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

2. Two positive charges, each of charge Q, have an electrostatic force
   separation is r. What is the electrostatic force ~~~een two positive
   when their separation is r?

   A $\dfrac{F}{2}$ **B** ~~F~~   **C** $4F$

3. Wh~~~~these can be used to define the tesla?

   A ma **B** $\dfrac{F}{Il}$ **C** It

4. Which quantity is given by the area under a graph of Q against V fo
   A energy stored   **B** capacitance   **C** current

5. One of the moons of Mars is called Phobos.
   - mass of Phobos = 1.06×10^{16} kg
   - mass of Mars = 6.39×10^{23} kg
   - mean distance from the centre of Mars to the centre of Phobos
   Calculate the mean force holding Phobos ~~~~ it.

6. The value of g at t~~~ f~~~ of the Moon is 1.63 Nkg^{-1}.
   (a) S~~tch~~~ ~~~ or how g varies with increasing distance, r from
   (b) ~~~~ile how to calculate the work done in raising a mass thro
   ~~~ the Moon.

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 ha

8. The equation for escape velocity, v is $\sqrt{\dfrac{2GM}{R}}$

   Calculate the escape velocity from the surface of the Sun.

9. Two point charges, each ~~~~ ~~~ $\times 10^{-6}$ C, are isolated in space. C
   required betwee~~~ ~~~~ the repulsive force to be 0.50 N.

10. A V~~~~ Graaff generator consists of a charged metal sphere on an in
    the sphere is 35 nC. Calculate the electric field strength at a point 30 c
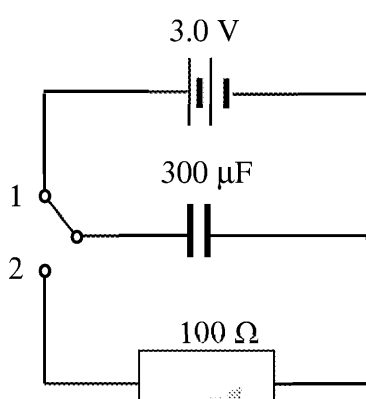   Assume the electric field is radial and the permittivity of air is the sam

11. (a) State Faraday's law.
    (b) Explain why a moving coil generator contains many coils of w

12. Two square parallel metal plates have a separation of 1.20 m and have
    (a) Calculate the electric field strength between the plates.
    (b) One proton is held midway between th... ... Calculate the v
        proton 10 cm closer to the positiv pla...
    (c) Each plate has a side len... ... .85 m. Assuming that the two
        behave as a cap... or. ... ...rate the capacitance of this arrange
        of ... f... ... ...e ...00.

13. A 300 μF capacitor is charged to 3.0 V with the switch at position

3.0 V

300 μF

1

2

100 Ω

    (a) Calculate the charge on the c... ci ...when it is charged to 3.0
    (b) The switch is then m... ... position 2.
        (i) Calcul... ... taken for the charge to drop to half.
        (ii) C... ... the charge on the capacitor 0.10 s after moving t

14. An electron moves into a uniform magnetic field of 100 pT with a s
    The direction of the magnetic field is perpendicular to the moveme
    Assume that the only force acting on the electron comes from the m
    (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 North America the mains voltage is 110 V.
    110 V is the r.m.s. voltage.
    (a) Calculate the peak voltage.
    (b) In the UK, the r.m.s. mains voltag ...s ?4) V. Calculate the rati
        adaptor for people comin... ... No... America to the UK.

Preview of Questions Ends Here