1. Describe what is meant by *electric field.*

2. Two masses, each of mass m, have gravitational force F between th
What is the gravitational force between tw ss s, each of charge

A $\frac{F}{3}$ **B** **C** $9F$

3. Wh it can be defined by the expression $\frac{F}{Il}$?

A weber **B** ampere **C** metre

4. Which of these gives the energy stored in a capacitor?
A $\frac{1}{2} QV^2$
B CV^2
C area under a graph of Q against V
D gradient of a graph of Q against V

5. One of the moons of Mars is called Deimos.
- mass of Deimos = 1.48×10^{15} kg
- mass of Mars = 6.39×10^{23} kg
- mean distance from the ce rs to the centre of Deimos

Calculate the mean fo Deimos in orbit.

6. Th tational potential, V, at the surface of Earth is -9.81 J kg^{-1}
(a) Sketch a graph of how V varies with increasing distance, r, fro
(b) Describe how to calculate the work done in raising a 1 kg mass away from Earth.

7. The relationship between the time period, T, and the radius, r, of an
(a) State the factor by which the time period changes when the rad
(b) State the factor by which the radius must change in order to qu

8. The equation for escape velocity, v is $\sqrt{\frac{2GM}{r}}$
Calculate the escape velocity f e face of Earth.

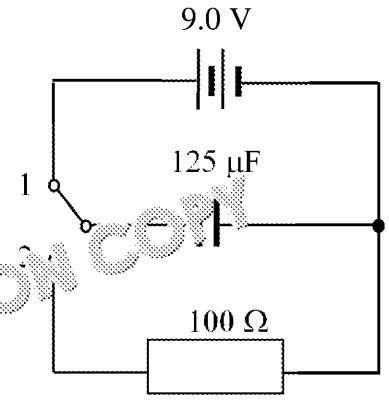
9. Tw t , each of $+3.11 \times 10^{-4}$ C, are isolated in space. C
bet hem for the repulsive force to be 0.25 N.

10. A Van de Graaff generator consists of a charged metal sphere on an in
the sphere is 48 nC. Calculate the electric field strength at a point 35 c
Assume the electric field is radial and the permittivity of air is the sam

11. (a) State Lenz's law.
(b) Explain why a moving coil generator be[illegible] more difficult to

12. Two square parallel [illegible] have a separation of 0.95 m and have
(a) Calcula[illegible] electric field strength between the plates.
(b) [illegible] is held midway between the plates. Calculate the
[illegible] 25 cm closer to the negative plate.
(c) Each plate has a side length of 0.45 m. Assuming that the two
behave as a capacitor, calculate the capacitance of this arrange
of ε_r for air to be 1.00.

13. A 125 μF capacitor is charged to 9.0 V with the switch at position 1



(a) Calculate the charge on the capacitor when it is charged to 9.0
(b) The switch is then moved to position 2.
(i) Calculate the time taken for the charge to drop to half.
(ii) Calculate the charge on the capacitor 0.20 s after moving t

14. A proton moves into a uniform magnetic field of 200 pT with a spe
The direction of the magnetic field is perpendicular to the movemen
the only force acting on the electron comes from the magnetic field
(a) Calculate the force on the electron.
(b) Explain the shape of the path taken by the electron in the magn
(c) State the speed of the electron 1.0 ns after entering the magneti

15. In the UK the mai[illegible] is 240 V.
240 V is th[illegible] voltage.
(a) [illegible] the peak voltage.
(b) [illegible] laptop charger that connects to the mains has an output of 20
required for this laptop charger.

Preview of Questions Ends Here