CAPACITORS

1. A parallel condenser is charged and is disconnected from the battery. If the plates of the capacitor are moved further apart by insulating handles
   1) The charge becomes zero
   2) Capacitance becomes infinite
   3) The charge and capacitance increase
   4) The voltage across the plates increases
2. Parallel plate capacitor with air as the medium has the capacitance 10 μF. The area of the capacitor is divided into two equal halves and filled with two media, having the dielectric constant $K_1 = 2\ and\ K_2 = 4$. The capacitance of the system will now be
   1) 10 μ F
   2) 20 μ F
   3) 30 μ F
   4) 40 μ F
3. Resistors R_1 and R_2 and the capacitor C are connected to a battery of E.M.F.V volts, through the switches S_1 and S_2 as shown in the figure. The capacitor will get fully charged to V volts when
   1) S_1 is open and S_2 is closed
   2) S_2 is open and S_1 is closed
   3) S_1 and S_2 are both open
   4) S_1 and S_2 are both closed
4. The resultant capacitance between the point A and B in the given circuit is
   1) C
   2) C/2
   3) 2C
   4) 3C
5. The energy stored in a 50 μ F capacitor charged to 6 KV is the same as that required to lift a 24kg mass. What would be the greatest vertical height through the mass could be raised ?
   1) 1.8m
   2) 3.6m
   3) 0.9m
   4) 7.2m
6. A parallel plate capacitor is to be made by inserting one of the sheets of dielectric material include below, between and in contact with two plates of copper

	K	d[in m]
1) Teflon	2	0.4
2) Quartz	3	0.8
3) Glass	4	1.0
4) Mica	5	1.2

7. Calculate the effective capacitance between A and B if the capacitance of the capacitor is 1 μ F.

1) ∞ 2) Zero 3) μf 4) 8 μf

8. The capacitance of a parallel plate capacitor is C_0. If a dielectric of relative primitivityε_r and thickness equal to one fourth the plate separation is introduced between the plates, then its capacitance becomes C. The value of C/C_0 is

1) $\frac{5\varepsilon_r}{4\varepsilon_r+1}$
2) $\frac{4\varepsilon_r}{3\varepsilon r_1+1}$
3) $\frac{3\varepsilon_r}{2\varepsilon_r+1}$
4) $\frac{2\varepsilon_r}{\varepsilon_r+1}$

9. Four conducting plates each of areaA are placed equidistant from each other. The inner plates are connected electrically to point A and the outer plates are electrically connected to point B as shown. The effective capacitance of the system is

1) $\varepsilon_0 A/d$
2) 2 $\varepsilon_0 A/d$
3) 3 $\varepsilon_0 A/d$
4) 4 $\varepsilon_0 A/d$

10. The effective capacitance between the points P and Q of the arrangement shown in the figure is

1) $\frac{1}{2}\mu F$
2) 1 μF
3) 2 μF
4) 1.33 μF

11. In the accompanying circuit, if the point c is connected to the point a and the point d is connected to the point b, the effective capacitance between the points a and b is

1) 20 μF
2) 60 μF
3) 80 μF
4) 120 μF

12. A fully charged capacitor has a capacitance C. It is discharged through a small coil of resistance wire embedded in a thermally insulated block of specific heat capacity s and mass m. If the temperature of the block is raised by $\Delta \mathbf{T}$, the potential difference V across the capacitance is

1) $\sqrt{\frac{2mC\Delta T}{S}}$
2) $\frac{mC\Delta T}{s}$
3) $\sqrt{\frac{mC\Delta T}{C}}$
4) $\sqrt{\frac{2ms\Delta T}{C}}$

13. A 10 μF capacitor is charged to a potential difference of 50 V and is connected to another uncharged capacitor in parallel. Now the common potential difference becomes 20 volt. The capacitance of second capacitor is

1) 10 μF
2) 20 μF
3) 30 μF
4) 15 μF

14. The equivalent capacitance of the circuit shown, between points A and B will be

1) $\frac{2}{3}\mu$F
2) $\frac{5}{3}\mu$F
3) $\frac{8}{3}\ \mu$F
4) $\frac{7}{3}\ \mu$F

15. The value of equivalent capacitance of the combination shown in figure between the points P and G is

1) 3C
2) 2C
3) C
4) C/3

16. The equivalent capacitance between the points a and b in the diagram is

1) 1 pF
2) 1.5 pF
3) 2 pF
4) 2.5 pF