



UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2014/2015**

COURSE NAME : COMPUTER PROGRAMMING I
COURSE CODE : BWA 10103
PROGRAMME : 1 BWA
EXAMINATION DATE : DECEMBER 2014/JANUARY 2015
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

- Q1** What are the operator precedence and associativity? How do they affect program execution? Explain by example. (4 marks)
- Q2** Given the radius in inches and price of a pizza, design an algorithm to find the price of the pizza per square inch. (4 marks)
- Q3** Write a statement or a set of statements to accomplish the following task: Sum of odd integers between 1 and 99 using a for statement. Assume the integer variables sum and count have been defined. (4 marks)
- Q4** (a) Describe two uses of the break statement in C++. (2 marks)
- (b) Describe two uses of the & symbol in C++. (2 marks)
- Q5** Write a program segment to print the values of each element of array table in tabular format with 3 rows and 3 columns. Assume that the array was initialized with the declaration
- ```
int table [arraySize][arraySize] ={{1, 8}, {2, 4, 6}, {5}};
```
- and the integer variables i and j are declared as control variables. Show the input. (4 marks)

Q6 (a) Here is one way of calculating  $1 + 2 + \dots + n$ :

```
// Pre-condition: n is 1 or greater
// Post-condition: this functions returns the value of
// 1+2+...+n
// Examples: sum(1) is 1, sum(2) is 3, sum(3) is 6, ...
int sum (int n)
{
 int sum = 0;
 while (n > 0)
 {
 sum = sum + n;
 --n;
 }
 return sum;
}
```

Each question below will use the same header, so all you need to write is the code that would appear in the function body. Do *not* change the function header, or the behavior of the function.

- (i) Rewrite the body of the `sum` function using a single *for* – loop instead of a *while* – loop. (4 marks)
- (ii) Rewrite the body of the `sum` function using *do – while* loop instead of a *while* – loop. (4 marks)
- (iii) Rewrite the body of the `sum` function using *recursion* instead of a *while* – loop. (5 marks)
- (iv) Rewrite the body of the `sum` function using *no* loops or recursion. (2 marks)

- (b) When asked to create a program to find the volume of any cone given its radius and height, a programmer created this program to implement the formula.

$$V = \frac{1}{3}\pi r^2 h$$

It compiles, and it runs, but it gives completely incorrect results. A serious problem lies in the ComputeVolume function. Additionally, the programmer was confused about parameters and local variables. *Make this function work correctly* and also *improve its use of parameters*, changing main as necessary. Note any other minor or stylistic errors you might find throughout the program. You can simply note changes on the program listing.

```
doubleComputeVolume (double r, double h, double ans,
 double r2);

int main ()
{
 double radius, height, ans, r2;
 cout<< "Radius : " << radius;
 cout<< "Height : " << height;
 ans = ComputeVolume (radius, height, ans, r2);
 cout<< "Volume : " << ans;
}

doubleComputeVolume (double r, double h, double ans,
 double r2)
{
 r2 = r * r;
 ans = (1/3)* 3.14 * r2 * h;
 return ans;
}
```

(10 marks)

- Q7 (a) Determine whether the following code is correct. Justify your answer and give the correct code if appropriate.

```
int intvar = 333;
int * intptr;
cout << *intptr;
```

(5 marks)

- (b) Write a *complete* C++ program (only pre-condition and post-condition comments are necessary) that uses a function called `convert` to read an input text file and replace all the occurrences of the letter 'L' (uppercase or lowercase) with the string "Love", writing the converted text to an input file. The filenames should be input by the user, and sent to the function as arguments.

Hint: For example, if the input text file contains the following text:

Today is the last day of a very long semester

Then the output text file will contain the following text:

Today is the Loveast day of a very Loveong semester

(10 marks)

- Q8 Write a program that sorts an array of following 10 integers in **Table 1** by using *Bubble* sort.

**Table 1** : 10 integers

|                       |   |   |   |   |    |    |    |    |    |    |
|-----------------------|---|---|---|---|----|----|----|----|----|----|
| <i>i</i>              | 0 | 1 | 2 | 3 | 4  | 5  | 6  | 7  | 8  | 9  |
| <i>a</i> [ <i>i</i> ] | 2 | 6 | 4 | 8 | 10 | 12 | 89 | 68 | 45 | 37 |

(15 marks)

- Q9 (a) Write the function `swap`, which takes two pointers to integers and swaps the values pointed to by them. Show the proper way to call your `swap` function and print the output with your own value.

(15 marks)

- (b) Define Encapsulation and Polymorphism.

(10 marks)

- END OF QUESTION-