EnEE 140, Spring 2015
Midterm Exam — Answer Key

Do Not Make a Copy!!

<table>
<thead>
<tr>
<th>Question</th>
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<td>1</td>
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<td>10</td>
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<td>7</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
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</table>
Problem 1. (14 points)

1. $a$ is implicitly casted into a float, multiplied by $e$, and then the result is implicitly casted into an int and assigned to $c$.
2. $a$ is explicitly casted into a float, and then $b$ is implicitly casted into a float, and then the product is implicitly casted into an int and assigned to $c$.
3. $d$ is explicitly casted into an int, and then implicitly casted back into a float, and then multiplied by $e$, and then the result is assigned to $f$. 

Answer Key—Do Not Make a Copy!!
### Problem 2. (24 points)

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>float r1 = c/d;</td>
<td>0.5</td>
</tr>
<tr>
<td>int r2 = a/b;</td>
<td>3</td>
</tr>
<tr>
<td>int r3 = a%b;</td>
<td>2</td>
</tr>
<tr>
<td>float r4 = a/b;</td>
<td>3.0</td>
</tr>
<tr>
<td>int r5 = (c+d) / 2 + 0.5;</td>
<td>2</td>
</tr>
<tr>
<td>int r6 = UINT_MAX - 1;</td>
<td>-2</td>
</tr>
<tr>
<td>int r7 = (a - r3) % b;</td>
<td>0</td>
</tr>
<tr>
<td>int r8 = r3 % b;</td>
<td>2</td>
</tr>
<tr>
<td>int r9 = (UINT_MAX % 2 + 1) % 2;</td>
<td>0</td>
</tr>
</tbody>
</table>
Problem 3. (5 points)
Answer:

```c
char function1(int i) {
    char r = 'a'+i-1;
    return r;
}
```
Problem 4. (15 points)

Answers:

a.

```c
for (i = 1; i <= 9; i++) {
    sum = sum + i;
    if(i < 9) {
        printf("%d + ",i);
    } else {
        printf("%d = %d",i,sum);
    }
}
```

b.

```c
i = 1;
while (i<=9) {
    sum = sum + i;
    if(i < 9) {
        printf("%d + ",i);
    } else {
        printf("%d = %d",i,sum);
    }
    i++;
}
```
**Problem 5. (12 points)**
There are two possible answers:

```c
#include <stdlib.h>

int main()
{
    int i,j;
    int max;

    scanf("%d",&max);

    for(i=0;i<max;i++) {
        for(j=0;j<=i;j++) 
        {
            printf("*");
        }
        printf("\n");
    }
}
```

```c
#include <stdlib.h>

int main()
{
    int i,j;
    int max;

    scanf("%d",&max);

    for(i=1;i<max;i++) {
        for(j=1;j<=i;j++) 
        {
            printf("*");
        }
        printf("\n");
    }
}
```
Problem 6. (10 points)
The answer should be:

```
int x;
x=rand()%8;  // random number from 0 to 7
x=2*x+2;   // random even number from 2 to 16
```

OR

```
x = (rand() % 8 + 1) * 2;
```
Problem 7. (20 points)
The correct implementation is listed below:

```c
#include <stdio.h>

int day_of_week(int days_since_new_year); // SHOULD BE BEFORE main()
// MISSING ;

int main()
{
    int days, wd;

    printf("Enter number of days since January 1, 2015: ");
    scanf("%d", &days);
    wd = day_of_week(days);
    if (wd < 5) { // < INSTEAD OF <=
        printf("Weekday\n");
    } else {
        printf("Weekend\n");
    }
    return 0;
}

// Returns 0 for Monday, 1 for Tuesday, ...
int day_of_week(int days_since_new_year)
{
    int thursday_offset = 3;
    return (thursday_offset + days_since_new_year) % 7; // MISSING return
    // % INSTEAD OF /
}
```