**King Fahd University of Petroleum and Minerals**

**Information and Computer Science Department**

ICS 103: Computer Programming in C

**Spring Semester 2009-2010 (Term-092)**

##### Major Exam-I

**Time:100 minutes Thursday, March 25, 2010**

|  |  |
| --- | --- |
| **Name:** |  |
| **ID#:** |  |  |  |  |  |  |  |  |  |  |

PLEASE CIRCLE YOUR SECTION BELOW:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Section | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 |
| Instructor | Balah | Darwish | Balah | Darwish | Darwish | Bouche-khma | Balah | Bouche-khma | El-Maleh |
| Time | UT-7-8 | SM-7-8 | UT 9-10 | SM 9-10 | UT 1:10-2 | SM 1:10-2 | UT 8-9 | SM 8-9 | UT 9-10 |

|  |  |  |
| --- | --- | --- |
| Question # | Maximum Marks | Obtained Marks |
| 1 | 10x2 =20 |  |
| 2 | 8 |  |
| 3 |  15 |  |
| 4 |  6 |  |
| 5 | 9 |  |
| 6 |  10 |  |
| 7 | 14 |  |
| 8 | 18 |  |
| Total | 100 |  |

 **Notes.** 1. Make sure you have **Seven** pages including the cover page.

 2. Closed book and notes

 3. Write clearly, briefly and precisely

 4. Cheating will result in ZERO grade

##  Good LuckQuestion 1: (20 points- 2 points each expression)

**Find the values of the following expressions.**

|  |  |
| --- | --- |
| expression | Value |
| !1 && 1 |  |
| (double) (11/4) |  |
| 11\*2>15+4 |  |
| 335%100%3 |  |
| 4 > 2 > 1 |  |
| !( 100/25 == 20/4)  |  |
| 1 != 7 > 0 |  |
| (int) 6.6/1.2 |  |
| 33.1+9/2\*4.0 |  |
| 7 && 10 > 8 |  |

**Question 2 (8 points)**

Consider the following program. What will be the output for the different values of x typed by the user.

#include <stdio.h>

int main() {

int x ;

|  |  |
| --- | --- |
| Value of x typedBy user | Program output |
| **4** |  |
| **2** |  |
| **5** |  |
| **15** |  |

scanf("%d",&x);

switch(x) {

 case 4:

 case 2: if(x==4)

 x=x-3;

 x=x+1;

 case 5:

 case 0: x=x+2;

 case 3:

 case 1: x=x+3;

 break;

 default : x=x+4;

 }

 printf("%d\n",x);

return 0;}

**Question 3 ( 9+6=15 points)**

Determine the output of the following programs for each of the input values entered by the user. If no output displayed, write “no output”

**I)**

#include <stdio.h>

int main(void)

|  |  |
| --- | --- |
| **User Input**  | **Program Output** |
| **12 13 14** |  |
| **8 25 10** |  |
| **5 30 40** |  |

{

 int a, b, c;

 scanf ("%d%d%d",&a ,&b,&c);

 if (a<10)

 if (b<20)

 printf("One\n");

 else if (c>a && c<b)

 printf("Two\n");

 else

 printf ("Three\n");

 return 0;

}

**II)**

#include <stdio.h>

int main(void)

|  |  |
| --- | --- |
| **User Input**  | **Program Output** |
| **6 4 4** |  |
| **0 0 0** |  |
| **2 2 1** |  |

 {

int a, b, c;

scanf ("%d %d %d",&a , &b, &c);

if (a==b==c)

 printf("The three numbers are equal \n");

else if (a==b)

 printf ("First and second are equal \n");

else if (a = c)

 printf ("First and third are equal \n");

return 0;

}

**Question 4 (6 points)**

Show the output of the following program in the space provided below it. Each square corresponds to one space.

#include <stdio.h>

#include <math.h>

int main(void) {

double i=-99.999;

 printf("%5.0f%8.2f\n",i,i);

 printf("%5d%7.1f\n",(int)i,fabs(i));

return 0;

}

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Question 5 (9 points )**

**Write the corresponding mathematical or C expression.**

**All variables are of type double.**

|  |  |
| --- | --- |
| **C EXPRESSION** | **Mathematical Expression** |
|  |  |
| **sqrt(fabs(5-x)+y)/x+y** |  |
|  |  |

**Question 6 (10 points )**

**Consider the following flowchart. It is implemented using simple if statements (if without else or else if). Put the right condition for each of the if statements so that the corresponding message is printed.**

**Note: Write the minimum number of conditions for each case; for example a>60 and a> 100 has to be written as a>100 only.**

**a>=70**

**a < 30**

**false**

**true**

**“outside”**

**a<50**

**“low”**

**“medium”**

**false**

**a<90**

**“very high”**

**“high”**

**true**

**false**

**true**

**true**

**false**

if( )

 printf("medium");

if( )

 printf("high");

if( )

 printf("low");

if( )

 printf("very high");

if( )

printf("outside");

**Question 7 (14 points )**

Write a C program that will find and display the radius of a sphere given its area or volume.

The program will display 2 choices for the user for input. Once the user selects the choice, the program will ask for the input and finds and displays the sphere radius.

Define PI as a constant and use a value of 3.1416 for it.

 

Below are sample executions of the program.



**Question 8 (18 points )**

# Write a C program to do the following:

## Ask the user to enter two real numbers and read them.

## Then, your program will display the following menu:

 Select an operation:

###  1. Addition

###  2. Multiplication

###  3. Power

## The user will select the operation by entering a number from 1 to 3. After that your program will

## display the entered numbers with the performed operation and the result up to two decimal places i.e. two digits after decimal point.

## If the selected operation is invalid, display “Invalid operation”.

*Sample executions of the program are shown below:*

  