Final Examination Suggestion

Set 1

1.A) **Analyze** the following program and explain the errors with correction.

```
#include <stdio.h>
int main()
     {
          int sum;
  int k=1;
  for(int i=1;i>=10;i++);
  {
     sum=sum+k;
     k++;
  }
printf("The  value of sum is %ld", &sum);
   return 0;
}
```

1.B) Analyze the errors and correct:

```
#include <stdio.h>

int main() {

   int i, total;

   for(i=0; i<5; i++);

   total = total + i;

   printf("%d", total);

}
```

1.C) Find & correct the errors:

```
#include <stdio.h>

int main(){
```

```
   int x=5, y;
   for(int k=1; k<3; k++)
      y = y + x;
   printf("%f", y);
}
```

1.D) Debug and rewrite:

```
int main(){
   int s=0;
   for(int i=10; i>0; i--)
      s=s+i;
   printf("sum = %lf", s);
}
```

1.F) Correct the loop and output:

```
int main(){
   int a=1,b=1,sum;
   for(a=1; a<=5; a++);
      sum = sum + b;
   printf("Sum is %d", &sum);
}
```

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1.E) Debug this program:

```
int main(){
   int result=1;
   for(int i=1; i<=5; i++)
      result = result * i;
   printf("Factorial: %c", result);
}
```

Set 2

2.A) In a IT company, a junior developer is working on a C program that handles memory-level operations. His task is to design a function that can swap two numerical values stored in different memory locations without directly using assignment or arithmetic swapping (like temp = a; a = b; b = temp;).

As part of a testing module, he needs to demonstrate the use of pointers to access and modify values stored in memory.

Develop a C program to swap two numbers using pointers. The program should take two integers as input, display their original values, swap them using a function that accepts pointers, and finally display the swapped values.

2.B) A trainee in a IT company needs to create a C program to swap two floating-point numbers using pointers.
Write a program that takes two float inputs, displays their original values, swaps them using a pointer-based function, and prints the swapped result.

2.C) A developer is testing pointer operations in C. He must write a function that swaps two characters stored in memory.
Create a C program that inputs two characters, shows their original values, swaps them using pointers, and prints the final swapped characters.

2.D) A programmer is debugging a memory-management module. He is asked to swap two long integers using pointers.
Develop a C program that reads two long integers, displays their initial values, swaps them with a pointer-based function, and outputs the swapped values.

2.E) A student is learning pointers and needs to demonstrate swapping of two double values.
Write a C program that accepts two double numbers, displays the original values, swaps them using a pointer function, and prints the swapped values.

2.F) In a lab assignment, a junior coder is instructed to swap two short integers using pointers.
Create a C program that takes two short integers as input, prints the original values, swaps them through a function that uses pointers, and shows the swapped output.

Set 3

3.A) Explain call by value and call by reference in C with appropriate examples.

B) Write a C program using a while loop to compute the sum of the series:
5 + 10 + 15 + … + N

3.A) Describe the difference between call by value and call by reference, giving one example of each method.

B) Develop a C program to evaluate the series using a while loop:
4 + 8 + 12 + … + N

3.A) Demonstrate call by value and call by reference with simple C programs.

B) Write a C program to calculate the following series using a while loop:
6 + 12 + 18 + … + N

---

3. A) Differentiate call by value and call by reference with clear examples in C.

B) Create a C program using a while loop to find the sum of the series:
7 + 14 + 21 + … + N

3.A) Illustrate call by value and call by reference with examples.

B) Construct a C program to evaluate the following series 2+4+……+N using while loop.

Set 4

4.A)

Analyze the following module and find the output:

```
{
int n,i;
char vill[10];
char city [20] =" Dhaka";
char country [20] =" Bangladesh";
n=strcmp (city, country);
i=strlen(city);
strcpy(vill,country);
printf ("%d, %d",n,i);
printf("%s", vill);
strrev(vill);
puts(vill);
puts(strcat(city,country));
}
```

B) A polling system stores ages of 10 citizens in an array. Apply the array concept to implement a program in C to count how many citizens are eligible to vote (age ≥ 18).

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4. A)

Analyze the following module and find the output:

```
{
   int n, i;
   char vill[10];
   char city[20] = "Chittagong";
   char country[20] = "Bangladesh";

   n = strcmp(city, country);
   i = strlen(city);
   strcpy(vill, country);

   printf("%d, %d", n, i);
   printf("%s", vill);

   strrev(vill);
   puts(vill);

   puts(strcat(city, country));
}
```

---

4. B)

A survey system stores the ages of 12 participants in an array.
Write a C program using arrays to count how many participants are eligible to vote (age ≥ 18).

---

4. A)

Analyze the following module and determine the output:

```
{
   int n, len;
   char town[15];
   char state[20] = "Sylhet";
```

```
   char nation[20] = "Bangladesh";

   n = strcmp(state, nation);
   len = strlen(state);
   strcpy(town, state);

   printf("%d, %d\n", n, len);
   puts(town);

   strrev(town);
   puts(town);

   puts(strcat(state, nation));
}
```

4. B)

A local authority records the ages of 8 voters in an array.
Write a C program to count how many voters are eligible (age ≥ 18).

4.A)

Analyze the code module below and write the output:

```
{
   int cmp, length;
   char area[20];
   char place1[20] = "Rajshahi";
   char place2[20] = "Dhaka";

   cmp = strcmp(place1, place2);
   length = strlen(place2);
   strcpy(area, place2);

   printf("%d %d\n", cmp, length);
   puts(area);
```

```
   strrev(area);
   puts(area);

   puts(strcat(place1, place2));
}
```

4.B)

A study records ages of 15 residents in an array.
Write a C program to check how many residents are eligible for voting (age ≥ 18).

Set 5

5.A) In a banking software, you need to calculate the interest for a savings account based on balance and interest rate. Design a C program using a user-defined function to calculate and return the total balance after adding interest based on the given balance and interest rate.

B) Implement a C program that designs the following pattern for n=4 as input.

65

66 67

68 69 70

71 72 73 74

5.A) A finance application must calculate the final loan amount after adding a simple interest based on principal and yearly interest rate.
Write a C program using a user-defined function to return the updated amount after adding the interest.

B) Write a C program to generate the pattern for n = 5 starting from ASCII value 80:

```
80
81 82
83 84 85
86 87 88 89
90 91 92 93 94
```

5.A) A digital wallet system adds a bonus percentage to a user's wallet balance.
Create a C program using a function that accepts balance and bonus rate, calculates the bonus, and returns the updated balance.

B) Display the following pattern for n = 3, starting from ASCII value 50:

```
50
51 52
53 54 55
```

---

5. A) An investment tool computes the total value after applying annual growth percentage.
Write a program in C using a user-defined function to compute and return the final amount after growth.

B) Design a C program to generate this pattern for n = 4, starting at ASCII 100:

```
100
101 102
103 104 105
106 107 108 109
```

Set 6

6. A) Design a C program that defines a structure named Student to store a student's name, roll number, department, and marks in three subjects. The program should take input for three students and then display their details.

B) Suppose Array1={5,1,7,10,8} and Array2={2,9,10,3,5} are taken as input. Now Develop a program that prints Array3={1,1,7,1,3} as output.

---

6. **A)** Create a C program that defines a structure named Employee to store an employee's name, ID, department, and salary.
The program should take input for four employees and display their information.

B) Given:
Array1 = {4, 6, 8, 3, 9}
Array2 = {1, 6, 2, 7, 9}

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Write a C program to produce the following output:
Array3 = {1, 6, 2, 3, 9}

---

6. A) Write a C program defining a structure named Book to store the title, author, publication year, and price of a book.
Take input for three books and display all stored details.

B) Given arrays:
Array1 = {12, 5, 7, 9, 11}
Array2 = {10, 5, 14, 9, 6}

Develop a C program to generate:
Array3 = {10, 5, 7, 9, 6}

6.A) Design a C program that uses a structure named Product to store product name, product ID, category, and price.
Take input for five products and display all the details.

B) Given:
Array1 = {3, 15, 8, 20, 7}
Array2 = {5, 15, 2, 20, 9}

Write a C program that outputs:
Array3 = {3, 15, 2, 20, 7}