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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Mid-Term Examination, Fall-2024
Course Code: CSE113, Course Title: Programming and Problem Solving
Level: L1 Term: T1 Batch: 67

Time: 01:30 Hrs **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1. **Illustrate** the following expressions in **detailed steps** where **A = 4, B = 7, C = 3, D = 2 & E = 6**. Remember all the variables here are integers and for every equation the initial value of A, B, C, D & E are the same. **Write each variable's value after every evaluation to obtain full marks.** — **CO1**

a) `A = (B > C) && !(D < E) || (A + B) * (C - D) / ++E` — [1.5]

b) `A += B++ - --C * (D / E) + (E % B)` — [1.5]

2. a) **Mention** how many errors you can find in the following code. **Explain** the errors as per your understanding with line no. and why you think it as an error. — [2] — **CO2**

```
1. #include <stdo.h>
2. int main() {
3.     int a = 5, b = 10;
4.     float c = 15.5;
5.     if (a < b {
6.         printf("a is less than b\n");
7.     } else {
8.         print("a is not less than b\n");
9.     }
10.    for (i = 0; i < 5; i++) {
11.        printf("i = %d\n", i);
12.    }
13.    int sum = a + b + c;
14.    printf("Sum is: %f\n", sum);
15.    return 0;
16. }
```

b) **Construct** the code without any errors. — [2]

3. **Construct** the Output for the given codes below (write only the output segment in a box) : — **CO3**

a) — [1.5+1.5]

```
#include <stdio.h>
int main() {
    float a = 5.5, b = 10.2;
```

b)

```
#include <stdio.h>
int main() {
    for (int i = 1; i <= 3; i++) {
```

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```
    int c = 3;

    if ((int)a % c == 0) {
        printf("Result: %.2f\n", a / c);
    }
    else {
        printf("Result: %.2f\n",
(float)((int)b % c));
    }
    return 0;
}
```

```
    for (int j = 1; j <= 3; j++) {
        if (i == j) {
            continue;
        }
        if (i + j == 4) {
            break;
        }
        printf("i = %d, j = %d\n", i, j);
    }
}
return 0;
}
```

4. Analyze the problem scenarios given below to write a full program for each of the following: **CO4**

a) Recently, Bangladesh has experienced a devastating flood that has affected many lives. As a prayer for the safety of all Bangladeshis, write a simple C program that outputs the following message: **May our people be safe from the flood!** **[3]**

Sample Input	Sample Output
NO INPUT	May our people be safe from the flood!

b) The recent flood has affected many lives. A team of relief workers is collecting foodgrains from different regions to help those in need. They have collected **(A)** kg of foodgrains from Dhaka, **(B)** kg from Chittagong, and **(C)** kg from Rajshahi. Unfortunately, **(D)%** of the foodgrains are lost during transportation. Write a C program to calculate the amount of foodgrains that will actually be delivered. **[4]**

Input: Four floating point numbers **A, B, C & D** as described above.
Output: The program should output the total amount of foodgrains delivered, formatted to two decimal places, in the following format:
A total of X.XX kg of foodgrains delivered

Sample Input	Sample Output
100.0 150.0 200.0 10.0	A total of 405.00 kg of foodgrains delivered

Sample Input	Sample Output
50.5 75.75 100.25 5.0	A total of 215.18 kg of foodgrains delivered

c) A team of rescue workers is tasked with delivering relief packages to various flood affected areas. Each package contains a certain number of essential items. The team will visit multiple locations, and the number of packages delivered at each location will be given as input. Write a C program to calculate the total number of packages delivered. **[4]**

Input: The program will take the following inputs:

- An integer **n** representing the number of locations.
- **n** integers representing the number of packages delivered at each location.

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Output: The program should output the total number of packages delivered in the following format:

A total of X packages delivered

Sample Input	Sample Output
3 10 20 30	A total of 60 packages delivered

Sample Input	Sample Output
4 5 15 25 10	A total of 55 packages delivered

d) A team of rescue workers is tasked with distributing relief packages to various flood affected areas. Each area will receive a certain number of packages. The team will visit multiple locations, and the number of packages delivered to each location will be stored in an array. Write a C program to calculate the total number of packages delivered and print the number of packages delivered to each location that received more than a specified threshold. [4]

Input: The program will take the following inputs:

- An integer **n** representing the number of locations.
- An array of **n** integers representing the number of packages delivered to each location.
- An integer **t** representing the threshold number of packages.

Output: The program should output the total number of packages delivered and the number of packages delivered to each location that received more than the threshold, in the following format:

A total of X packages delivered
Locations with more than Y packages:
Location i: Z packages

Sample Input	Sample Output
3 10 20 30 15	A total of 60 packages delivered Locations with more than 15 packages: Location 2: 20 packages Location 3: 30 packages

Sample Input	Sample Output
4 5 15 25 10 10	A total of 55 packages delivered Locations with more than 10 packages: Location 2: 15 packages Location 3: 25 packages