



No. of Pages : Two
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CCS1302 Problem Solving and Programming (Final Exam-Makeup)

(40 Points)

Question One:

(7.5 Points)

Mark (✓) or (X) for each of the following sentences:

1. The place holder "%c" is used for string data type. ()
2. Standard identifiers can be redefined as variables. ()
3. An already existing file when opened for writing, its contents will be overwritten. ()
4. The name of the local variable used in a function cannot be used in the main program. ()
5. All types of loops in C can be implemented using for loop. ()
6. In recursion, Stating the simple case is essential to guarantee its correct functioning. ()
7. An array can store many different types of values. ()
8. Pointers of different types may not be assigned to one another without a cast operation. ()
9. Integer division can be a source of logical error in some C programs. ()
10. The principle of Queue is First in Last out. ()
11. The loop in the shown program will be repeated 2 times. ()

```
#include <stdio.h>
void main()
{
    int j;
    for (j=0; j>1; j++)
        printf("Hello\n");
}
```

12. Binary search can be used to save searching time in case of unsorted array. ()
13. In C, short circuit evaluation can be used as a trap for the program logical error. ()
14. Queue is an important data structure required for the correct operation of recursion. ()
15. Addin [^\t] can solve the issue rises when entering line of words using (scanf). ()

Question Two:

What is the output of the following C programs (You must show your steps)

(12 Points)

```
int fun(int n)
{
    int i, j, sum = 0;
    for(i = 1; i<=n; i++)
        for(j=i; j<=i; j++)
            sum=sum+j;
    return(sum);
}
int main()
{
    printf("%d", fun(5));
    return 0;
}
```

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

int main()
{
    char s[35];
    char *a;
    int i=1;

    strcpy(s,"Intro to problem solving");
    printf("%s\n",s);

    a= strtok(s, " ");
    printf("%s.\n",a);
    while (i<=2)
    {
        a= strtok(NULL, " ");
        printf("%s.\n",a);
        i++;
    }
}
```


#include <stdio.h>

3

void functionA(int n)

{

if (n < 1) return;

printf("%d ", n);

n = n - 5;

functionB(n);

}

void functionB(int n)

{

if (n < 2) return;

printf("%d ", n);

n = n / 2;

functionA(n);

}

int main()

{

functionB(20);

return 0;

}

Question Three:

(20.5 Points)

Write C program to solve the following problems.

- Using for loop, accept a group of +ve numbers from the user (ended by -1) and then calculate the average of odd numbers (odd) and the average of even numbers (even).

Example: for an input of (3, 4, 7, 10, 11, 2, -1), the output will be:

Average of odd numbers = 7

Average of even numbers = 5.33

- For building electricity bill calculation. Using parallel arrays, read a series of 5 records which are:

- consumption unit (out of 1000)
- consumption type ('r' will stand for "residential", 'c' will stand for "commercial")

Use the following Table:

Units	Residential	Commercial
0<units<=200	0.8	0.6
above 200	0.7	0.3

- double Calc_Cost(double unit, char type);
(this function is used to calculate the cost according to the consumption type)
 - void Display_Bill(int x[], int n);
(this function is used to compute the total bill by adding the costs)
- Using a recursive function, find if an input string is palindrome or not.
Palindrome string means that this string can be read the same either from right or left.
Example: "aabaa" is a palindrome string
"aabbddaa" is not a palindrome string

Best Wishes