

CMPE 108 Study Questions for Midterm Exam

PRECEDENCE AND ASSOCIATIVITY (Use the table below where necessary)

OPERATORS	ASSOCIATIVITY
() [] -> .	Left to right
! ++ -- + - * & (type)	Right to left (Unary)
* / %	Left to right
+ -	Left to right
< <= > >=	Left to right
== !=	Left to right
&&	Left to right
 	Left to right
?:	Right to left
= += -= *= /= %=	Right to left
,	Left to right

Q1) (10 points) State which of the following C identifier names are valid or invalid. Give reason if invalid.

Identifier name	Valid or Invalid	Reason (if invalid)
salary		
Total 10		
_sum		
money\$		
5digit		

Q2) (10 points) Rewrite the following mathematical formulas as correct C expressions.

a) $xy + \frac{z^2}{a+3}$

b) $1 + \frac{1}{1 + \frac{1}{n+1}}$

c) $m - \frac{2}{k(n+3)}$

Q3) (8 points) Given the following declarations:

```
int k=1, m=50, n=10, p=5;
```

Evaluate each of the following expressions and write the answer in the box provided.

a) $n / p + 3$

Ans:

b) $m / p + n - 10 * k$

Ans:

c) $m - 3 * n + 4 * k$

Ans:

d) $(m + n) / (p + k)$

Ans :

Q4) (12 points) Given the following declarations:

```
int i=5, j=7, k=12, z=0, a=5, b=2, c=4, d=6;
```

```
char ch2= 'b', ch3='B';
```

Evaluate each of the following expressions and write the answer in the box provided

a) $i + 2 == k - 1$

ANS:

b) $i + 2 * j > k$

ANS:

c) $k + 3 <= -j + 3 * i$

ANS:

d) $ch2 != ch3 == z$

ANS:

e) $d \% b == c \% b$

ANS:

f) $a \% b * c || c \% b * a$

ANS :

Q5) (12 points) Given the following numbers and format specifiers show what will be displayed (output) in each case shown in the table below.

(note: each '_' shows a space for one character)

Number	Specifier	Display (output)
34	%d	-----
34	%4d	-----
125	%d	-----
2.366	%f	-----
2.366	%7.3f	-----
2.366	%5.2f	-----
142.361	%5.2f	-----
44.1	%5.1f	-----

Q6) (12 points) The following C program contains 6 errors. Find each error and show it by putting a circle around it. (i.e. circle only the exact location of the error, you do not need to correct the errors, you will lose -1 point for each wrongly identified error)

Example: flotx;

```
#include <stdio.h>

#define x=15

int main ()
{
    int age
    char initial;
    printf ( please enter your age");
    scanf ( "%d", age);
    printf ("\nplease enter the first letter of your name");
    scanf ("%c", &initial);
    printf ("\n your initial is %c and \n you are %d years
            old", initial age);
    return 0;
}
```

Q7) (10 points) The following C program reads two integer values "num_1" and "num_2" from the keyboard and computes sum of the two numbers as well as the remainder of dividing num_1 into num_2. Complete the missing parts (you can write only 1 statement on each blank line)

Example: If num_1=15 and num_2=10, then sum= 25 and remainder= 5

```
#include <stdio.h>

int main()
{
    int num_1, _____;
    int _____, remainder;

    /*read two integers from the keyboard*/
    _____;

    /*compute the sum of the two numbers */
    _____;

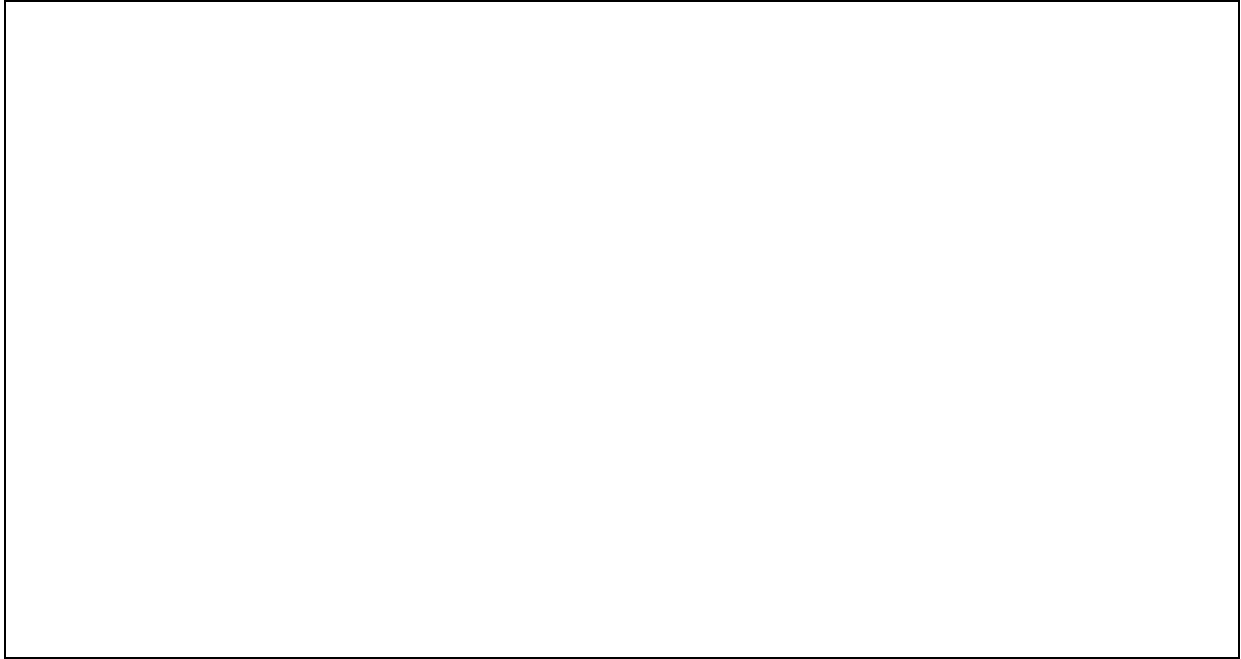
    /*compute the remainder */
    _____;

    /*display the result onto the screen*/
    _____;

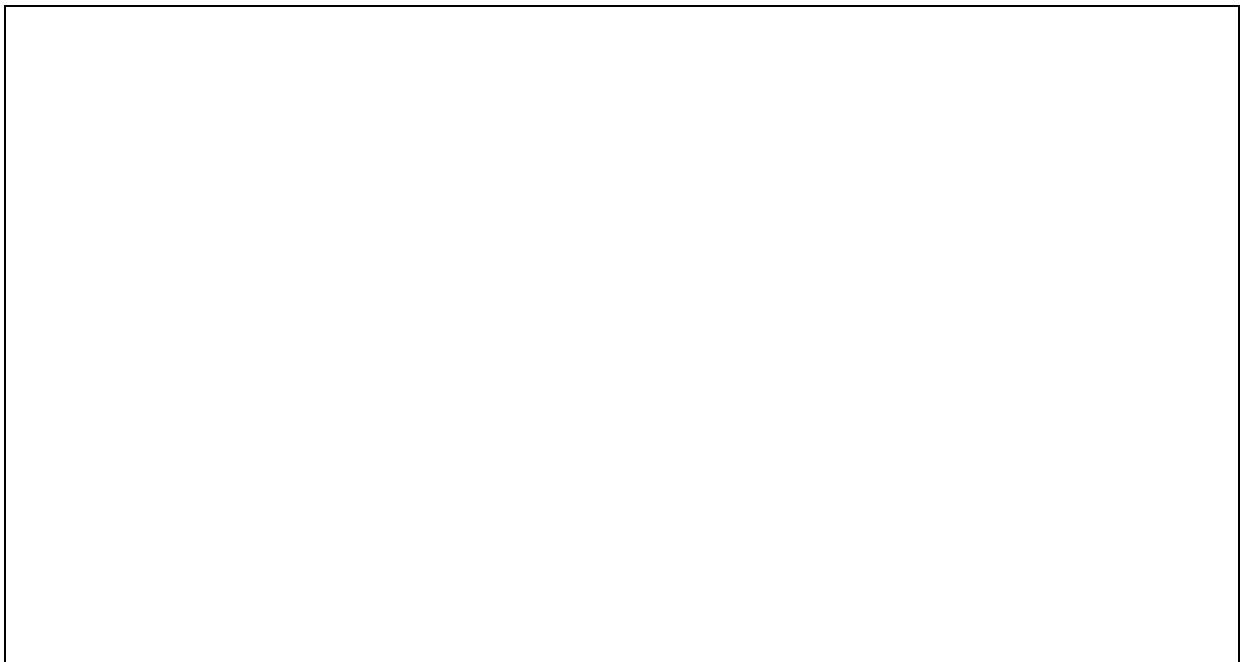
    return 0;
}
```

Q8) (26 points) Write an algorithm and draw a flowchart which reads two numbers x_1 and x_2 and finds and prints the maximum of the two numbers.

Algorithm:



Flowchart:



Q9) (10 points) State which of the following C identifier names are valid or invalid. Give reason if invalid.

Identifier name	Valid or Invalid	Reason (if invalid)
sUm		
float		
num1+num2		
Total_avg		
digit5		

Q10) (10 points) Write the mathematical formulas for the following C expressions:

a) $x*y/2+z/(n+1)$

b) $n/(n+1/n+1/(n-1))$

Q10) (8 points) Given the following declarations:

```
int k=1, m=50, n=10, p=5;
```

Evaluate each of the following expressions and write the answer in the box provided.

a) $n / p + 3 \% p$

Ans:

b) $m \% p * n + k / m$

Ans:

c) $(m - 3) * n / 4 + k$

Ans:

d) $m + n / p + k$

Ans :

Q11) (12 points)

Given;

```
int a=123, b=8;
```

```
float x=78.456, y= -45.1;
```

```
char ch='A';
```

Write one printf () statement for each line shown below such that the output shown can be printed.
(note: each '_' shows a space for one character)

ANSWER:

```
__ 123 _____
```

```
-45.10 _____
```

```
__ 78.46 __ A _____
```

```
_____
```

```
_ 8 _ 8 _ 8 _____
```

```
-45.10000078.456 _____
```



Q12) (10 points) The following C program reads two coordinates (x1,y1) and (x2,y2) from the keyboard and finds the midpoint of the straight line joining the two points. Complete the missing parts (you can write only 1 statement on each blank line)

Hint: The midpoint a straight line (xm , ym) connecting two points is given by $\left(\frac{x_2 - x_1}{2}, \frac{y_2 - y_1}{2}\right)$

```
#include <stdio.h>

int main()
{
    int x1, y1, x2, y2, xm , ym;

    /*read the first coordinate from the keyboard*/
    _____;

    /*read the second coordinate from the keyboard*/
    _____;

    /*find the x-coordinate of the midpoint */
    _____;

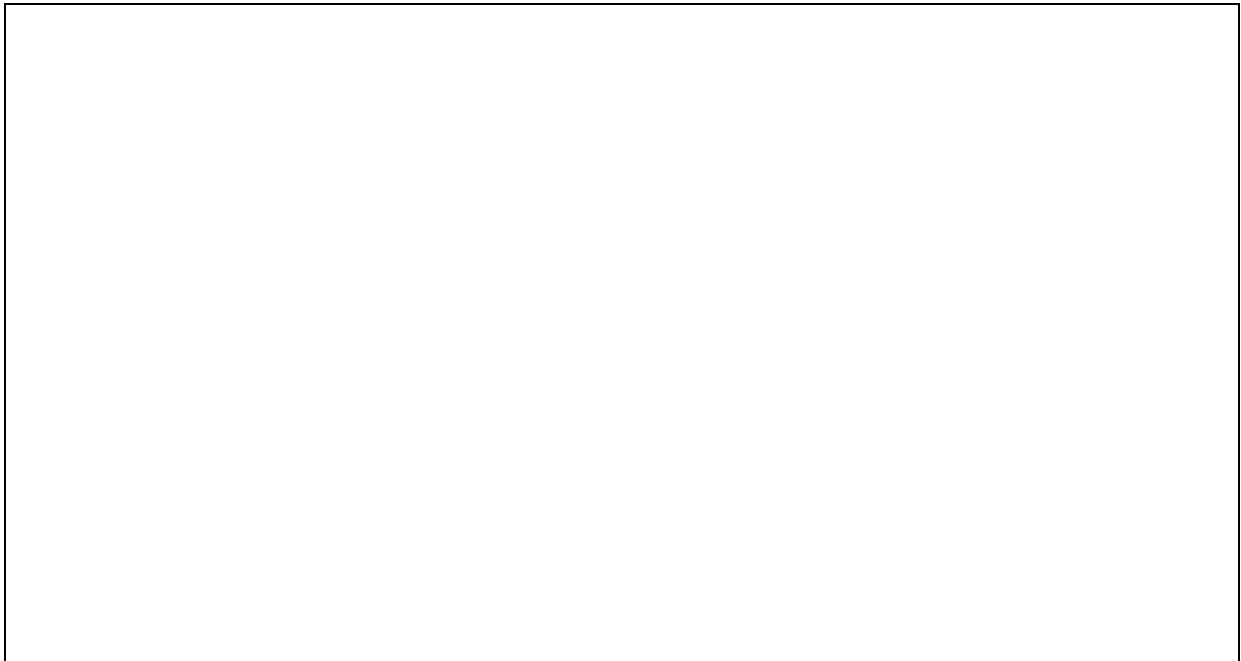
    /* find the y-coordinate of the midpoint */
    _____;

    /* Display the midpoint on the screen */
    _____;

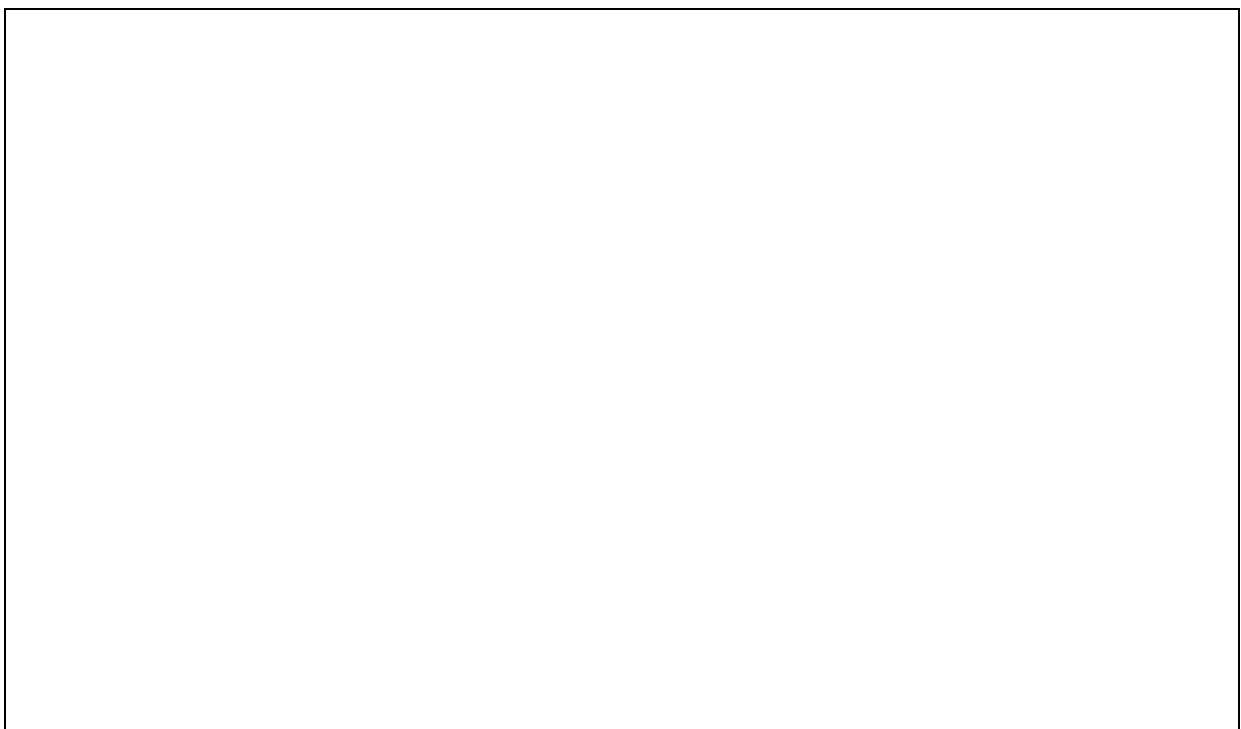
    return 0;
}
```

Q13) (26 points) Write an algorithm and draw a flowchart which asks the user to enter three numbers x_1 , x_2 , and x_3 and finds and prints the maximum of the three numbers. (Assume that three numbers cannot be equal)

Algorithm:



Flowchart:



Q.14) (14 points) Compute the value of the following C expressions assuming that a, b and c are integer variables and d is a float variable as declared below.

```
int a=1, b=2, c=3;
```

```
float d=4.0
```

a) $c > b > a$ _____

b) $d+a / b$ _____

c) $a \&\& b - c$ _____

d) $--a \ || \ c - 3$ _____

e) $b / c / d$ _____

f) $a-b-c \ || \ c==a/b$ _____

g) $a < b \ || \ b < c \ \&\& 0$ _____

Q.15) (9 points) The following C program reads two integer values "numOne" and "numTwo" from the keyboard and computes the value of the expression $(2.5 + \frac{numOne}{numTwo})$. Complete the missing parts.

Example: If numOne=5 and numTwo=10, then $expr = 2.5 + 5/10 = 3.0$

```
#include <stdio.h>
```

```
int main()
```

```
{
```

```
    int numOne, numTwo;
```

```
    float expr;
```

```
    /*read two integers from the keyboard*/
```

```
    _____
```

```
    /*compute the value of the expression*/
```

```
    _____
```

```
    /*display the result onto the screen*/
```

```
    _____
```

```
    return 0;
```

```
}
```

Q.16) (8 points) For the following statements, give the corresponding outputs.

a) `printf("%d%d", 3,5);` _____

b) `printf("%c cc %c", 'a', 'b');` _____

c) `printf("%3.2f", 3/5);` _____

d) `printf("%3.1f", (float)(3/5));` _____

Q.17) (15 points) Assume that the income tax is calculated as follows: if the income is larger than 3000TL, the tax is calculated as 3.5% of the income. The tax is 2% otherwise.

a) Give an algorithm that

1. Prints the purpose of the algorithm
2. Read the income from the keyboard
3. Calculates the tax
4. Displays the result on the screen

b) Draw the flowchart of your algorithm