

REGENT UNIVERSITY COLLEGE OF SCIENCE AND TECHNOLOGY

END OF FIRST SEMESTER EXAMINATION SICS 151 PRINCIPLES OF PROGRAMMING (USING C)

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3hr

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INSTRUCTION: Answer all questions in section A and One in Section B

SECTION A

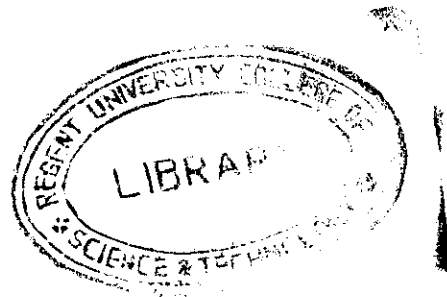
1. Identify all syntactic errors in the following C program:

```
// This program finds the greatest common divisor of two
// Nonnegative integer values */
main ( )
{
    Int    val1, val2, u1, v1, Temp;

    printf ("Please type in two nonnegative integers.\n");
    scanf  ("%i%i", val1, &val2);

    u1 = val1;
    v1 = val2;

    While ( val2 != 0 )
    {
        Temp = val1 % val2
        Val1 = val2;
        Val2 = temp;
    }
    printf (" The greatest common divisor of %i and %i is %i\n", u1, v1,
            val1);
}
```



2. Identify all logical errors in the following C statements:

- a)

```
int val = 500;
if ( val = 20 );
    printf ( "val equals 20\n" );
else
    printf ( "val equals 500\n" );
```
- b)

```
int ind;
for ( ind == 0; ind < 3; val++ )
    printf ( " ind = %d\n", ind );
```

What output might you expect from the following statements:

- c)

```
if ( val = 20 );
    printf ( "val equals 20\n" );
else
    printf ( "val equals 500\n" );
```
- d)

```
for ( ind == 0; ind < 3; val++ )
    printf ( " ind = %d\n", ind );
```

3. What will be the output of the following program?

```
main ( )
{
    int    a = 25,    b = 2,    result;
    float  c = 25.0, d = 2.0;

    printf ( " 6 + a / 5 * b = %i\n" , 6 + a / 5 * b );
    printf ( " a / b * b = %i\n" , a / b * b );

    printf ( " c / d * d = %f\n" , c / d * d );
    printf ( " 2 ^ b * a = %i\n" , 2 ^ b * a );
}
```

4. a. What basic data type are the following constants:

`\n'` `34F` `54ul` `0176u` `5.75E-5`

b. Which of the following are **invalid** variables and why?

`No_of_Moves` `double` `Bravo!` `Car4Sale` `widow's_mite`
`int_` `integar`

c. Explain the following compound relational operations:

```
(( c >= 'a' && c <= 'z') || (c >= 'A' && c <= 'Z' ));  
(c >= '0' && c <= '9')
```

5. How will the expression: **a * (b + c) % d;** be evaluated?

If a = 25, b = 1, c = 4, d = 5;

6. Explain the following statement

- a) `int values [20];`
- b) `K = grades [50];`
- c) `Colleges [100] = 95;`
- d) `grades [i] = K;`

7. What will be the initial values of the elements of the following arrays?

- a) `int dummy [5] = { 0, 0, 0, 0, 0 };`
- b) `int integers [7] = { 0, 1, 2, 3, 4 };`
- c) `char letters [6] = { 'a', 'b', 'c', 'd', 'e', 'm' };`
- d) `float values [5] = { 30.0, 12.5, 10.4 };`

8. What will the output of the following program be?

```
main ( )
{
  int stored_data [10] = { 0, 1, 4, 9, 16 };
  int i;

  for ( i = 5; i < 10; ++i )
    stored_data [ i ] = i * i;

  for ( i = 0; i < 10; ++i )
    printf ( "stored_data [ %i ] = %i\n", i, stored_data [ i ] );
}
```

9. Explain the following statements.

- a) int Max [6] [10];
- b) int Parray [2] [3] = { {176, 4068, 303}, { 6, 55, 777} };
- c) float Farray [3] [3] = {17.6, 406.8, 30.3, 0.6, 5.5, 89.7};
- d) unsigned char My_bytes [10] [20];

10. Consider the 3 X 4 array:

```
int A [3] [4] = {
                                     { 5, 9, 0 },
                                     { -1, 10, 14 },
                                     { 23, 1, 6 }
};
```

Calculate:

- a) sum = A [0] [3] + A [2] [0];
- b) diff = A [1] [2] - A [1] [0];
- c) prod = A [2] [2] * A [0] [3];
- d) quot = A [1] [1] / A [0] [0];

Section B:

Answer any one of the following questions:

1. Write a program that:
 - i. Calls a function **calc_sum** to calculate the sum of the digits of an integer that is entered from the terminal. (e.g.: the sum of the digits of the number **1734** is $1 + 7 + 3 + 4 = 15$).
 - ii. Displays the appropriate message. (show code for function)

2. Write a program that:
 - i. Calls a function **rev_digit** to reverse the digits of an integer that is entered from the terminal (e.g.: if the user types in **1234** then the function will reverse the digits of this number to **4321**).
 - ii. Displays the appropriate message. (show code for function)

3. Write a program that:
 - i. Calls a function **calc_prod** to calculate the product of the digits of an integer that is entered from the terminal. (e.g.: the product of the digits of the number **1734** is $1 * 7 * 3 * 4 = 84$).
 - ii. Displays the appropriate message. (show code for function)

4. It has been established, that the total number of pairs of rabbits for each successive month will be the sum of that of the two preceding months.

Therefore, if Rabbits [0] = 0; and
Rabbits [1] = 1; by definition,

Write a program to generate the number of pairs of rabbits for the first 10 months.