

**King Fahd University of Petroleum and Minerals
Information and Computer Science Department
ICS 103: Computer Programming in C
Spring Semester 2007-2008 (Term-072)
Major Exam-I**

Time:100 minutes

Saturday, March 22, 2008

Name:

ID#:

--	--	--	--	--	--

PLEASE CIRCLE YOUR SECTION BELOW:

Section	01	02	03	04	05	06
Time	SM-8-9	SM 9-10	SM 11-12	UT 10-11	UT 11:12	UT 10-11

Note:

- Copying or Discussion will result in **zero grade** for all the students involved.
- Attempt all questions.

Question #	Maximum Marks	Obtained Marks
1	$16 \times 1.5 = 24$	
2	6	
3	6	
4	6	
5	10	
6	8	
7	6	
8	16	
9	18	
Total	100	

Question 1: (24 points 1.5 each expression)

Find the values of the following expressions.

expression	Value
5>6-2	
1!=1<=1	
10<=7<=5	
7<10<=10-5	
1 !1&&0	
6 != 3 != 1	
-8<-4<0	
(double)(9/2)	
3*4-6/2.0	
-4+4*3%5	
3%5*5	
21/6*6.0	
11+1/2.0	
10/(int)2.5	
3-2 1==2%3	
! 3<3+1&&0<2-2	

Question 2 (6 points)

What is the output of the following program

```
#include <stdio.h>
int main(void) {
    int x,y,z;
    x=20;z=30;
    if(0<=x<=10)
        printf("in\n");
    else
        printf("out\n");
    if( x==10)
        z=40;
    else
        z=10;
    printf("%d,%d",x,z);
    return 0;
}
```

Question 3 (6 points)

Find the equivalent expression on each side

expression	Equivalent expression without brackets
$!(!a \mid \mid !b)$	
$!(a > d \ \&\& \ !(a > c))$	
$!(\quad)$	$a == b \mid \mid c > d$

Question 4 (6 points)

What will be the values of x, y, and z after executing the following statements.

```
int x=-9.666;
double y=x;
double z=x/3;
```

x

y

z

Question 5 (10 points)

What is the output of the following program

```
#include <stdio.h>
int main() {
    int x;
    printf("Enter a value for x >");
    scanf("%d",&x);
    if(x > 5) {
        if(x< 10){
            if(x>=8)
                printf("A");
            else
                printf("B");
        }
        else{
            if ( x >= 0)
                printf("C");
            else
                printf("D");
        }
    }
    else
        printf("E");
    return 0;
}
```

Value of x typed By user	Program output
3	
7	
9	
10	
-2	

Question 6 (8 points)

```
#include <stdio.h>
int main() {
int x;
printf("Enter a value for x >");
scanf("%d", &x);
switch(x) {
    case 6: x=x+2;
    case 5: x=x-1;
        if(x==4)
            break;
    case 3: x=x-2;
        break;
    case 2: x=x-1;
    default : x=10;
}
printf("%d\n",x);
return 0;}
```

Value of x typed By user	Program output
6	
5	
3	
2	

Question 7 (6 points)

Given the following program. Write 2 printf statements to have the output shown below the program. Each square represents one space.

```
#include <stdio.h>
int main(void) {
double z= 623.782;
int i=917;
```

```
return 0;
}
```

	9	1	7		6	2	3	.	8					
	6	2	3	.	7	8	2	0				9	1	7

Question 8 (16 points)

Write a program that converts a distance from miles to kilometers or from kilometers to miles. Your program should give two options to the user.

If the user types 1, then the program will ask for a distance in miles and converts it to kilometers.

If the user types 2, then the program will ask for a distance in kilometers and converts it to miles.

If the user types another number, the program will display an error message.

1 mile=1.609 kms. The conversion factor from mile to kilometer needs to be declared as a constant.

Use switch statement.

Samples of your program runs are shown below:

```
(Inactive C:\TCWIN\BIN\NONAME00.EXE) Enter your choice: 1 (miles to kms) or 2(kms to miles) >1 Enter distance in miles >10.5 10.500000 miles = 16.894500 kilometers
(Inactive C:\TCWIN\BIN\NONAME00.EXE) Enter your choice: 1 (miles to kms) or 2(kms to miles) >2 Enter distance in kilometers >12.45 12.450000 kilometers=7.737725 miles
(Inactive C:\TCWIN\BIN\NONAME00.EXE) Enter your choice: 1 (miles to kms) or 2(kms to miles) >3 Sorry your choice must be 1 or 2
```

Question 9 (18 points)

Write a program that asks the user for a code character and a radius. The code character can be:

A or a to compute and display the area of the circle

C or c to compute and display the circumference of the circle

D or d to compute and display the diameter of the circle

$$area = \pi r^2$$

$$circumference = 2\pi r$$

$$diameter = 2r$$

Use if-else-if statement

The screenshot shows four separate terminal windows, each with its own title bar and scroll bars. The windows are arranged in a grid-like fashion.

- Top-left window:** Title bar says "(Inactive C:\TCWIN\BIN\NONA...)"
Content: "Enter code and radius >A 5.7"
Output: "area=102.070259"
- Top-middle window:** Title bar says "(Inactive C:\TCWIN\BIN\NONA...)"
Content: "Enter code and radius >c 20.5"
Output: "circumference=128.805190"
- Top-right window:** Title bar says "(Inactive C:\TCWIN\BIN\NONA...)"
Content: "Enter code and radius >d 42.7"
Output: "diameter=85.400000"
- Bottom-left window:** Title bar says "(Inactive C:\TCWIN\BIN\NONA...)"
Content: "Enter code and radius >R 12.56"
Output: "Sorry you entered wrong code"