# WEEK-END ASSIGNMENT-08

## C Storage Classes & Recursion

**Operating Systems Workshop (CSE 3541)** 

#### **Problem Statement:**

Working with different storage classes and Experiment with one of the powerful tool, recursion, in problem solving and programming.

### **Assignment Objectives:**

To learn about storage classes and get the idea of how function calls itself to solve computational problem.

#### **Instruction to Students (If any):**

Students are required to write his/her own program by avoiding any kind of copy from any sources. Additionally, They must be able to realise the outcome of that question in relevant to systems programming. You may use additional pages on requirement.

### **Programming/ Output Based Questions:**

1. Consider the following ANSI C program;

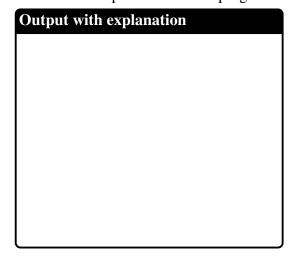
What is the output of the above program?

Output with explanation

2. Consider the following ANSI C program;

```
#include <stdio.h>
int a, b, c = 0;
void prtFun(void);
int main()
{ static int a = 1; /* Line 1 */
        prtFun();
        a+=1;
        prtFun();
        printf("\n %d %d ", a, b);
        return(0);
void prtFun(void)
{ static int a = 2; /* Line 2 */
        int b = 1;
        a + = ++b;
        printf(" \n %d %d ", a, b);
}
```

What is the output of the above program?



3. Consider the following ANSI C program;

```
#include <stdio.h>
int a, b, c = 0;
void prtFun(void);
int main()
{ auto int a = 1; /* Line 1 */
        prtFun();
        a+=1;
        prtFun();
        printf("\n %d %d ", a, b);
        return(0);
}
void prtFun(void)
{ register int a = 2; /* Line 2 */
        int b = 1;
        a + = ++b;
        printf(" \n %d %d ", a, b);
}
```

4. What is printed by the following ANSI C program?

```
#include<stdio.h>
int f(int n, int k) {
        if(n==0) return 0;
        else if(n%2) return f(n/2, 2*k)+k;
        else return f(n/2, 2*k)-k;
}
int main() {
        printf( "%d",f(20,1));
        return 0;
}
```

5. What is printed by the following ANSI C program?

What is the output of the above program?

Output with explanation	

[GATE 2005]

[GATE 2007]

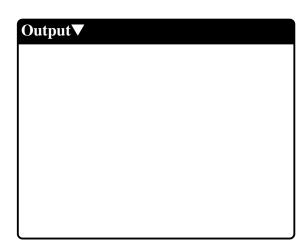
	[GATE 2007
Output with explanation▼	

6. What is printed by the following ANSI C program?

```
#include<stdio.h>
unsigned int foo(unsigned int n, unsigned int r)
{
      if(n>0) return((n%r)+foo(n/r,r));
      else return 0;
}
int main()
{
      printf("%d\n", foo(345,10));
      return 0;
}
```

[GATE 2011]

7. What is printed by the following ANSI C program?



**Output ▼** 

8. Consider the program below;

```
#include<stdio.h>
int foo(int a) {
        if ( a == 0 || a == 2) return 1;
        return (foo(--a) * (a--));
}
int main()
{
        printf("%d\n",foo(4));
}
```

**Output** 

9. Consider the following C program

```
#include<stdio.h>
int main() {
    register int a =10;
    int *ptr = NULL;
    ptr = &a;
    *ptr = 5;
    printf("%d",*ptr);
    return(0);
}
```

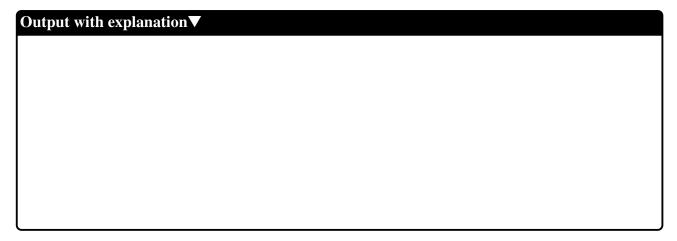
Find the error in the program with proper reasoning

Output▼			

10. Consider the following C function;

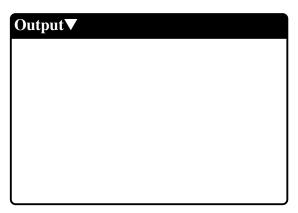
file2.c

Find the output if "file2.c" is compiled and executed:



11. Write the output of the following program;

```
#include<stdio.h>
int i=5;
int main()
{
        extern int j;
        printf("\ni=%d \nj=%d",i,j);
        int j=10;
        return 0;
}
int j =10;
```

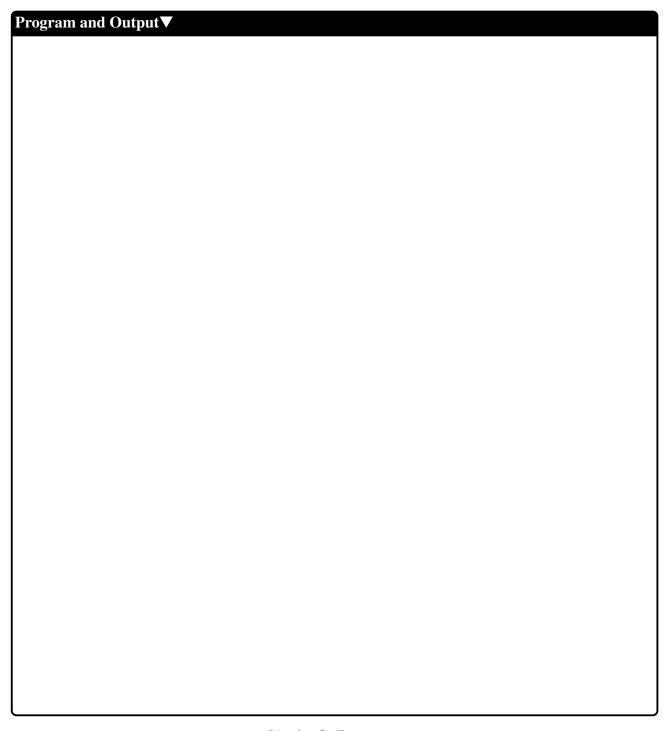


12. Find the output and different types of pointer involved in the code snippet;



13.	Write a program to find the sum of an array elements using recursion.
	Program and Output▼

14. Write a program to print "n" Fibonacci numbers using recursion.[N.B: The program format should be as follows]



15.	Write a program to print the binary equivalent of a Decimal number using recursion.
	Program and Output▼

16.	Write a program to remove adjacent duplicate characters from a string using recursion.
	Program and Output▼

17.	Write a program to find the sum of a geometric sequence using recursion.
	Program and Output▼

Write a recursive function that takes n words as input and print them in reverse order on separate lines. The prototype of the function should be as follows:  void reverse_input_words(int n);
Program and Output▼