**Set – Alpha [For those whose Last Digit of ID is Odd]**

**International Islamic University Chittagong**

Department of Computer Science & Engineering

***Mid Term Examination, Spring 2022***

**CSE 1121** Computer Programming I

Total marks: ***21*** Time: 2 hours 30 minutes for exam + 30 minutes for submission

[Answer ***all*** the following questions. Figures in the right-hand margin indicate full marks.]

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| 1. a) | Determine which of the following are valid identifiers. If invalid, explain why?<br>**i) CSE-1121 ii) float iii) _abc iv) 1AM**<br>**v) Computer programming** | 1 |
| b) | ```<br>int main()<br>{<br>    // Value of p 10^5<br>    int p = 100000;<br>    // Value of q 10^5<br>    int q = 100000;<br>    int result = p * q;<br>    printf("%d",result);<br>    return 0;<br>}<br>```<br>Explain what is wrong with the above code and show the correct way to do it. | 1 |
| c) | ```<br>double a = 0.1;<br>if (a * 3 == 0.3)<br>{<br>    printf("Equal\n");<br>}<br>else<br>{<br>    printf("Not Equal\n");<br>}<br>```<br>What is the output of the above code segment? Explain why does this output come. | 1 |
| d) | Consider the following code that takes two integer values **A** and **B**. It calculates the average of these two values.<br>```<br>int A, B;<br>double avg;<br>scanf("%d%d", &A, &B);<br>avg = (A+B)/2;<br>printf("%.2f\n", avg);<br>```<br>Is the above code segment showing the correct output? If not, what should be done here? | 1 |
| e) | What are the differences between **gets(str)** and **scanf("%s", str)** where **str** is a character array? Explain with example. | 1 |

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| f) | Given working hours (**Hours**) and rate per hour (**Rate**) of an employee. Write *i) algorithm ii) flowchart* to compute an employee's **Gross pay** and **Net pay** using the formulas-<br>***Gross = Hours * Rate***<br>***Net = Gross – Tax***<br>**Tax** is subtracted from the Gross only if an employee earns more than ***TK. 15000/–***. Otherwise, deduct no **Tax**. **Tax** rate is ***10%*** of **Gross** pay. | 2 |
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| 2. a) | A C program contains the following declarations and initial statements:<br>`int i = 12, j = 15, k;`<br>`float x = 3.5, y = -1.1, z;`<br>Determine the value of each of the following assignment expressions. Use the values originally assigned to the variables for each expression. Show the calculations.<br>`i) k = i % j` `iii) y += (j/2)`<br>ii) `z = k = x` `iv) k = (j == 5) ? i++ : --j` | 1 |
| b) | What would be the output of the following code segment: (use separate boxes for each digit, blank space and other symbols)?<br>`int m = 786;`<br>`float x = 24.675234600;`<br>`char str[30] = "Morality";`<br>`i) printf("%08d\n",m);`<br>ii) `printf("%-12.3f\n",x);`<br>iii) `printf("%10.4g\n",x);`<br>iv) `printf("%8.3s\n", str);` | 1 |
| c) | A C program contains the following declarations and initial statements<br>`int n =-65, a = 100;`<br>`double r = -2.636`<br>`char ch = 'b';`<br>Write the C code segment [using C Library Functions] for the following tasks and find the values-<br>i) Absolute value of **n**.<br>ii) Logarithm value of **a** in base 10.<br>iii) Square root of **a.**<br>iv) Floor value of **r**<br>v) Check whether **ch** is in lowercase or uppercase | 2 |
| d) | An electricity board charges (*Energy charge*) the following rates to domestic users to discourage large consumption of energy:<br>`For the first 75 units: Tk. 4.0 per unit`<br>`For Next 325 units: Tk. 5.7 per unit`<br>`Beyond 400 units: Tk. 9.3 per unit`<br>All users are charged a minimum of Tk. `100/-` for Energy charge. If the total cost for Energy charge is more than Tk. `8000/-` then an additional surcharge of `15%` is added. In addition to this Energy charge, all users have to pay `Tk. 15/-` as *Demand charge* and `Tk. 10/-` as *Service charge*. So, **`Net Bill = Energy charge + Demand charge + Service charge`**<br>Write a C program to read the number of units consumed and print out the *Net Bill*. | 3 |
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| 3. a) | The following is a segment of a program:<br>`x = 10;`<br>`y = AA;  //Here AA is the last two digits of your ID`<br>`if (n > 0 )`<br>`x = x - 5; y = y + 7;`<br>`printf("x = %d y = %d", x, y);`<br>What will be the values of **x** and **y** if **n** assumes a value of i) **2** and ii) **0** ? Explain with rough calculations. | 1 |
| b) | Write a switch statement that will examine the value of an integer variable called *department* and print one of the following messages, depending on the value assigned to *department*:<br>**CSE,** if *department* has a value 1<br>**EEE,** if *department* has a value 2<br>**ETE,** if *department* has a value 3<br>**CCE,** if *department* has a value 4<br>**Not in Engineering Faculty,** if *department* has any other value | 1 |
| c) | Write a C program that will take three numbers as input, denoting the lengths of three sides of a triangle. Your program will output the area of the triangle if it is a valid one. Otherwise, it will write "No triangle possible".<br>**Sample Input** \| **Sample output**<br>1.0 1.9 3.0 \| No triangle possible<br>3.0 4.0 5.0 \| 6.0 | 2 |
| d) | You have given a number X. Print all the divisors of X and sum of the all even divisors of X. A number N is a divisor of X if N divides X i.e., if we divide X by N then the remainder is zero. If there is no even divisor print NULL<br>**Sample Input** \| **Sample output**<br>16 \| 1 2 4 8 16<br>Sum = 30<br>21 \| NULL<br>Here in the first example divisors of 16 are 1, 2, 4, 8, and 16. And the sum of all even divisors of 16 is 2+4+8+16 = 30. | 3 |