



UNIVERSITY COLLEGE TATI (UCTATI)

FINAL EXAMINATION QUESTION BOOKLET

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| COURSE CODE | : DCT1083 |
| COURSE | : PROGRAMMING FUNDAMENTALS |
| SEMESTER/SESSION | : 02 - 2024/2025 |
| DURATION | : 3 HOURS |

Instructions:

1. This booklet contains 5 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 up your hands 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

PROGRAMMING FUNDAMENTALS (DCT1083)

QUESTION 1

a) Correct the errors in the following statements:

- i) `cout<<"\n<<"15)` (1 mark)
- ii) `cout<<"setw(4)"<<33;` (1 mark)
- iii) `cout<<"setprecision(5)"<< 526.768;` (1 mark)
- iv) `"hello world!">>cout;` (1 mark)
- v) `cout<<47<<setw(6);` (1 mark)
- vi) `cout<<set(10)<<526.758<<setprecision(2);` (1 mark)

b) Determine and write out the output produced by the following statements:

i) (2 marks)

```
cout<<"|"<<setw(5)<<setiosflags(ios::fixed)
<<setprecision(2)<<534.264<<"|";
```

i) (4 marks)

```
cout << "The number is " << setw(6) <<
setiosflags(ios::fixed)
<< setprecision(2) << 26.27 << endl;
cout << "The number is " <<setw(6) <<
setiosflags(ios::fixed)
<< setprecision(2) << 682.3 << endl;
cout << "The number is " << setw(6) <<
setiosflags(ios::fixed)
<< setprecision(2) << 1.968 << endl;
cout << "The number is " << setw(6) <<
```

QUESTION 2

a) Given the following variable definitions, what is the result of each of the following test conditions? Mark each result with either a **t** (for true or 1) or **f** (for false or 0).

`int x = 10, y = 5, z = 42.`

- i) `if (x > 0)` (1 mark)

 PROGRAMMING FUNDAMENTALS (DCT1083)

- ii) if (x > 0 && z >= 10) (1 mark)
- b) Write the C++ selection statement according to the following instruction.
- i) Check if the value in an int variable named age is between 30 and 40, inclusive. (2 marks)
 - ii) Check if a char variable named code contains the letter R (in any case). (2 marks)
 - iii) Check if the value in an int variable named quantity is 5. (2 marks)
 - iv) Evaluates to TRUE if a char variable named letter contains the letter Z in either uppercase or lowercase. (2 marks)
 - v) Check if the value in a double variable named price is between 555.55 and 999.99 excluding 555.55 and 999.99. (2 marks)
- c) Use the program provided in Figure 1 to answer the following questions..

```

//the calculations section

subTotal = quantity * cost;

totalBeforeTax = subTotal - discount;
if (stateCode == 13)
    taxRate = .075;
else if (stateCode == 14)
    taxRate = .08;
else {
cout << "Invalid state code. It was " << stateCode << endl;
return 1;
}

```

Figure 1

- i) How many selections does the program have? List the available selections. (3 marks)
- ii) Describe the logical decision operator used in the program. (3 marks)

PROGRAMMING FUNDAMENTALS (DCT1083)

QUESTION 3

a) A repetition structure can be either a pretest loop or a posttest loop. Draw a flowchart for each type of loop. (6 marks)

b) For each of the following program segments, read the code and write the output.

i)

```
int i;
for ( i = 0; i < 5; i++ )
    cout << i << " ";
```

(2 marks)

ii)

```
int i,j;
for ( i = 0; i < 5; i++ )
    for ( j = 0; j < 3; j++ )
        cout << i << j<<endl;
```

(4 marks)

iii)

```
int x = 1;
while ( x <= 5 )
{
    x++;
    cout << "The value of x is: " << x << endl;
}
cout << "The final value of x is: " << x << endl;
```

(2 marks)

iv)

```
int i = 1;
do {
    cout << i << " ";
    i =i+2;
} while ( i <=10);
```

(2 marks)

PROGRAMMING FUNDAMENTALS (DCT1083)

v)

```
int i = 1;
do {
    cout << i << " ";
    i = 3;
} while ( i !=3);
```

(2 marks)

- c) Construct a program that uses a loop statement to calculate and print the average of 15 integers according to the following pseudocode (Figure 2).

```
Pseudocode
1. Set Sum = 0
2. Prompt user to enter integer
3. Read Integer (N)
4. Accumulate N to Sum
   Sum = Sum +N
5. Repeat steps 2 to 4 fifteen times
6. Calculate average of fifteen integer
   Average = sum / 15
7. Output Average
```

(6 marks)

Figure 2

QUESTION 4

- a) Give a definition of function prototype and write an example. (2 marks)
- b) Give an example of function prototype statement. (2 marks)
- c) The following code fragment (Figure 3) is a function named myName that takes a string called name as parameter. Create a main function that calls the myName function passing the name of ALI, AMINAH and HAMADULLAH one by one.

```
void myName(string name)
{
    cout << name << " as a reference\n";
}
```

Figure 3

(3 marks)

 PROGRAMMING FUNDAMENTALS (DCT1083)

- d) Construct a program that converts an amount in MYR to USD according to the following instruction:
- i) Write function named toUSD of type double that receive the value from the main function and return the USD cash to main function. (3 marks)
 - ii) Write main function that prompts the user to enter an amount in MYR, passes the amount to the toUSD function, and prints the amount in both MYR and USD (note: 1 MYR= 0.23 USD) (14 marks)

QUESTION 5

- a) What is array? (2 marks)

In C++, an array can be initialized in several ways. Identify the following initialization:

i) `int zero_array[5] = {0};` (1mark)

ii) `for (int i = 0; i < N; i++) {
arr[i] = value;
}` (1mark)

iii) `int arr[] = {1, 2, 3, 4, 5};` (1mark)

- b) Calculate the total number of elements that can be stored in a multidimensional array based onto the following declaration:

`int x[5][3]` (2 marks)

`int x[5][3][6]` (2 marks)

- c) Construct a program to display the First and the Last element of an array. Follow the following pseudocode to create a C++ program:

PROGRAMMING FUNDAMENTALS (DCT1083)

Start

Initialize counter, array size and current array size

Prompt the size of current array

Store the size of current array

Loop start

Assign counter to 0

If counter less than size of current array

Prompt the instruction to input the value of element

Store the value in the allocated array

Add 1 counter

Repeat the process until counter is more than size

Prompt the instruction to display the final element of an array.

(13 marks)

end

.....END OF QUESTION.....

