National University of Computer & Emerging Sciences, Karachi

Fall-2018Computer Science Department

Final Exam

17th December 2018, 09:00 am – 12:00 (noon)

Course Code: CS118	**Course Name: Programming Fundamentals**
Instructor Name: M. Shahzad / Dr. Farooque / Shoaib Rauf / Tania Iram	
Student Roll No:	**Section No:**

Instructions:

- Return the question paper and make sure to keep it inside your answer sheet.
- Read each question completely before answering it. There are **8 questions and 3 page**.
- In case of any ambiguity, you may make assumption. But your assumption should not contradict any statement in the question paper.
- You are **not allowed to write** anything on the question paper (except your ID and group).

Time: 180 minutes. **Max Points**: 53 Points

Question 1: Observe and try to understand the following programs. Write errors if there are any available or write outputs if the programs are fine. **[5 points]**

(i)

```
int main()
{
    char *s1 = (char *)malloc(50);
    char *s2 = (char *)malloc(50);
    strcpy(s1, "Hello");
    strcpy(s2, "World");
    strcat(s1, s2);
    printf("%s", s1);
    return 0;
}
```

(ii)

```
void main()
{
  int k=5;
  int *p=&k;
  int **m=&p;
  printf("%d %d %d",k,*p,**m);
}
```

(iii)

```
int main()
{
    int arri[] = {1, 2 ,3};
    int *ptri = arri;

    char arrc[] = {1, 2 ,3};
    char *ptrc = arrc;

    printf("sizeof arri[] = %d ",
sizeof(arri));
    printf("sizeof ptri = %d ",
sizeof(ptri));

    printf("sizeof arrc[] = %d ",
sizeof(arrc));
    printf("sizeof ptrc = %d ",
sizeof(ptrc));

    return 0;
}
```

(iv)

```
int main()
{
   int i = 0;
   for (i=0; i<20; i++)
   {
     switch(i)
     {
       case 0:
         i += 5;
       case 1:
         i += 2;
       case 5:
         i += 5;
       default:
         i += 4;
         break;
     }
     printf("%d  ", i);
   }   return 0;
}
```

(v)

```
int main()
{
    int a = 12;
    void *ptr = &a;
    printf("%d", *(int *)ptr);
    getchar();
    return 0;
}
```

Question 2: Print the following output using a C program. Take input name and print as triangle shape using each character of the name, ex. Input= "Jawwad". **[6 points]**

```
J

a     w

w     a     d

J     a     w     w

a     d     J     a     w
```

Question 3: Sajid wants to perform operation on a file. Help him write a program to count the number of rows stored in a file (.txt). What file mode will be a better choice for him and why?

[6 points]

Question 4: Create three text files named as Department.txt, Personal.txt and Combine.txt. Personal file contains ID and Name, Department file contains ID and Salary. Write a function which takes input as record IDs and gets the detail from both personal and department file and then adds this entry into combine file (ID, Name, Salary).

[6 points]

Question 5: Ali needs to compile result of two section together. Develop a system to merge the data from 2 different size arrays in 1 array by passing to a function using pointers. Also, return the address of new array and print this new Array from Main Function. **[6 points]**

void MergeArray (const void *Array1, size_t size1, const void *Array2, size_t size2);*

Hint: Don't use any built-in function. Use dynamic memory allocation.

Question 6: Develop a system for a queue management for a exhibition ticketing service, for a maximum of 50 people. Each person in queue has a ticket number and name (Hint: Use Structures). A queue is a first in first out data store technique. Write four functions as follows:

[12 points = 3 + 3 + 3 + 3]

a) A function which inserts new person in the queue.
b) A function which removes a person from queue.
c) A function to selects a person on the basis of given name. Print the data using pointer to structures.
d) A function which initializes a pointer to function, for each of above functions and calls using these new pointers. (Hint: Signature of functions must be same)

Question 7: Write a program which inputs inventory information from the user. Inventory information includes paper_order, ribbon_order and ink_order amounts. The program also asks user for an input as task_value (character) to select an operation based on the value of inventory.

[6 points]

- Increment total_paper by paper_order if task_value is 'B' or 'C';
- increment total_ribbon by ribbon_order if task_value is 'E', 'F', or 'D'.
- Increment total_ink by ink_order if task_value is 'A' or 'X'.
- If task_value is 'M' then print total_paper, total_ribbon and total_ink.
- Display an error message if the value of task_value is not one of these eight letters.
  (Note: the values of total_paper, total_ribbon and total_ink are already declared in the program.)

Question 8: A junkyard wants to keep track of how much tons of junk each of its three junk trucks collect each day during a typical week. Write a program that stores this information in a two dimensional 3 × 7 array, where each row represents a different junk truck and each column represents a different day of the week. The program should first have the user input the data for each junk truck. Then it should create a report that includes the following information: **[6 points]**

- Average quantity of junk collected per day by all the trucks.
- The least amount of junk collected during the week by any one truck.
- The greatest amount of junk collected during the week by any one truck.

BEST OF LUCK!