International Islamic University Chittagong

Department of Computer Science & Engineering

B. Sc. in CSE Semester Final Examination, Spring 2014

Course Code: CSE 1201 Course Title: Structured Programming

Total marks: *50* Time: *2* hours 30 minutes

[Answer any *three* questions from **Group-A** and any *three* questions from **Group-B**: Separate answer script must be used for Group-A and Group-B.]

Group-A

What is the purpose of the *do-while* statement? How does it differ from the *while* statement? 2

Write the output of the following C programs: 3

i.
```
#include<stdio.h>
main( )
{
  int i=0,x=0;
  for(i=1; i<10; ++i)
  {
    if(i%2==1)
      x+=i;
    else
      x--;
    printf("%d",x);
  }
printf("\nx=%d",x);
}
```

ii.
```
#include<stdio.h>
main( )
{
  int i=0, x=0;
  do{
      if( i%5==0){
       x++;
      printf("%d",x);
      }
      ++i;
     }while(i<20);
  printf("\n x=%d",x);
}
```

Write a program to find the *sum* of all integers greater than 100 and less than 200 that are divisible by 7. 3

Explain *break* and *continue* statements with example. 2

a) Define function and function prototype. 2

b) What is the difference between formal parameter and actual parameter? Briefly describe call by value and call by reference technique with example. 4

c) What is recursion? Write a program to calculate the factorial of a positive integer using recursion. 4

a) How many storage classes are available in C? Explain them briefly. 4

b) Write a program to print the following pattern. Number of lines to be printed should be taken as input. 4

```
!
2 3
4 5 6
```

c) Describe the output of the following program

```
#include<stdio.h>
int funct(int x);
main( )
 {
   int a, count;
   for(count=1;count<=5;++count)
   {
    a=funct(count);
    printf("%d",a);
   }
}
int funct(int x)
{
 int y,
 y=x*x;
 return y;
}
```

Group-B

4. a) What is array? Write an appropriate array definition for the following two dimensional 3 X 3 integer array called n. Assign the following values to the array elements:

10	12	15
20	22	24
30	25	32

b) Write the output of the following program:

i.
```
main( )
{
 int a,b=0;
 int c[10]={1,2,3,4,5,6,7,8,9,0};
 for(a=0;a<10;++a)
 {
   if((a%2)==0)
      b+=c[a];
 }
 printf("%d",b);
}
```

ii.
```
main( )
{
 int a;
 char c[]="Programming with C"
 for(a=0;c[a]!='\0',++a)
 {
   if(a%2==0)
     printf("%c",c[a]);
 }
}
```

c) What is pointer? Write the importance of using pointers in C programming.

d) Write a program to add two matrices.

5. a) What is structure? Compare and contrast among structure, union and array.

b) What is data file? Briefly describe the different *modes* of opening a file.

c) Write a program that will read information (name, ID, department, section, CGPA) of n students from user. The program will then write the information in "C:\output.dat" file.

6. a) What is bitwise operation? Briefly describe any three bitwise operations. 4

b) Briefly explain with parameters, the purpose of the following functions in C: 3
i) initgraph( ) ii) circle( ) iii) line( ) iv) setcolor( )

c) Suppose that v is an unsigned, 16-bit integer quantity whose hexadecimal value is 0x6db7. 3
Evaluate the following shift expression by utilizing the original value of v :
i) v>>3 ii) v<<3

7. a) What is string? Briefly explain the following functions with example. 4
i. strcat( ) ii. strcpy( ) iii. strcmp( ) iv. strlen( )

b) What do you mean by dynamic memory allocation? Explain with an example. 2

c) What is self referential structure? Give an example. 1

d) Write a program to count the number of characters stored in "C:\myfile.txt" 3

3
4
3

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International Islamic University Chittagong

Department of Computer Science & Engineering

Final Examination, Autumn 2014

CSE 1201 Structured Programming

Total marks: ***50*** Time: 2 Hours

[Answer any *two* from **Part A** and any *two* from **Part B** of the following questions. Figures in the right-hand margin indicate full marks.]

Part A

a) Determine how many times the body of each loop will be executed. 3

i)
```
int x =1, y = 10;
for(; x <= y; x++, y--)
{
      printf("%d\n",x);
}
```

ii)
```
int x = 10, y = 50,
while(x <= y)
{
      y = y / x;
}
```

iii)
```
m = 10;
do
{
  m = m - 3;
} while (m > 1);
```

b) Why is the use of the *goto* statement generally discouraged? Under what conditions might the *goto* statement be helpful? 2.5

c) What are the purposes of *break* and *continue* statements? Explain with example. 3

d) Write a C program to determine the *Greatest Common Divisor (GCD)* of two given positive integers. 4

3 a) What is a *function*? Write the first line of the function definition, including the formal argument declarations, for each of the situations described below: 3

i) A function called *sample* generates and returns an integer quantity.

ii) A function called *root* accepts two integer arguments and returns a floating-point result.

iii) A function called *process* accepts an integer and two floating-point quantities (in that order), and returns a double-precision (**double**) quantity.

iv) A function called *value* accepts two double-precision quantities and a short-integer quantity (in that order). The input quantities are processed to yield a double-precision value which is displayed as a final result.

b) Describe the output generated by the following program- 2

```
#include<stdio.h>
int x = 5;
int fun1( )
{  x = x + 20;    return x; }

int fun2( )
{  int x = 10;    return x; }

int fun3( )
{  x = x - 10;    return x; }
```

```
int main( )
{
   x = 1;
   printf("x = %d\n", x);
   printf("x = %d\n", fun1( ));
   printf("x = %d\n", fun2( ));
   printf("x = %d\n", fun3( ));
   return 0;
}
```

c) What do you mean by *storage class*? Briefly discuss any three storage class with examples.

d) What is *recursion*? Write a C program to calculate the *factorial* of a positive integer quantity using recursion.

3. a) Write C code segment to print all the *odd* numbers from 1 to 100 inclusive in decreasing order using **for** loop. Rewrite the same using **while** and **do-while** loop.

b) What do you mean by *function prototypes*? Where within a program are function prototypes normally placed? Give example.

c) Write the output generated by the following program-

i)

```
#include <stdio.h>
int main ()
{
   int i, j, k, x = 0;
   for (i= 0; i < 5; ++i )
   for ( j = 0;  j < i; ++ j )
   {
         k = ( i + j - 1);
         if ( k % 2 == 0)
            x += k;
         else if (k % 3 == 0)
            x += k - 2;
         printf ("%d  ", x);
   }
   printf ("\nx = %d", x);
   return 0;
}
```

ii)

```
#include <stdio.h>
int a = 0, b = 1;
int funct2 (int a) {
   return (b + a);
}
int funct1 (int  a) {
   b = funct2 (a +  1) + 1;
   return (b);
}
int main () {
      int c;
      for (c = 1; c <= 5; ++c) {
            b += funct1(a + 1) + 1;
            printf ("%d  ", b);
      }
}
```

d) Write a C program that will read a positive *decimal* integer and determine and print its *binary* equivalent.

Part B

4. a) Write an appropriate array definition for each of the following situations.

i) Define a one dimensional, character array called **point**. Assign the string "WEST" to the array elements. End the string with null character.

ii) Define a two-dimensional, 3 X 4 integer array called **table**. Assign the following values to the array elements.

10	12	14	0
0	20	22	0
0	30	32	0

b) What is a *pointer*? What is meant by *dynamic memory allocation*?

c) When passing an argument to a function, what are the differences between *passing by value* and *passing by reference*? Explain with a simple C program. 3.5

d) Write a C program that reads n numbers from keyboard, store in an array and rearrange the numbers in ascending order and then display the list. 5

5. a) What is a *structure*? How does a structure differ from a *union*? 2

b) What is *self-referential structure*? Give example. For what kinds of applications are self-referential structures useful? 2.5

c) Define *stream pointer*. Write different *file types* that can be specified by the *fopen()* function. 3

d) Write a C program that reads a text file called *test.txt* and read the numbers from the file and display the sum and average of them. 5

6. a) What do you mean by *bitwise operations*? Briefly describe any three bitwise operators with examples. 3.5

b) Write the different types of *preprocessors* in C, When these preprocessors are executed? 2

c) Briefly explain, with parameters, the purpose of the following functions in C 3

i) *initgraph()* ii) *line()* iii) *circle()*

d) Write a C program that will illustrate the equivalence between *shifting* a binary number to the left n bits and *multiplying* the binary number by 2^n. 4

7. a) Define *string*. Briefly explain the purpose of the following functions in C- 3

i) strcat () ii) strcpy () iii) strcmp ()

b) A C program contains the following statements. 3

```
int i, j = 25;
int *pi, *pj = &j;
. . . . . .
*pj = j + 5;
i = *pj + 5;
pi = pj;
*pi = i + j;
```

Suppose each integer quantity occupies 2 bytes of memory. If the value assigned to i begins at (hexadecimal) address **F9C** and the value assigned to j begins at address **F9E**, then

i) What value is represented by `&i, &j, pi`?

ii) What value is assigned to `pj, *pj, i`?

c) Suppose that v is an unsigned, 16-bit integer quantity whose hexadecimal value is `0x6db7`. Evaluate each of the following shift expressions. (Utilize the original value of v in each expression) 2.5

```
i)   v << 3
ii)  v >> 3
```

d) Write a C program using *array of structure* that will allow you to enter and display the following information about your family members: 4

i) *name* ii) *age* iii) *last degree* iv) *occupation* v) *salary*

International Islamic University Chittagong

Department of Computer Science & Engineering

B. Sc. in CSE Semester Final Examination, Spring 2015

Course Code: CSE 1201 Course Title: Structured Programming

Total marks: *50* Time: *2* hours *30* minutes

[Answer any *two* questions from **Group-A** and any *three* questions from **Group-B;** Separate answer script must be used for Group-A and Group-B.]

Group-A

Define *goto* statement. Why should we avoid the use of *goto* in big programs? 2

Determine the outputs of the following programs: 2

```
#include<stdio.h>
int main()
{
  char j=1;
  while(j < 5)
  {
    printf("%d, ", j);
    j=j+1;
  }
  printf("\n");
  return 0;
}
```

```
#include<stdio.h>
int main()
{
    int i = 1;
    for(;i<=100 && i>=-100; ){

        printf("%d,", i);
        i*=2;
     }
    return 0;
}
```

What are the differences between while, do-while and for loop? Explain with examples. 3

Write a C program to calculate the GCD of two numbers. 3

a) Define function and function prototype. 2

b) Explain "call-by-value" and "call-by-reference" with example. 4

c) Write the first line of the function definition, including the formal declaration, for each of the situation described below: 2

i. A function called **root** that accepts two integer arguments and returns a floating point result.

ii. A function called **convert** that accepts a character and returns another character.

d) Describe the output of the following program:

```
#include<stdio.h>
int funct1(int n);
int main( )
 {
   int n = 10;
   printf("%d",funct1(n));
   return 0 ;
 }
int funct1(int n)
{
 if(n>0)
   return(n +funct1(n-1));
}
```

3. a) Explain static variables with example.
   b) What is recursion? Calculate the factorial of a positive integer using recursion.
   c) How can we obtain multiple return values from a function? Give example.
   d) Write a program to print the first n numbers of the following series.

   1 2 2 4 8 32.....

Group-B

4. a) What is dynamic memory allocation? Explain with an example.
   b) Describe the following declarations involving pointers:
      i. int *p(char *a);
      ii. int (*p)(char *a);
      iii. int *p(char (*a)[ ]);
   c) Write the output of the following program:

i.
```
int main( )
{
 int a,b=0;
 int c[10]={1,2,3,4,5,6,7,8,9,0};
 for(a=0;a<10;++a)
 {
if((a%2)==0)
      b+=c[a];
 }
 printf("%d",b);
 return 0 ;
 }
```

ii.
```
int main( )
{
 int a;
 char c[]="Programming with C"
 for(a=0;c[a]!='\0';++a)
 {
   if(a%2==0)
    printf("%c%c",c[a],c[a]);
 }
 return 0;
}
```

   d) Write a program to take a text input from keyboard. Display the uppercase of the text.

What is nesting of structure and array of structure? Give example.

How a structure type variable can be passed to a function? Explain with the help of an example.

Write a program to read data from keyboard, write it to a file called INPUT.TXT, again read the same data from the INPUT.TXT file and display it on the screen.

What is self referential structure? Give an example.

Explain different types of preprocessors in C. When these preprocessors are executed?

What are *bit fields*? Describe the advantages of bit field in programming?

Evaluate each of the following bitwise expressions.

unsigned a = 0x6db7;

unsigned b= 0xa726;

i) ~ a

ii) a & b

iii) a >> 7

iv) a | b

Describe command line argument. Give an example.

What is a *macro*? Write the advantages and disadvantages of using macro over function.

Write the uses of *fscanf*, *fprintf*, *fread* and *fwrite* functions.

Write a program to sort **n** numbers stored in an array.

Define *dynamic memory allocation* in C language. Give necessary example.

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Department of Computer Science & Engineering

Final Examination, Autumn 2015

CSE 1201 Structured Programming

Total marks: *50* Time: 2 Hours 30 minutes

[Answer any *two* from **Group A** and any *three* from **Group B** of the following questions. Separate answer script must be used for Group-A and Group-B.]

Group-A

Write C code segment to print all integers from 150 to 250 inclusive that are divisible by 5 using for loop. Rewrite the same using **while** and **do-while** loop. 3

Describe the output generated by the following program- 2

```
#include<stdio.h>
int main( )
{
    int i=0, x=0;
    do{
       if( i%10==0){
          x++;
          printf("%d ",x);
       }
       ++i;
    }while(i<50);
    printf("\n x = %d",x);
    return 0;
}
```

What are the purposes of *break* and *continue* statements? Explain with example.

Write a C program to reverse the digits of a given positive integer. (For example, the output for the number 786 will be 687)

What is a *function*? State the advantages of using functions.

Describe the output generated by the following program-

```
#include<stdio.h>
int x = 5;
int fun1( )
{  x = x + 10;    return x; }

int fun2( )
{  int x = 1;    return x; }

int fun3( )
{  x = x - 10;    return x; }
```

```
int main( )
{
    x = 10;
    printf("x = %d\n", x);
    printf("x = %d\n", fun1( ));
    printf("x = %d\n", fun2( ));
    printf("x = %d\n", fun3( ));
    return 0;
}
```

c) What do you mean by *storage class*? Briefly discuss any three storage class with examples.

d) What is *recursion*? Write a C program to calculate the value of the nth *Fibonacci number* using recursion.

3. a) Can any of the three initial expression in the `for` statement be omitted? If so, what are the consequences of each omission? Explain with example.

b) What do you mean by *local variable* and *global variable*? Explain with example.

c) Write the output generated by the following programs-

i)

```
#include<stdio.h>
int funct(int x);
int main( ){
    int a, count;
    for(count=1;count<=5;++count)
    {
        a=funct(count);
        printf("%d ",a);
    }
    return 0;
}
int funct(int x){
   int y;
   y=x*x;
   return y;
}
```

ii)

```
# include <stdio.h>
int funct1 (int count);
int main ()
{
   int a, count;
   for (count=1; count<=5; ++count)
   {    a = funct1(count);
        printf ("%d ", a);
   }
   return 0;
}
int funct1 (int x)
{  static int y = 0;
   y += x;
   return (y);
}
```

d) Write a C program that will read a positive integer n and determine whether n is *prime* or not.

Group-B

4. a) Write an appropriate *array* definition for each of the following situations.

i) Define a one dimensional, 12 element integer array called *Arr*. Assign the values 1, 4, 7, 10 to the first four-array elements and assign 0 for rest elements.

ii) Define a two-dimensional four elements character array called *direction*. Assign the strings `North, South, East and West` to the array elements.

b) What is a *pointer*? What are the purposes of *address operator* (&) and the *indirection operator* (*)? Explain with example.

c) When passing an argument to a function, what are the differences between *passing by value* and *passing by reference*? Explain with a simple C program.

d) Write a C program to *convert* a number from decimal to binary.

What is *structure*? Compare and contrast among *structure*, *union* and *array*. 3

What is *self-referential structure*? Give example. 1

What is *data file*? Briefly describe the different *modes* of opening a file. 2

Write a C program to read data from the keyboard, write it to a file called INPUT.TXT, again read the same data from the INPUT.TXT file and display it on the screen. 4

What do you mean by *bitwise operations*? Briefly describe any three bitwise operators with examples. 3

What is a *macro*? Declare a macro called SQUARE which will make square of any data. 1

Briefly explain, with parameters, the purpose of the following functions in C 3

i) *initgraph()* ii) *line()* iii) *circle()* iv) *setcolor()*

Write a C program that will illustrate the equivalence between *shifting* a binary number to the left n bits and *multiplying* the binary number by 2^n. 3

Define *string*. Briefly explain the purpose of the following functions in C- 2

i) strcat () ii) strcpy () iii) strcmp ()

Write the output of the following program 2

```
int main( )
{
    int *p, x[4]={1,2,3,4};
    for(p = x; p<x+4; p++)
        printf("%d ", ++(*p));
    return 0;
}
```

Suppose that `v` is an unsigned, 16-bit integer quantity whose hexadecimal value is `0x6db7`. Evaluate each of the following shift expressions. (Utilize the original value of `v` in each expression) 2

i) `v << 4`

ii) `v >> 4`

Write a C program using *array of structure* that will allow you to enter and display the following information about your family members: 4

i) *name* ii) *age* iii) *last degree* iv) *occupation* v) *salary*

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INTERNATIONAL ISLAMIC UNIVERSITY CHITTAGONG

Department of Computer Science and Engineering (CSE)

Final Examination, Spring-2016

Course Code: **CSE-1201** Course Title: **Structured Programming**

Full Marks: **50** Time: **2 Hours 30 minutes**

[Answer any two questions from Group-A and any three questions from Group-B; Separate answer script must be used for Group-A and Group B (Figures at right margin illustrate marks)]

Group – A

1. a) What are the purposes of the following statements with example: 4

   i) `while` ii) `do...while` iii) `goto` iv) `continue`

   b) Write a program to calculate factorial of a positive integer n (n!) by using `while` or `for` loop statement. 3

   c) Determine the outputs of the following C program: 3

```
#include <stdio.h>
int main(){
int a=0, b=0;
 while(a<25){
   if(a%6==0){
      b=b+a;
      printf("%d ",a);
   }
   a++;
 }
 return 0;
}
```

```
#include <stdio.h>
int main(){
int i=0, b=0;
 for(i=1;i<9;i++){
   if(i%2==1){
      b=b+i;
   else
      b--;
   printf("%d ",b);
   continue;
 }
 return 0;
}
```

2. a) What do you mean by function prototype? What are the differences between macro and user define function? Write the output of the following program: 3

```
#include<stdio.h>
#define MULTI(x,y) x*y

int main()
{
  printf("%d", MULTI(2+3,3+5));

return 0;
}
```

   b) Write a program that convert the positive decimal number to binary number using recursion function. 3

c) Write the differences between local variable and global variable. Find the output of the following program:

```
#include<stdio.h>
void fun1(int);
int x;
int main()
{
  int i;
  for(i=0;i<=3;i++)
   fun1(i*i);

return 0;
}

void fun1(int x)
{
   static int j;
    x+=j;
   printf("%d = \n",x);
}
```

3. a) Write a program that delete an specific integer element from an array. 3
b) What are the limitations of array? What are the differences following two initializations: 2

i) int a[] = {1, 2, 3}; int b[3] = {1, 2, 3};

c) How can we obtain multiple return values from a function?
d) Write a function to determine whether the given positive integer n is a prime number or not. 1
e) Fill in the blanks in following statement: 3
i) The parameters used in a function are called _____. 1
ii) The _____statement is used to skip a part of the statements in a loop.

Group – B

4. a) What is array? Which of the following statements are correct?
i) `int array[3],[4];` ii) `char a[]="c";` iii) `int m[1+2][4+2];` 2
b) Write output of the following program: 1.5

```
#include<stdio.h>
int main(){
   char s1[]="IIUC ", s2[]="Kumira", s3[]={0};
   printf("%d\n%s\n",strcmp(s1,s2),strcpy(s3,"CTG"));
   printf("%s\n",strcat(s1,s2));
}
```

c) Write a program to determine whether the given string is a palindrome or not. 3
d) What is pointer? How can it be declared? Give examples. 1.5
e) What do you mean by dynamic memory allocation? Give the example of malloc() and calloc() function. 2

5. a) What are the advantages and disadvantages of low-level programming in C. Write a program that check whether a given positive number is odd or even using bit-wise AND and necessary control statements. 4

b) What are the advantages of bit fields? Explain with a program example. 3

c) Write a C program that display the bit pattern from a given positive integer number. 3

6. a) Evaluate each of following bitwise expressions: 2.5

```
int x=0x5da6, y=0x369c;
```

i) x|y ii) x^y iii) x<<4 iv) y>>8 v) x&y

b) What is macro? Why is it use? How is a multiline macro defined? Explain with an example. 3

c) What do you mean by the command line parameters and enumeration? Give their examples. 2

d) Which bitwise operator can be used to exchange the value of two positive integers? How is it works? Expain with a program. 2.5

7. a) What are the differences between call by value and call by reference? Explain it with a program that interchanges values between two variables. 3

b) Write the meaning of following declarations: 3

(i) int *a[5];

(ii) int *p(char);

(iii) int f(char *a[])

c) Write a program that sort the given integer data in ascending order where array as a function argument. 4

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International Islamic University Chittagong

Department of Computer Science & Engineering

B. Sc. in CSE Semester Final Examination, Autumn-2018

Course Code: CSE-1221 Course Title: Computer programming-I

Total marks: *50* Time: *2* hours *30* minutes

[Answer any *two* questions from **Group-A** and any *three* questions from **Group-B;** Separate answer script must be used for Group-A and Group-B.]

Group-A

Define operator overloading? Write the rules of operator overloading. 2

Create a class float that contains one float data member. Overload an arithmetic operator so that it can operate on the objects of float. 3

A friend function cannot be used to overload the assignment operator (=). Explain why? 2

Answer the following questions with explanation 3

i) When an operator is overloaded, does it lose any of its original functionality?
ii) Can the precedence of an overloaded operator be changed? Can the number of operand be altered?

"A derived class can access all the members of its base class."-Is this statement true? Justify your answer. 2

Design a program to implement multiple inheritance. 3

How to invoke Base class's parameterized constructor inside Derived class's parameterized constructor? 3

Write the output for the following code: 2

```
class P {
public:
  void print()  { cout <<" Inside P"; }
};

class Q : public P {
public:
  void print() { cout <<" Inside Q"; }
};

class R: public Q { };

int main(void)
{
 R r;
 r.print();
 return 0;
}
```

3. a) When a base class is inherited as public by the derived class, what happens to its public members? What happens to its private members?

b)
```
class A
{
  public:
  void cheers()
  {
    cout<<"Class A: Hip-hip-hooray";
  }
};
class B
{
  public:
  void cheers()
  {
    cout<<"Class B: Hip-hip-hooray";
  }
};
class C:public A, public B
{

};
int main()
{
  C obc;
  obc.cheers();
}
```

Is there any error in this code? If yes, then correct the code. Display the output.

c) Class D is derived from Class B. The class does not contain any data members of its own. Do the class D required constructor? If yes, why?

Group-B

4. a) Write a program that implements the following ios functions:
width() , precision() , fill() , setf()
Write the output of your program.

b) What is manipulator? Formulate the differences between manipulators and ios member functions.

c) Design a program to write the following information to a file called WhoAreYou.txt :

Name: xxxxxxx
Semester: Autumn 2018
Course Code: CSE-1221
Course Title: Computer Programming 2

What is virtual function? Explain with example. 3

What do you know about early binding and late binding? Discuss the pros and cons of them. 4

What is abstract class? "Abstract class cannot be instantiated"- explain this statement. 3

What is an exception? What are the advantages of using exception handling mechanism in a program? 3

Write a generic function, called min ( ), that returns the lesser of its two arguments. 3

Show the general form of try, catch and throw for exception handling. In your own words describe their operations. 2

What is the output of the following code? 2

```
#include <iostream>
#include <algorithm>
using namespace std;
int arr[] = {111,-999,222,-333,0,0,-555,555,999,333};
int main()
{
sort(arr, arr+10);
for(int j=0; j<5; j++){
cout << arr[j] <<' ';
cout << endl;
return 0;
```

What is generic function and generic class? 2

What will happen if an exception is thrown for which there is no corresponding catch statement? 2

What do you know about inserter? Briefly explain. 2

What is STL? Define a container, an iterator and an algorithm as they relate to the STL. 4