

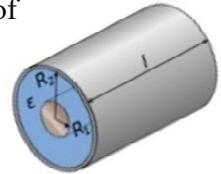
**Quiz # 1 - ICS 103 Lab Sec-53: Computer Programming in C - Term 191**

Name: ..... **KEY SOLUTION** ..... ID: .....

---

The formula gives the capacitance of a coaxial cable in Farads. The dielectric is made out of a material with permittivity  $\xi$  (figure).

$$C = \frac{2\pi\xi l}{\ln(R2/R1)}$$



Write a code that prompts the user to enter the capacitance C in F and the length l in m, then finds the ratio of the 2 radii.

Note that the dielectric material has permittivity constant  $\xi$  equal to  $F \cdot m^{-1}$  and  $\pi = 3.141592$ .

**Sample Program Run:**

```
Enter Capacitance in Farads: 10.52E-12
Enter Length in meters: 0.1
For a cable with capacitance 1.05E-011, and length 1.00E-001
The ratio of the two radii of the conductor = 1.70
```

---

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

#define PI 3.141592
#define EPS 8.854187E-12

int main(void){

    double C, l, ratio;

    printf("Enter Capacitance in Farads: ");
    scanf("%lf", &C);
    printf("Enter Length in meters: ");
    scanf("%lf", &l);

    /* Calculate log of ratio then ratio */
    ratio = 2*PI*EPS*l/C;
    ratio = exp(ratio);

    printf("For a cable with capacitance %.2E, and length %.2E\n", C, l);
    printf("The ratio of the two radii of the conductor = %3.2f \n", ratio);

    return(0);
}
```