**Course**: CPSC 256: Programming in C/C++

**Duration**: 45 minutes

**Total Marks**: 50

Allowed Materials: Blank scrap paper, writing implements … no other materials/devices (including phone, laptop, etc.) are allowed.

**Instructions**: Answer all the questions in the spaces provided. Write clear and concise C code snippets where applicable. Ensure proper syntax and comments where necessary. For questions asking for explanations, write your answers in English.

**Question 1: Loops and Arrays (15 Marks)**

1. Write a code snippet that uses a for loop to get 6 integer values from the keyboard and stores these values in the elements of an array of size 6. Assume the array has already been defined. *(7 Marks)*

**B)** Write a C program using a while loop that calculates the product of the integers between 1 and 20, inclusive, i.e. 20\*19\*18\*17 …. \*2\*1. *(8 Marks)*

**Question 2: Code Explanation (10 Marks)**

**A)** Explain in plain English what the following C code does:

*(5 Marks)*

int arr[] = {5, 10, 15, 20, 25};

int sum = 0;

for(int i = 0; i < 5; i++) {

sum += arr[i];

}

printf("%d\n", sum);

**Explanation**:

**B)** Explain what the following code does, and describe what the output will be:

*(5 Marks)*

int i = 8;

int\* p = &i;

\*p = \*p\*2 ;

printf("%d\n", i);

**Explanation**:

**Question 3: Pointers and Structs (25 Marks)**

**A)** Write a C function to swap two integers using pointers.

*(10 Marks)*

**B)** Define a struct in C called Restaurant with three fields:

• name (string of 20 characters)

• cuisine (string of 20 characters)

• rating (int)

Then write a C snippet to create a Restaurant instance, initialize it, and print its details.

*(10 Marks)*