FACULTY OF INDUSTRIAL SCIENCES & TECHNOLOGY
MATERIAL TECHNOLOGY PROGRAMME

ELECTRICITY, MAGNETISM & OPTICS

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CH04: CAPACITANCE AND DIELECTRICS

1. A parallel-plate capacitor has capacitance 10.0 nF with separation distance of 0.5 mm. Calculate the area of the plates.

2. Two long, coaxial cylindrical conductors are separated by vacuum. The inner cylinder has radius r_a and linear charge density $+\lambda$. The outer cylinder has radius r_b and linear charge density $-\lambda$. Find the capacitance per unit length of this capacitor.

3. Calculate the equivalent capacitance between the points A and B as shown in figure 4.1 below.

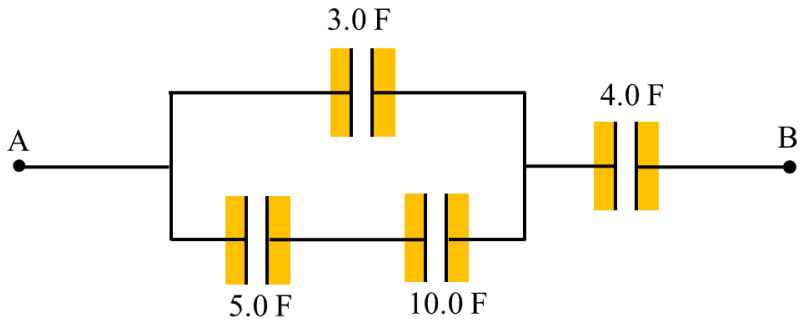

Figure 4.1

4. Find the energy stored by the electric field between two square plates with 9 cm sides and separated by a 1.25 mm air gap if the charge stored is 360 μC.

5. The potential difference between point A and B in figure 4.1 above is 10.0 V. Calculate the energy stored in the capacitor network.