

**Midterm Exam #1****Example Problems**

1. Given the following variables, evaluate each C statement and write its answer.

**Note: use 1 for True, 0 for False**

int x = 5, y = 15, z = 22;

int result;

result = (x < y) && !(x > z);

result = 1

result = (x > y) || (x > z);

result = 0

result = z%4 + y/4;

result = 5

2. Given the followings, what get printed?

```
#include <stdio.h>
int main(void){
    int x = 1;
    if (x >= 0)
        x = 2*x;
    else if (x >= 2)
        x = 4*x;

    printf("x = %d\n", x);
    return 0;
}
```

Your answer: x = 2

```
#include <stdio.h>
int main(void){
    int y = 1;
    if (y >= 0)
        y = 2*y;
    if (y >= 2)
        y = 4*y;

    printf("y = %d\n", y);
    return 0;
}
```

Your answer: y = 2

3. Given part of a program, answer the following 4 questions:

```
int x;  
for(x =10; x > 0; x = x - 3)  
{  
    printf("$");  
}  
printf("x value = %d", x);
```

3a) How many "\$" will get printed? 4

3b) What is the value of x at the last printf statement?

x value = -2

3c) Which for loop given below will print **3** dollar signs (\$) ? (circle one answer)

- a) for(x = 0; x < 5; x = x + 3)
- b) for(x = 1; x < 5 ; x = x \* 2)
- ☒ c) for(x = 0; x != 5; ++x)
- d) for(x = 100; x < 105; x = x - 1)
- e) None of the above

3d) Rewrite the *for* loop below using **while** loop

```
int x;  
for(x =10; x > 0; x = x - 3)  
{  
    printf("$");  
}
```

```
int x;  
x = 10;  
while (x > 0) {  
    printf("$");  
    x = x -3;  
}
```

4. What will get printed by the following program?

```
#include<stdio.h>
void do_func(int x, int y){
    y = (x%2 == 0);
    x = x/2+1;
}
int main(void){
    int x = 20,y = 9;
    do_func(x, y);
    printf("x = %d and y = %d\n", x, y);
    return 0;
}
```

Write your answer here

**x = 20 and y = 9**

5. What will get printed by the following program?

```
#include<stdio.h>
int do_func(int x, int y){
    y = (x%2 == 0);
    x = x/2+1;
    return(x);
}
int main(void){
    int x = 20,y = 9;
    x = do_func(x, y);
    y = do_func(100, y);
    printf("x = %d and y = %d\n", x, y);
    return 0;
}
```

Write your answer here

**x = 11 and y = 51**

6. Given the program below, answer the questions below.

```
#include <stdio.h>
int main(void){
    char letter;
    printf("Enter a character: ");
    scanf("%c", &letter);
    if (letter >= 'a' && letter <= 'z')
        printf("%c%c\n", letter, letter - 32);
    else if (letter >= 'A' && letter <= 'Z')
        printf("%c%c\n", letter, letter + 32);
    else
        printf("%c\n", letter);
    return(0);
}
```

a) What get printed if a user enters g  
(letter = 'g')?

**gG**

b) What get printed if a user enters \$  
(letter = '\$')?

**\$**

7. Given the following program, what will get printed?

```
#include <stdio.h>
int main(void)
{
    int i, j, n = 5;
    char a = 'A';
    for (i = 1; i <= n; i++)
    {
        printf("B");
        if (i == n){
            a = 'B';
        }
        for (j = 2; j < i; j++){
            printf("%c", a);
        }
        if (i != 1){
            printf("B");
        }
        printf("\n");
    }
    return 0;
}
```

Write your answer here

**B**  
**B**  
**B**  
**BBB**

8. What is the output of this code segment?

```
for (k = 5; k > 0; k = k - 1) {
    for (i = 1; i <= 5 - k; i++)
        printf(".");
    for (j = 1; j <= 2 * k - 1; j = j + 1)
        printf("B");
    printf("\n");
}
```

Write your answer :

9. Complete the given incomplete program below such that it yields the output shown in the box on your right-hand side.

```
#include <stdio.h>
int main(void){
    char letter;
    //declare variables here
```

The output from the code:

```
A1 A2 A3 A4 A5
B1 B2 B3 B4
C1 C2 C3
D1 D2
E1
```

```
    for (letter = 'A'; letter <= 'E'; letter++){
        //write your code (hint: loop should be used)
```

```
        printf("\n");
    } //for
    return 0;
}
```

10. Write a C **user-defined function** that accepts three input arguments: real-valued  $a$ ,  $b$  and angle  $d$  (in degrees) and returns value of  $c$  from

$$c = \sqrt{a^2 + b^2 - 2ab\cos(d)}$$

Note: double or float should be used.

11) What are the values of R, L, and J when the program ends? Write the values of R, L, and J next to each line of code to receive partial credit!

```
#include <stdio.h>

int main(void) {
    float R = 10.0, L = 2.0, J = 5.0;
    float *ptr;

    ptr = &R;
    *ptr = *ptr + 10 - J;

    ptr = &J;
    *ptr = *ptr - 9;

    ptr = &L;
    *ptr = *ptr + R + (*ptr)*4 - J;

    J = R+L;
    return 0;
}
```

12) What are the values of a, b, c, and d when the program ends? Write the values of a, b, c, and d next to each line of code to receive partial credit!

```
#include <stdio.h>

int funp(int x, int *y, int *z) {
    *z = *z + x + *y;
    (*y)++;
    x = x + 2*(*y-2) + *z;

    return 2*x;
}

int main(void) {
    int a = 1, b = 2, c = 3, d;

    d = funp(a, &b, &c);

    return 0;
}
```

13. Given the following program, answer the questions:

```
#include<stdio.h>
int main(void){
    FILE *ifile;
    double prc;
    ifile = fopen( ____ A ____ );

    if(ifile == NULL){
        printf("the file does not exist\n");  }
    else{
        ____ B ____ {
            if (prc >= 10 && prc < 20)
                printf("%.2lf ", prc);
        }
    }
    fclose(ifile);
    return 0;
}
```

13a) Complete the C statement at **A** \_\_\_\_\_  
to open "**input.txt**" to *read*.

13b) If the **input.txt** is *not* in the appropriate folder, how does this program handle it (i.e. what it will do)?

13c) Complete the statement at **B** such that *one number can be read in, from the input.txt file, at a time* until the end of file.