Programming Fundamentals

Mid-Term Exam

By Zarak Hassan & ID 16983

1 Year

**Programming Fundamentals Mid-Term:**

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**“C++ & Flowcharts”**

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| Q.1 |  |  |  |
|  |  | **Draw the flow chart and write a C++ program to get** two integer items from **keyboard** and **then** display to the screen their sum, difference, product and quotient.**Code:**#include <iostream> using namespace std; int main() {  int Num1, Num2; cout <<"Please enter the first number"; cin >> Num1; cout <<"Please enter the second number"; cin >> Num2; int Sum = Num1+Num2; int Diff = Num1-Num2; int Product = Num1 \* Num2; float Quotient = (float) Num1/Num2; cout<<"Sum = " <<Sum<<endl; cout <<"Diff = "<<Diff<<endl; cout<<"Product ="<<Product<<endl; cout<<"Quotient ="<<Quotient<<endl; }  |  |
|  |  | **Draw the flow chart and write a C++ program to** prompt the user for a temperature in degrees Celsius (C), then convert the temperature in degrees Fahrenheit (F) using the following formula and display temperature in Fahrenheit (F) on monitor.Code: #include<iostream> using namespace std; int main() { float fahrenheit, celsius; cout << "Enter the temperature in Celsius : "; cin >> celsius; fahrenheit = (celsius \* 9.0) / 5.0 + 32; cout << "The temperature in Celsius : " << celsius << endl; cout << "The temperature in Fahrenheit : " << fahrenheit << endl;return 0; } |  |
|  |  |  |  |
| Q.2 | a) | **Draw the flow chart and write a C++ program** that will prompt an operator to input three characters, receive those three characters, and display a welcoming message to the screen such as ‘**Hello xxx! We hope you have a nice day**.’ **Code:**#include <iostream>using namespace std;int main() { string characters; cout<<" Input three characters:"; cin>>characters; cout << "Hello " << characters.substr(0, 3) <<"! Hope you have a nice day"; return 0;} |  |
|  | b) | You were asked by your project leader to write a simple program that obtains the radius of a circle. The program calculates the area and perimeter then prints radius, the area and the perimeter. **Draw the flow chart and write a C++ program.Code:**#include <iostream>#include <cmath>using namespace std; int main() { float radius, area, circum; cout << "\n\n Find the area and circumference of anycircle:\n"; cout<<" Input the radius(1/2 of diameter) of a circle : "; cin>>radius;  circum = 2\*M\_PI\*radius; area = M\_PI\*(radius\*radius); cout<<" The area of the circle is : "<< area << endl; cout<<" The circumference of the circle is : "<< circum << endl;   cout << endl; return 0; } |  |
|  |  |  |  |
| Q.3 | a) | A student has to take three tests per semester. Each test has maximum marks of 50. By using a system, lecturer can enter marks obtained for each test as input. Draw a flowchart and write C++ program to calculate the percentage obtained by the student. Print the result.**Code:**#include <stdio.h>int main(void){int num;printf("Enter your mark ");scanf("%d",&num);printf(" You entered %d", num);  if(num >= 40){ printf(" You got A grade");  } else if ( num >=35){  printf(" You got B grade"); } else if ( num >=25){ printf(" You got C grade"); } else if ( num < 25){ printf(" You Failed in this exam"); }return 0;} |  |
|  | b) | **Draw the flow chart and write a C++ program** to calculate energy needed to heat water from an initial temperature to a final temperature. The user will enter the water amount (in kilograms) and its initial and final temperatures. The formula to compute the energy isQ = M \* (final temperature – initial temperature) \* 4184Where M is the weight of the water (in kilograms), temperatures are in Celsius and energy Q is measured in joules.  |  |

**Code:**

#include<iostream>

using namespace std;

 int main()

 {

 float initialTemperature, finalTemperature, kilograms, joules, M, Q;

 cout << "Enter the Amount of Water in Kilograms : ";

 cin >> kilograms;

 cout << "Enter the final temperature : ";

 cin >> finalTemperature;

 cout << "Enter initital temperature :";

 cin >> initialTemperature;

 Q = M\*(finalTemperature-initialTemperature)\*4184;

 cout << "Q : " << joules << endl;

 return 0;

 }
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**Flowcharts:**

**The Flowcharts are not in order, page 12 has Q1(B) Flowchart, thanks.**

**Q1 (A) FLOWCHART**



**Q2(A) FLOWCHART**



**Q2 (B) Flowchart**


**Q3(A) Flowchart**



**Q3(B) Flowchart**



**Q1 (B) FLOWCHART**

Display Temperature in Fahrenhite

fahrenheit = (celsius \* 9.0) / 5.0 + 32

Input temperature in Celsius

Read Celsius, Fahrenheit