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**Iqra National University Peshawar Pakistan**

**Department of Computer Science**

Spring Semester, Final Term Exam, July 2020

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| Paper : | **Programming Fundamentals (Lab)** | Date and Starting Time: | **09/July/2020, 09:00 am** |
| Program: | **BS (CS & SE)** | Uploading Date and End Time: | **09/July/2020, 3:00 pm** |
| Teacher Name: | **Dr. Fazal-e-Malik** | Marks | **100** |

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**ID: 16890**

**Note: Attempt all Questions.**

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| Q. 1 | Read A, B and C representing the three sides of a triangle. Write a program to find out its area the formula is given below:$$Area=\sqrt{S(S-A)(S-B)(S-C)}$$Where S= $\frac{A+B+C}{2}$**ANS) C++ CODE:** #include <bits/stdc++.h> using namespace std;  float findArea(float a, float b, float c) {  // Length of sides must be positive  // and sum of any two sides  // must be smaller than third side.  if (a < 0 || b < 0 || c < 0 ||  (a + b <= c) || a + c <= b ||  b + c <= a)  {  cout << "Not a valid trianglen";  exit(0);  }  float s = (a + b + c) / 2;  return sqrt(s \* (s - a) \*  (s - b) \* (s - c)); }  // Driver Code int main() {  float a = 3.0;  float b = 4.0;  float c = 5.0;   cout << "Area is " << findArea(a, b, c);  return 0; } |
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| Q. 2 | Write a C++ program to get marks obtained by a student in percentage ***P*** and then find the division according to the below rules:* If Percentage P is above or equal to 60 then display…………..1st Division.
* If Percentage Pis between 50 & 59 then display…………………2nd Division.
* If Percentage P is between 40 & 49 then display….……………3rd Division.
* If Percentage P is less than 40 then display………………………Fail.

**ANS) C++ CODE:** #include <stdio.h>int main(){ int phy, chem, bio, math, comp;  float per;  /\* Input marks of five subjects from user \*/ printf("Enter five subjects marks: "); scanf("%d%d%d%d%d", &phy, &chem, &bio, &math, &comp); /\* Calculate percentage \*/ per = (phy + chem + bio + math + comp) / 5.0; printf("Percentage = %.2f\n", per); /\* Find division according to the percentage \*/ if(per >= 70) { printf("1st Division"); } else if(per >= 60) { printf("2nd Division"); } else if(per >= 50) { printf("3rd Division"); } else if(per >= 40) { printf("Fail"); return 0;}} |
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| Q. 3 | Write a C++ program to convert 5 feet to the equivalent number of (a) Inches (b) Yards. Where 1foot =12 Inches and 1 yard=3 feet)**ANS) C++ CODE:** #include <iostream>using namespace std;intmain (){ int inches; int feet; int yards; cout << "Number of Inches\n"; cin >> inches; cout << "Number of Yards is\n"; yards = inches % 36; cout << yards; cout << "number of feet\n"; feet = inches % 12; cout << feet; cout << "number of inches\n"; cout << inches; yards = inches / 36; cout << yards; return 0;} |
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| Q.4 | Write a C++ program to find the sum of the following series:**2+4+6+8+10****ANS) C++ CODE:**#include <iostream>using namespace std;int main(){ int i, n, sum = 0; cout << "\n\n Find the sum of the series 2+4+6+8+10 (n+n):\n"; cout << "------------------------------------------------------------------------------------\n"; cout << " Input the value for nth term: "; cin >> n; for (i = 1; i <= n; i++)  { sum += i + i; cout << i << "+" << i << " = " << i + i << endl; } cout << " The sum of the above series is: " << sum << endl;} |
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| Q.5 | Write a C++ program to input Hours Worked and Hour Rate of an Employee. Calculate and display the Gross-Pay, Tax and Net-Pay; whereGross-Pay=Hour-Worked\*Hour-RateTax=10% of Gross-PayNet-Pay=Gross-Pay – Tax**ANS) C++ CODE:**#include <iostream>#include <iomanip>using namespace std;// Declare Functionsdouble computeGross( double hoursWorked, double hourlyWage);double computeDeductions(double grossPay);double computeNet( double grossPay, double deductions);void validateHours(double hoursWorked);void validateWage(double hourlyWage);int main(){ // Declare Variables double hoursWorked = 0; double hourlyWage = 0; double grossPay = 0; double deductions = 0; double netSalary = 0; // Get the hours worked and hourly wage cout << "Please enter the amount of hours worked (HH.MM): " << endl; cin >> hoursWorked; cout << "Please enter in your hourly wage: $" << endl; cin >> hourlyWage; validateHours (hoursWorked); validateWage(hourlyWage); grossPay = computeGross(hoursWorked, hourlyWage); deductions = computeDeductions(grossPay); netSalary = computeNet(grossPay, deductions ); // Output the results cout << fixed << setprecision(2) << "The net salary is: $" << netSalary << endl; return 0;}// compteGross() function - get gross salary based on hours worked and hourly wage.double computeGross(double hoursWorked, double hourlyWage){ return hoursWorked \* hourlyWage;}// computeDeductions() function - gets salary and calculates deductionsdouble computeDeductions(double grossPay){ double deductions; if(grossPay < 2500) { deductions = (grossPay \* .10) \* .175; } else { deductions = (grossPay \* .20) \* .175; } return deductions;}// computeNet() function - prints out gross salary,total deductions and net salarydouble computeNet(double grossPay, double deductions){ double netSalary; netSalary = grossPay - deductions; cout << "The gross salary is: $" << grossPay << endl; cout << "The total deductions are: $" << deductions << endl; cout << "The net salary is: $" << netSalary << endl; return netSalary;}// validateHours() function - input validation; hours worked can;t exceed 150 or be neg.void validateHours(double hoursWorked){ if(hoursWorked < 0 || hoursWorked > 150) { cout << "Error! Hours can't be negative or exceed 150\n"; }}// validateWage() - Input validation; wage can't exceed 200 or be negativevoid validateWage(double hourlyWage){ if(hourlyWage < 0 || hourlyWage > 200) { cout << "Error! Wage can't be negative or exceed 200\n"; }} |
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***Note: Please write your Name and ID on top of your answer Paper otherwise you will get zero marks.***