

**Final Exam**

**17<sup>th</sup> December 2018, 09:00 am – 12:00 (noon)**

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

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]**

<pre>(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; }</pre>	<pre>(ii) void main() {     int k=5;     int *p=&amp;k;     int **m=&amp;p;     printf("%d %d %d",k,*p,**m); }</pre>
<pre>(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; }</pre>	<pre>(iv) int main() {     int i = 0;     for (i=0; i&lt;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; }</pre>
<pre>(v) int main() {     int a = 12;     void *ptr = &amp;a;     printf("%d", *(int *)ptr);     getchar();     return 0; }</pre>	

**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 function which inserts new person in the queue.
- A function which removes a person from queue.
- A function to selects a person on the basis of given name. Print the data using pointer to structures.
- 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  $3 \times 7$  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!***