

Name: key  
please print your name clearly

## EE 102-01 Exam No. 1 (100pts. - 25% of the final grade)

Do not use back side for answers. Back side of this test will not be graded. Attach more pages if necessary. Midterm progress grade will be calculated based on this exam (80%) and homework (20%)

**DL: 12 ERR: \_\_\_ PTS: \_\_\_ MPTS: \_\_\_ MGR: \_\_\_**

DL – exam difficulty level (adjustment), ERR – exam errors, PTS – exam points, MGR – total midterm points, MGR – total midterm grade.

### Problem 1 (10pts.)

Please answer the following **multiple-choice questions**. Only one answer should be correct. **Circle your selection**.

1.1. Which of these **is not** the C++ **keyword**? 2p

- a) void                      b) main                      c) for                      d) int                      e) if

1.2. Which of the following **cannot be used as an identifier** (variable, type or function name)? 2p

- a) X\_2                      b) X-2                      c) X2                      d) X2\_2                      e) X

1.3. Which of the following expressions **does not evaluate to 1 or 1.0**? 2p

- a) 1.0+3/2                      b) 6%5                      c) 6/5                      d) 1.0\*3/2                      e) 1

1.4. Which of the following expressions **is true** assuming double **x=1.00** and double **y=3.00**? 2p

- a) x==1&&y!=1                      b) x!=1&&y==3                      c) x!=1&&y==3.0                      d) x<1.0 || y>3.0                      e) 0

1.5. Assuming that neither a nor b were declared earlier, which of the following **is not correct** in C/C++? 2p

- a) int a=1, b=2; b) int a, b;                      c) int a, b;                      d) int a; b;                      e) int a; int b;

### Problem 2 (10pts.)

Please **evaluate the following expressions** assuming variables listed below are declared and initialized as shown:

int i1=1, i2=2, i4=4, i10=10; double d2=2, d4=4;

2.1.  $i1/i2/d4$  = 0 2p

2.2.  $i1/d2/i4$  = 0.125 2p

2.3.  $i1 >= 1.0$  = true 2p

2.4.  $i1 > i2 || i2 < i4$  = true 2p

2.5.  $\text{sqrt}(i4)/i10$  = 0.2 2p

Total errors this page: \_\_\_\_\_

**Problem 3 (10pts.)**

Answer following questions by writing in the answer or circling a correct one from among provided:

3.1. Each Windows and Linux **console type application** contains **at least one function** that is written by the programmer. **What is the name of that function?**

int main() OR void main() 5p

3.2. **Are variable names in C/C++ case sensitive?**

I.e. Is "int my; My=1;" incorrect or not?

yes - case sensitive - incorrect / no - case insensitive - correct 5p

**Problem 4 (10pts.)**

What are the values of **i, j, and k** after executing each fragment of C++ code? Please note that some cases may not be practical, and they were included to test your troubleshooting skills.

i=j=k=0;  
for (i=1; i<=30; i=i+1) { j=i; k++; }      i= 31 1p    j= 30 1p    k= 30 1p

i=j=k=0;  
for (i=0; i<=30; i=i+1) { j=i; k++; }      i= 31 1p    j= 30 1p    k= 31 1p

i=j=k=0;  
for (i=0; i>=30; i=i+1) { j=i; k++; }      i= 1 1p    j= 0 1p    k= 0 1p

and in addition 1p for all answers correct

**Problem 5 (10pts.)**

Please **complete the output produced by the following program.**

```
#include <iostream>                               /* RUNNING PROGRAM PRINTOUT
void F (int x) {                                   Inside F: 12 5p
    std::cout<<"Inside F: "<< x
    <<std::endl;
}                                                  Inside F: 13 5p
                                                  */
void main() {
    int x=11, y=12, z=13;
    F(y);
    F(z);
}
```

**Problem 6 (10pts.)**

Please **complete the output** produced by the following program **for various values of x entered at each run.**

```
#include <iostream>
using namespace std;
void main() {
double x; cin >> x;
if ( x>=-2 && x<2 )
cout<<"close"<<endl;
else
if (x>=-5 && x<5 )
cout<<"near"<<endl;
else
if (x>=-1 && x<1 )
cout<<"target"<<endl;
}
```

**What would be output** of the program, if any can be observed, if the **entered value for x** was:

4.1) -5      the output is: near 2p

4.2) -2      the output is: close 2p

4.3) -1      the output is: close 2p

4.4) 1        the output is: close 2p

4.5) 2        the output is: near 2p

Total errors this page: \_\_\_\_\_

**Problem 7 (10pts.)**

Write code for the **function, which calculates the following formula:**  $\frac{1}{4} \frac{q_1 q_2}{r^2}$  where variables used in the formula correspond to variables with familiar names passed to the function. Variables are provided by the program that call the function, the results are used by that program for further computations. Incorrect use of cin/cout will cost 50% of points.

```
double ElForce( double q1, double q2, double r )
{
    return(0.25*q1*q2/(r*r));
// 1/4 is 0 -2p, missing return -2p, error in formula -2p
// use of cin and/or cout in order to interact with user -5p
}
```

**Problem 8 (30pts.)**

Write a program that asks the user to enter one number with decimal point and then passes value of that number to a function called FN. Function should print the value of that number back to the screen and return nothing. Unnecessary code will be penalized. **YOU MUST USE A FUNCTION** in addition to main program.

```
#include <iostream>
using namespace std;
// include required library

void FN(double v);
// FN prototype (unless function implemented above main) - graded to match FN below

void main() {
// void main() or int main()-return(0) format

    double x;
// declare variable

    cout << "Please enter ";
    cin >> x;
// acquire value

    FN(x);
// call function, don't use cout to do it

}

void FN(double v) {
// implement function - receive value

    cout << v << endl;
// implement function - do print

// implement function - void - no return
}

// 3 points for each observed component, checked "quickly"
```