

CODE A

**Time:1 hours**

**Mid Semester Exam-II: MTH409**

**Full Marks 50**

1. The *recursive* C function

```
int sum3(int n)
```

returns the sum  $1^3 + 2^3 + \dots + n^3$ . Complete the details of the above function. [8]

2. Write down the output of the following program. Explain your answers pictorially or otherwise. [12]

```
#include <stdio.h>
int main( )
{int a[3][4],i,j;
for(i=0;i< 3;i++)
    for(j=0;j<4;j++)
        a[i][j]=i+2*j;
printf(“%d %d %d \n”,*a[2]+2,*a[2]+2,*a[1]+6);
printf(“%d %d %d \n”,*(a+3),*(a+3),(&a[1][3]+5));
}
```

3. Write down the output of the following program. Explain your answers pictorially or otherwise. [10]

```
#include <stdio.h>
int main( )
{int x=2,*p=&x,**q=&p,y[10],i;
for(i=0;i<10;i++)
y[i]=i+1;
**q=4;
printf(“%d %d %d \n”,x,*p,**q);
*q = &y[3];
printf(“%d %d %d \n”,x,*p,**q);
printf(“%d %d \n”,y[2],4[y]+2);
}
```

4. Complete the details of the program given below at the appropriate places (see the comment parts of the program). The program calculates the average mark, maximum mark and the location of the maximum mark using a single function in an array of random marks. Remove the comments part in the program you write. [12]

```
#include <stdio.h>
/* Write the prototype of the function here */

int main( )
{int n,m,i,maxm,mark[100];
float avg;
n=30; /* n denote the actual number of marks*/
for(i=0;i<n;i++)
    mark[i]=random()%101;
/* Write the statement which calls the function here*/

/* After the call to the function, avg contains the average mark, maxm
and m contain the maximum mark and its location respectively*/

printf(“Average mark=%0.2f\n”,avg);
printf(“maximum mark=%d location=%d \n”,maxm,m);
}

/* Write the details of the function here*/
```

5. Write a C function (do not write the complete program) which takes an integer (greater than 1) as argument, and returns the highest power of that integer which is less than 1000.

[Examples: For argument 2, your function should return 512 (since  $2^9 = 512 < 1000$  but  $2^{10} > 1000$ . Similarly for argument values 3 and 1234, your function should return 729 and 1] [8]