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2011.1 C Programming
Midterm Exam [4/25 5pm-6:20pm(80minutes)]

Student Id. : (_____) , Name : (_____)

※ You may use either Korean or English for your answer.

1. (20points) Write a C function `int f(int n)` that returns $f(n) = \sum_{k=1}^n k^2 = 1^2 + 2^2 + \dots + n^2$.

```

/* input parameter: integer n, return value:  $\sum_{k=1}^n k^2 = 1^2 + 2^2 + \dots + n^2$  */
int f(int n)
{
    // Write your C code in this box.
}

#include <stdio.h>

int f(int);
int main()
{
    int x , square_sum

    scanf("%d",&x);
    square_sum=f(x);
    printf("%d \n",square_sum);
    return 0;
}

```

2. (15 points) You can see a C program and its output results as follows.

Fill out the blanks (1), (2), (3) in the following C program.

```

#include <stdio.h>
int main()
{
    int i,j;
    for ( (1) _____ ) {
        for ( (2) _____ ) printf(" ");
        for ( (3) _____ ) printf("***");
        printf("\n");
    }
    return 0;
}

```

Output :

```

*****
*****
****
***
*

```

3. (20 points) Write a C program that reads a five-digit integer and prints the sum of its digits as an output.

```

#include <stdio.h>
int main()
{
    int num;
    scanf("%d",&num); // reads a five-digit integer.

```

```

// Write your C code in this box.

return 0;
}

```

Input Example :
42156
Output Example:
18

4. (10points) What are the values of x and y after executing following statements.

(1)

```
int x=8 , y=6;
x *= 3 - (--y)/3;
```

(Answer: x= , y=)

(2)

```
int x=2, y=3;
x *= (11>>1) - (y++);
```

(Answer: x= , y=)

5. (10 points) When we execute following C program, what will be printed by **printf** function?.

()

```
#include <stdio.h>
int main()
{
    short x=0x3b;
    short y=38;
    printf("%d , %d , %d\n", x & y , x | y , y<<2);
    return 0;
}
```

6. (12points)

(1) What is "compile"? Explain. :

()

(2) What is "Operator Associativity"? Explain :

()

(3) What is the main advantage of using "function" in C? Explain :

()

(4) Explain the difference between "global variable" and "local variable".

()

7. (13points) What does following C program print as an output?

()

```
#include <stdio.h>

int main()
{
    int x=1, i=1;
    while (x<=500) {
        x *= 2;
        i++;
    }
    printf("i:%d\n",i);
    return 0;
}
```