Set – Beta [For those whose Last Digit of ID is Even]

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 questions. Figures in the right-hand margin indicate full marks.]

1. a)	Determine which of the following are valid identifiers. If invalid, explain why? **i) 53rd ii) xy z iii) "CSE" iv) Float** **v) Computer_Programming**	1

b)	Consider the following code segment that takes two integer inputs **X** and **Y** **(here 1 <= X, Y <= 1,000,000,000)** and evaluates output for the equation $(X + Y)^2$.
	`int X, Y, Z;`
	`scanf("%d%d", &X, &Y);`
	`Z = (X + Y) * (X + Y);`
	`printf("%d\n", Z);`
	Explain what is wrong with the above code snippet and show the correct way to do it.
		1

c)	`float a = 5.24;`
	`double b= 5.24;`
	`if(a == b)`
	`printf("Yes");`
	`else`
	`printf("No");`
	What is the output of the above code segment? Explain why does this output come.
		1

d)	Consider the following code that takes an integer input **F** which represents temperature in the **Fahrenheit scale**. It converts the temperature to the **Celsius scale.**
	`int F;`
	`double cel;`
	`scanf("%d", &F);`
	`cel = (5 / 9) * (F - 32);`
	`printf("%.2f\n", cel);`
	Is the above code segment showing the correct output? If not, what should be done here?
		1

e)	What problem will arise when you take input in a ***character variable*** after another input. How can you solve this problem? Explain with a suitable example.	1
f)	Given the **Basic** of an employee. Write *i) algorithm ii) flowchart* to compute an employee's **Gross pay** and **Net pay** using the formulas- **Gross = Basic + House Rent + Medical Allowance** **Net = Gross – Tax** **Tax** is subtracted from the Gross only if an employee earns more than **TK.10000**. Otherwise, deduct no Tax. Tax rate is 12% of Gross pay. House Rent is **50%** of Basic and Medical Allowance is Tk. 500.	2

2. a)	A C program contains the following declarations and initial statements:
	`int i = 2, j = 5, k;`
	`float x = 3.5, y = -1.1, z;`
	Determine the value of each of the following assignment expressions. Use the values originally assigned to the variables for each expression. Show the calculations.
	i) `k = i % j` **iii)** `y += (j/2)`
	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)?
	`int m = 8123;`
	`float x = 34.567234600;`
	`char str[30] = "Quality";`
	i) `printf("%08d\n",m);`
	ii) `printf("%-10.2f\n",x);`
	iii) `printf("%12.3g\n",x);`
	iv) `printf("%7.3s\n", str);`
		1

c)	A C program contains the following declarations and initial statements
	`int n =-75, a = 400;`
	`double r = -0.43`
	`char ch = 'b';`
	Write the C code segment [using C Library Functions] for the following tasks and find the values-
	i) Absolute value of **n.**
	ii) Logarithm value of **a** in base 10.
	iii) Raised the value of **a** to power 3
	iv) Ceil value of **r**
	v) Convert **ch** to a capital letter.
		2

d)	An electricity board charges (*Energy charge*) the following rates to domestic users to discourage large consumption of energy:
	`For the first 75 units: Tk. 3.8 per unit`
	`For Next 325 units: Tk. 5.4 per unit`
	`Beyond 400 units: Tk. 8.7 per unit`
	All users are charged a minimum of Tk. `100/-` for Energy charge. If the total cost for Energy charge is more than Tk. `7000/-` then an additional surcharge of `12%` is added. In addition to this Energy charge, all users have to pay `Tk. 25/-` as *Demand charge* and `Tk. 15/-` as *Service charge*. So, **`Net Bill = Energy charge + Demand charge + Service charge`**
	Write a C program to read the number of units consumed and print out the *Net Bill*.
		3

3. a)	`x = 1;`
	`y = AA; ////Here AA is the last two digits of your ID`
	`if (n > 5)`
	`  if(n == 10)`
	`  x += 2;`
	`else`
	`  y -= 10;`
	`printf("%d %d ", x, y);`
	What will be the values of **x** and **y** if **n** assumes a value of i) **10** and ii) **3**. Explain with rough calculations.
		1

b)	Write a *switch* statement that will examine the value of an integer variable called *bus* and print one of the following messages, depending on the value assigned to *bus*: **`Agrabad`**, if *bus* has a value 1 **`Chawkbazar`**, if *bus* has a value 2 **`Boddharhat`**, if *bus* has a value 3 **`Mirsharai`**, if *bus* has a value 4 **`Out of range of transport facility`**, if *bus* has any other value.	1
c)	A student will not be allowed to sit in the exam if his/her attendance is less than 70%. Take two integer input: i) Number of classes held, ii) Number of classes he/she attended. Print the percentage of class attended and whether the student is allowed to sit in the exam or not. **Sample Input** / **Sample output** 100 80 / 80.00%, Allowed 50 30 / 60.00%, Not Allowed	2
d)	You are given **N** number of integer values. Find out all the values within them which are divisible by **3** and **5,** Also find their sum. First line of input contains an integer **N** followed by **N** number of integer values in the next lines. Print the values divisible by **3** and **5** separated by a space. Print the sum of these values in a separate line. **Sample Input** / **Sample output** 5 / 15 30 2 15 9 13 30 / Sum=45	3