



Uva Wellassa University, Sri Lanka

B.Tech Degree Programme 2006/07

BSc in Computer Science Degree Programme 2006/07

End Semester Examination - Semester 1

January 2008

CST 103-2 Structured Programming

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**Instructions**

Answer for all **Four (04)** questions

Time: Two hours

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(1) You are given a set of  $N$  integers  $x_1, x_2, \dots, x_N$ .

(i) Write a single pseudo code to find

(a) Total number of even integers in the set.

(b) Total number of odd integers in the set.

(c) Sum of all even integers

(d) Sum of all odd integers

(ii) Suppose now you are given second set of integers  $y_1, y_2, \dots, y_N$

(ii) Write a pseudo code to find out whether this second set of integers is the same as the first but in a different order. (i.e. for each  $i$  between 1 and  $N$ , find out whether there is a  $j$  between 1 and  $N$  such that  $y_i = x_j$ )

(2) (a) What are the differences between string constant "x" and character constant 'x' in C.

(b) Consider following C code

```
#include <stdio.h>
#include <string.h>
int main(void)
{
char name[40];

printf("What's your name?\n");
scanf("%s", name);

// The First print statement
printf("%d %d\n", strlen(name), sizeof name);

// The Second print statement
printf("%d %d\n", sizeof name[0], sizeof (char) );

return 0;
}
```

Suppose when you run this code you enter your name as

*Nimali Perera*

(i) What is the output you get from the first print statement?  
Explain your answer.

(ii) What is the output you get from the second print statement?  
Explain your answer.

(3) What are syntax errors?

The following C program is written to read a paragraph from the keyboard and then print number of characters, number of words and number of spaces in the paragraph.

```
#include <stdio.h>
#include <conio.h>

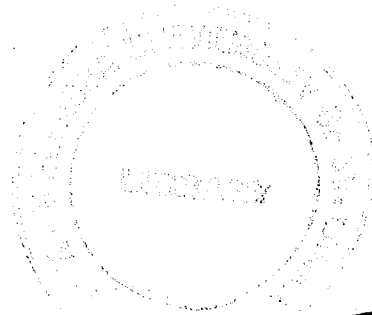
int main(void) {
    char c;
    int n,num_space=0,num_char=0;
    int num_words=0; wd_flag=0;

    while((&c=getch())!='\r')
    {
        if(c=32)
        {
            num_space++;
            wd_flag=0;
        }
        else
        {
            if(wd_flag=0) num_words++;
            wd_flag=1;
        }
        num_char++;

        printf("%s",c);
    }
    printf("\nNumber of characters = %c\n",num_char);
    printf("Number of words = %lf\n",num_words);
    printf("Number of blank spaces = %g\n",num_space);

    return 0;
}
```

- (a) Find syntax errors in the program.
- (b) Rewrite the code correcting the syntax errors.



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- (4) What are the advantages of having functions in structured programming?  
What are the local variables and global variables?

You are given following C program

```
#include <stdio.h>
#include <conio.h>
#include <string.h>

int main(void) {
    char para[255];
    char copy[255];
    int i=0;

    while((para[i]=getch())!='\r')
    {
        printf("%c",para[i]); // This echoes what user types
        i++;
    }
    para[i]='\0';

    copy_until(copy,para, '.');

    printf("%s\n", copy);
}
```

This program is written to obtain a text paragraph from the user and then print the first sentence of the paragraph. This is done by copying the characters in the array `para` to character array `copy` until the first appearance of the character `'.'`. If the paragraph does not contain `'.'` then the program should print the whole paragraph.

As an example, if the user enters

Today is a rainy day. The sky is full of dark clouds

Then the program should print

Today is a rainy day.

if the user enters

Today is a rainy day The sky is full of dark clouds

Then the program should print

Today is a rainy day The sky is full of dark clouds

**Complete the program by**

- (1) defining the prototype of the function `copy_until` above the `main()` and
- (2) writing the function `copy_until`. (**Hint:** You may use `strlen` function to obtain the number of characters in a character string and use `while` or `for` loop to copy characters in a character string to another string one by one.)