Shahjalal University of Science and Technology

Department of Computer Science & Engineering

1st Year 2nd Semester Final Examination 2014

Course: CSE 103E (Introduction to Programming Language)

Full Marks: 50 Time: 2 Hours

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(Answer any **four** questions taking **two** from each group)

GROUP-A

1\. a) Determine which of the followings are valid identifiers. If invalid, explain why. 2.5

value 1, a&b, CSE 203, Roll-No, 5numbers

b) State the names of *four* basic data types in C along with the typical memory requirements. 4

c) Considering the declarations and initial assignments of variables, calculate the *value* and *type* of the following expressions: 6

```
int i = 5;
float f = 2.5;
char ch = 'B'; //ASCII code of B is 66

    i)      (i - ch) + (3 * f / 5)
    ii)     (int)(i + f) % 5
    iii)    floor(f + 1) / sqrt(9)
    iv)     5 * (i + 2) <= 35
    v)      (i > 4 * f)? ch : ch + 1.
    vi)     i += f + 5
```

2\. a) Write the following program by using *if-else* structure: 3.5

```
#include<stdio.h>
void main()
{
    int a, b, c;
    printf("Enter two numbers:");
    scanf("%d %d", &a, &b);
    c = a > b ? a : b;
    printf("%d", c);
}
```

b) Give the output of problem 2(a) for *a=15, b=20* and *a=25, b=10.* 3

c) Describe the output that will be generated by the following C programs. 6

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

a) Write a loop that will calculate the sum of every *second* integer, beginning with *i = 1* (i.e. calculate the sum 1+3+5+7+......) for all values of *i* that are less than 100. Write the loop in following ways: 4+4+4.5

i. Using a *while* statement.

ii. Using a *do-while* statement.

iii. Using a *for* statement.

GROUP-B

4. a) Describe the output generated by the following program. 6.5

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

b) Describe the output that will be generated by the following program. 6

```
#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);
}
```

5. a) Explain the meaning of each of the following function prototypes. 4.5

   i. *double f (double a, int b);*
   ii. *void f (long a, short b);*
   iii. *char f ( );*

b) Consider the declaration *int A[10]*. If the array starts at memory address 0, what will be the starting address of *A[5]*. Consider that an integer element takes *2 bytes* of memory space. 2

c) Show with a figure the array defined in each of the following statements: 3

   i) *int p[6] = {0, 1, 2, 3};*
   ii) *int q[2][3] = {0, 1, 2, 3};*
   iii) *int r[3][4] = {{0, 1, 2, 3}, {4, 5}};*
   iv) *char str[] = "CSE";*
   v) *char str1[3] = "CSE";*
   vi) *char str2[4] = "CSE";*

d) Write a function that returns 1 if the number given to it as an argument is a prime otherwise it returns 0. 3

6. a) Describe the output generated by the following program. 2

```
#include <stdio.h>
int c[10] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 0};
main( )
{
  int a, b = 0;

  for (a = 0; a < 10; ++a)
     if ((c[a] % 2) == 1) b += c[a];
  printf("%d", b);
}
```

b) What is a structure? How does a structure differ from an array? 3

c) Explain the meaning of each of the following C program statements. 4.5

   i. *fpt = fopen ("sample.dat", "r+");*
   ii. *fpt = fopen ("sample.dat", "w");*
   iii. *fclose(fpt).*