)
- (ii) Write C++ statements that declare the following variables: **saman** and **bayaran** of type int and variable **car\_plate** of type String. (3 marks)

- (iii) Write C++ statements that prompt the user to input car plate number (example TTT123) and total amount of summon. Store the car plate number in **car\_plate** and total amount of summon in **saman**. (3 marks)

Example:

Masukkan no plat kereta : TTT123 <enter>  
 Jumlah saman terkumpul : RM1000 <enter>

- (iv) Calculate the amount that the user needs to make payment from the 70% fixed discount given for all users and store the result in **bayaran**. Then, write C++ statement that outputs the value of **bayaran**. (4 marks)

For example, if total summons amount (Jumlah saman terkumpul) is RM1000, then the output is:

Jumlah bayaran (dipotong 70% diskaun) : RM 300  
 Note: RM300 is the result from the calculation.

- b) Given the coding in Figure 1 is to calculate the BMI result of a person. There are **TWO (2)** errors exist in the program. State which lines and fix the errors. (4 marks)

```

1  /*This program calculate the BMI of a person*/
2  #include <iostream>
3
4  using namespace std;
5
6  int main()
7  {
8      double weight;
9      double heighth;
10     double BMI;
11
12     cout<<"Enter your height in meter :";
13     cin>>height;
14
15     cout<<"\nEnter your weight in kilogram :";
16     cin>>weight;
17
18     BMI == weight / (height * height);
19
20     cout<<"\nYour BMI is : "<<BMI;
21
22     return 0;
23 }

```

Figure 1

- c) Give suitable variable declaration (*data type and identifier*) for this statement:
- (i) Number of students registered on July 2023 in UC TATI. (2 marks)
  - (ii) Percentage of FIT students from all Foundation program's student. (2 marks)
  - (iii) Matric number for all registered students. Example, 23A18G001. (2 marks)

### QUESTION 3

Consider the given scenario and answer the following questions:

"Four workers were assigned a pick of oranges. The owner of the orange plant is given 40% of the orange fruit. The workers share the rest equally and the remainder is used to make juices. The input is the number of oranges picked up. You are required to calculate and print the number of oranges received by the planters, each employee and the number of oranges used to make orange juice."

- a) Identify the Input, Process and Output. (10 marks)
- b) Write a C++ program to produce the output identified in Question 3(a). You may refer to the sample interface as shown in Figure 2. (23 marks)

Total oranges picked : **1000 <entered>**

The owner will get : **400** oranges

Each of employee will get : **150** oranges

And **0** oranges will be used to make juices

Figure 2

**QUESTION 4**

- a) Draw the flowchart for the following step-by-step procedure (11 marks) here.

1. Program start.
2. The user will be asked to input their start year at the company.
3. Read the input year.
4. The program will compute the years of service by subtracting the user's employment start year from the current year, 2023.
5. If the years of service **exceed 20 years**, display the message "*Layak untuk Anugerah Perkhidmatan Setia*".  
Else display "*Tidak cukup 20 tahun perkhidmatan*"
6. Program end.

- b) Figure 3 displays the names of generations and their respective year range. Write a C++ program where user will be prompted to enter the born year, and the name of the generation will be displayed referring to Figure 3. Example of the sample outputs are displayed in Example 1 and 2.

Your program also must handle the case of *if user was born before 1901 or after 2025*, display a message "Not define!" as shown in Example 3 and 4.

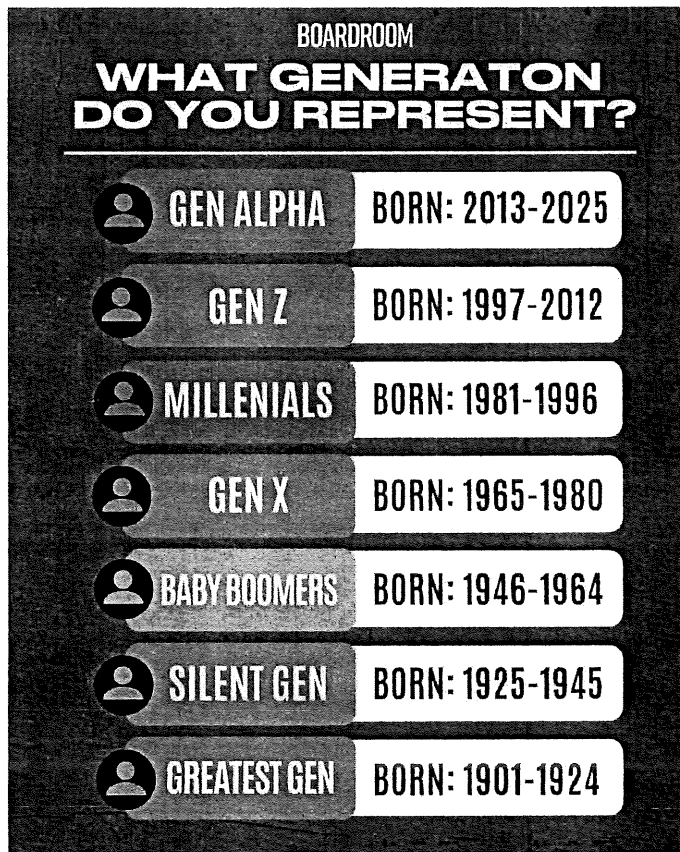


Figure 3

**Example 1**

State the year you were born: 1985  
Millennials

**Example 2**

State the year you were born: 1943  
Silent Gen

**Example 3**

State the year you were born: 1900  
Not define!

**Example 4**

State the year you were born: 2027  
Not define!

-----End of question-----