UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: BMT 1113
COURSE	: INTRODUCTION TO PROGRAMMING
SEMESTER/SESSION	: 1-2023/2024
DURATION	: 3 HOURS

Instructions:

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

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

THIS BOOKLET CONTAINS 7 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

a) Define a programming language and machine code.

(2 marks)

b) List the **three** (3) categories of software.

(3 marks)

c) Describe the number of format specifier functions in Table 1 below.

Table 1

Number Specifiers	Description
%d	
%f	
%o	

(3 marks)

d) Table 2 shows the data types in C language programming. Write the size (memory used) of the data types below.

Table 2

Integer	Size
int	
long	
float	
double	

(4 marks)

e) Rewrite the correct program according to the **ten** (10) syntax errors on the program below.

```
#include <math.h>
#include <stdioh>

int main()
int i, sum, num count = 0;
printf(All Armstrong number between 1 and 1000 are:\n);
for (i = 1; i <= 1000 i++)
{
num = i;
while (num != 0);
{
num /= 10;
count++;
}
num = i
sum = pow(num % 10, count)+ pow((num % 100 - num % 10) / 10, count)+ pow((num % 1000
- num % 100) / 100, count);
if (sum == i);
{
printf("%d " i);
}
count = 0
}
}
```

(5 marks)

QUESTION 2

a) Draw the **flowchart** for **do while** looping function.

(2 marks)

b) Refers to the algorithm to find the largest number among the three numbers below:

1. Start
2. Read the three numbers to be compared as A, B, and C.
3. Check if A is greater than B.
   3.1 If true, then check if A is greater than C.
      3.1.1 If true, print 'A' as the greatest number.
      3.1.2 If false, print 'C' as the greatest number.
   3.2 If false, then check if B is greater than C.
      3.1.1 If true, print 'B' as the greatest number.
      3.1.2 If false, print 'C' as the greatest number.
4. End

i) Produce the **flowchart** according to the algorithm given.

(8 marks)

ii) Produce the **program** by **using if.. else if** function.

(8 marks)

c) According to the program that compares two dates given below:

```
#include <stdio.h>
// Declaring the structure of Date
struct Date {
    int date;
    int month;
    int year;
            };
// Driver code
int main()
{
    int date1, date2, month1,
            month2, year1, year2;
    // Get the first date
    scanf("%d", &date1);
    printf("Enter the first date: %d", date1);
    scanf("%d", &month1);
    printf("\nEnter the first month: %d", month1);
    scanf("%d", &year1);
    printf("\nEnter the first year: %d", year1);
    // Initialise the structure with first date
    struct Date Date1 = { date1, month1, year1 };
    // Get the second date
    scanf("%d", &date2);
    printf("\nEnter the second date: %d", date2);
    scanf("%d", &month2);
    printf("\nEnter the second month: %d", month2);
    scanf("%d", &year2);
    printf("\nEnter the second year: %d", year2);
    // Initialise the structure with first date
    struct Date Date2 = { date2, month2, year2 };
    printf("\nThe given dates are: ");
    // Comparing the Dates
    if (Date1.date == Date2.date
            && Date1.month == Date2.month
            && Date1.year == Date2.year) {
            printf("Equal");
    }
    else {
            printf("Unequal");
    }
    return 0;
}
```

i) Illustrate the result for the input and output of the program after the run. (7 marks)

ii) Produce the **flowchart** according to the program given. (8 marks)

QUESTION 3

a) List the **five** (5) looping statements used in C programming.

(5 marks)

b) The program below shows the **if** function looping to prompt the user to enter their cholesterol level and then checks if it is normal, borderline high, or high.

```
#include <stdio.h>
int main()
{
   float cholesterol;
   printf("Enter your cholesterol level: ");
   scanf("%f", &cholesterol);
   if (cholesterol < 200)
   {
      printf("Your cholesterol level is normal.\n");
   }
   else if (cholesterol >= 200 && cholesterol < 240)
   {
      printf("Your cholesterol level is borderline high.\n");
   }
   else
   {
      printf("Your cholesterol level is high.\n");
   }
   return 0;
}
```

i) Produce the **program** by using **while** function statement.

(7 marks)

ii) Produce the **program** by using **switch** function statement.

(7 marks)

c) According to Table 3 below, write the description of each mathematical and logical symbol.

Table 3

Symbol	Description
&&	
!	
<<	
||	

(4 marks)

QUESTION 4

a) Simplify the arithmetic equation below in C language programming.

i) u=u+2;

(2 marks)

ii) v=v/5;

(2 marks)

iii) w=w%8;

(2 marks)

b) Explain the function of the **pre-increment operator (++n)** and **post-increment operator (n++)**.

(4 marks)

c) Produce the program for multiplying the matrix below using the 2D matrix array function in C language programming.

$$\begin{bmatrix} 2 & 3 & 4 \\ 5 & 6 & 7 \\ 8 & 9 & 1 \end{bmatrix} X \begin{bmatrix} 1 & 2 & 3 \\ 3 & 4 & 6 \\ 4 & 5 & 7 \end{bmatrix}$$

(12 marks)

d) Prove the result for matrix (3x3) x (3x3) above by manually calculating and showing the calculation steps.

(5 marks)