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CS143 Introduction to problem solving (Final Exam)

(40 Points)

Question One

(10 Points)

1. What is the return value of the following statement if it is placed in C program?
`strcmp("ABC", "ABC");`

- (a) 0
- (b) -1
- (c) 1
- (d) Compilation error

2. Choose a correct statement about C structures.

- (a) A structure can contain same structure type member.
- (b) A structure size is limited by only physical memory of that PC.
- (c) You can define an unlimited number of members inside a structure.
- (d) All the above.

3. Choose correct statement about Functions in C Language

- (a) Function is a group of c statements which can be reused any number of times.
- (b) Every Function has a return type.
- (c) Every Function may or may not return a value.
- (d) All the above.

4. A function which calls itself is called a ____ function.

- (a) Self Function
- (b) Auto Function
- (c) Recursive Function
- (d) Static Function

5. What is the file output of this program?

```
#include <stdio.h>
int main()
{
    FILE* pFile;
    char c;
    pFile = fopen("sample.txt", "wt");
    for (c = 'A'; c <= 'E'; c++) {
        putc(c, pFile);
    }
    fclose(pFile);
    return 0;
}
```

- (a) ABCD
- (b) ABC
- (c) ABCDE
- (d) None of the mentioned

6. What is the output of this program?

```
#include<stdio.h>

int main()
{
    int a[] = {1, 2, 3, 4, 5, 6};
    int *ptr = (int*)(a+1);
    printf("%d", *(ptr-1));
    return 0;
}
```

- (a) 1
- (b) 2
- (c) 6
- (d) run time error

7. What is the output of the following C program?

```
int main()
{
    struct book
    {
        int pages;
        char name[10];
    } a;
    a.pages=10;
    strcpy(a.name, "Cbasics");
    printf("%s=%d", a.name, a.pages);
    return 0;
}
```

- (a) Cbasics=10
- (b) 10
- (c) Cbasics
- (d) run time error

8. What is the output of the following C Program?

```
int main()
{
    int a[];
    a[4] = {1,2,3,4};
    printf("%d", a[0]);
}
```

- (a) 1
- (b) 2
- (c) 4
- (d) Compiler error

9. What is the output of the following C program?

```
int main()
{ char grade[] = {'A','B','C'};
  printf("GRADE=%d", *grade);
  printf("GRADE=%d", grade[0]);
}
```

- (a) A A
- (b) 65 A

- (c) 65 65
(d) None of the above

10. What is the output of the following C Program with functions

```
void myshow(int);
void main()
{
    int a=10;
    printf("%d ", a);
    myshow(a);
    printf("%d", a);
}
void myshow(int k)
{
    k=20;
}
```

- (a) 10 10
(b) 20 20
(c) 10 20
(d) Compiler error

Question Two

Find the error in each of the following program segments and explain how the error can be corrected (10 Points)

a)

```
int sum( int x, int y )
{
    int result;
    result = x + y;
}
```

b)

```
int sum( int n )
{
    if ( n == 0 ) {
        return 0;
    }
    else {
        n + sum( n - 1 );
    }
}
```

c)

```
void product( void )
{
    int a, b, c, result;
    printf( "Enter three integers: " )
    scanf( "%d%d%d", &a, &b, &c );
    result = a * b * c;
    printf( "Result is %d", result );
    return result;
}
```

d)

```
char str[ 5 ];
scanf( "%s", str ); /* User types hello */
```

e)

```
int a[ 3 ];
printf( "%d %d %d\n", a[ 1 ], a[ 2 ], a[ 3 ] );
```

Question Three

(20 Points)

1. Write a C program that construct an array of n elements entered by a user and build the following:
- Write a **recursive function** (recursiveMinimum) that returns the smallest element value of the array
 - Write a **binary search** function (b_Search) to search about a value entered by a user
2. Define a **structure** for an Employee having EmployeeName, EmployeeCode, BasicPay, DearnessAllowance, HRA, PF, GrossPay, NetPay. Take an array of 10 Employees. Write 'C' functions to:-
- a) Accept data for EmployeeName, EmployeeCode, BasicPay for all the employees.
 - b) Compute:-
 - a. DearnessAllowance = 50% of BasicPay
 - b. HRA = 20% of BasicPay + DearnessAllowance
 - c. PF = 12% of BasicPay + DearnessAllowance
 - d. GrossPay = BasicPay + DearnessAllowance + HRA
 - e. NetPay = GrossPay - PF
 - c) Display the name of employee who has highest GrossPay.
 - d) Compute and display average net pay.
3. Write a program to input name, address, telephone and salary amount of 'n' persons ($n \leq 20$). Sort according to the salary. Print the sorted array.

With my best wishes