

E-(9/109x10-3/kg)(9.80m/s2)

As the weight of the objective directed clownward, the direction of electric force must be upward. As direction of electric force on negatively charged partical is opposite to the direction of electric field, so, the direction of electric field is downward. Hence magnitude of electric field on electron is 5.58x10-11 N/C and direction is downward.

a) A protorns-

For protorn we know that;

here;

mp = mass of protron.

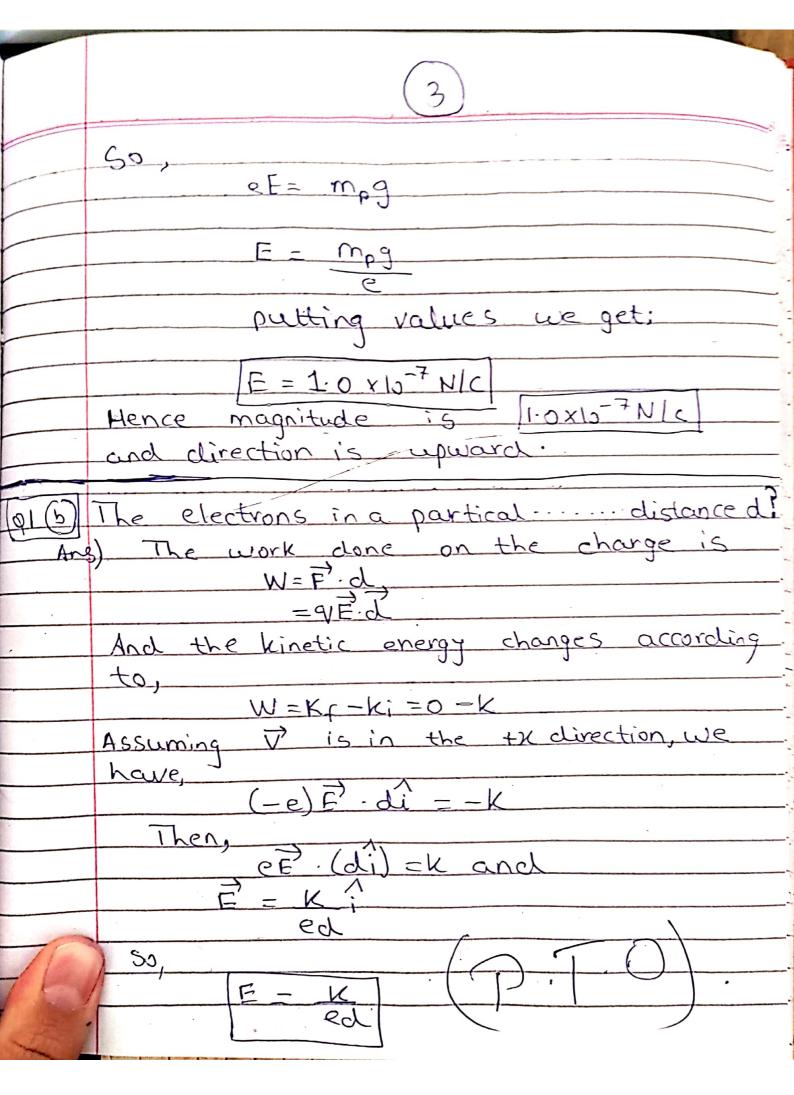
9 = acceleration due to gravity

values are;

mp=1.67x10-27 kg g=9.80m1s²

patting values in (1)

The electric field force acting on proton will be Fe = ef - 2



Direction is in direction of motion because a negative charge experiences an electric force opposite to the direction of an electric field.

of b) consider a where reR. using gauss law, we get; Φ= = \$F. dA - Vin where. The volume of cylinder is

(D3)A) Nobel assertion.

Anst Suppose each person has mass To kg. In terms of elementary charges, each person consists of precisely equal number of protrons and electrons and as needly equal number of neutrons. The electrons comprise very little of the mass, so for each person we find the total number of protorns and neutrons, taken together:

of these, nearly on half, 2×10^{28} us protorns and 100 of this is 2×10^{28} , are constituting a charge of $(2 \times 10^{26})(1.6 \times 10^{-19}c)=3 \times 10^{10}c$.

Thus Fermals for

Thus, Feynan's force has magnitude

F = kequar

putting values.

F = (8.89x69Nm2/c2)(3x107c)2 ~ 626N

where we have used a half meter arm's length. According to the Particle in a gravitational field model, if the earth were in an externally produced uniform gravitational field

(7)
of magnitude 9.80 m/s², it would weigh
Fg=mg
Fg = (6x1024kg)(10m/s2)
2611
Thus the torces are the order of magnitude
03/An infinitely long everywhere.
Dominion of my the electric field everywhere
Ansi-By symmetry, the electric field everywhere is prependicular to the surface of the cylindrical is prependicular to the surface of charge
Shell and point from the centerline of charge
to the outside. So, we break this down into
surface parallel to the cylindrical shell, radius is
and length L.
Case 9: OKYKA In this case, the charge enclosed
would be just due to the line of charge.
Therefore applying Granss's Law, we have.
E(2 TVL) = 4 TKe(K)
whig' which gives $F = 24c\lambda$
Case 2: acreb
(P-T,0)

charge enclosed would include the one forms from the line of charge and the proportion of the charge from the cylindrical shell. The Volume of the charge from the cylindrical shell that would be enclosed by Gaussian surface is

 $V = \overline{\lambda} r^2 L - \overline{\lambda} a^2 L = \overline{\lambda} L (r^2 - a^2)$

Therefore apply Gauss's law

E (2TrL) = 4The (1L+PTL(r2-a2))
which gives

E = 2ke (1+[-(+2-a2))

· Case III g. Y>b

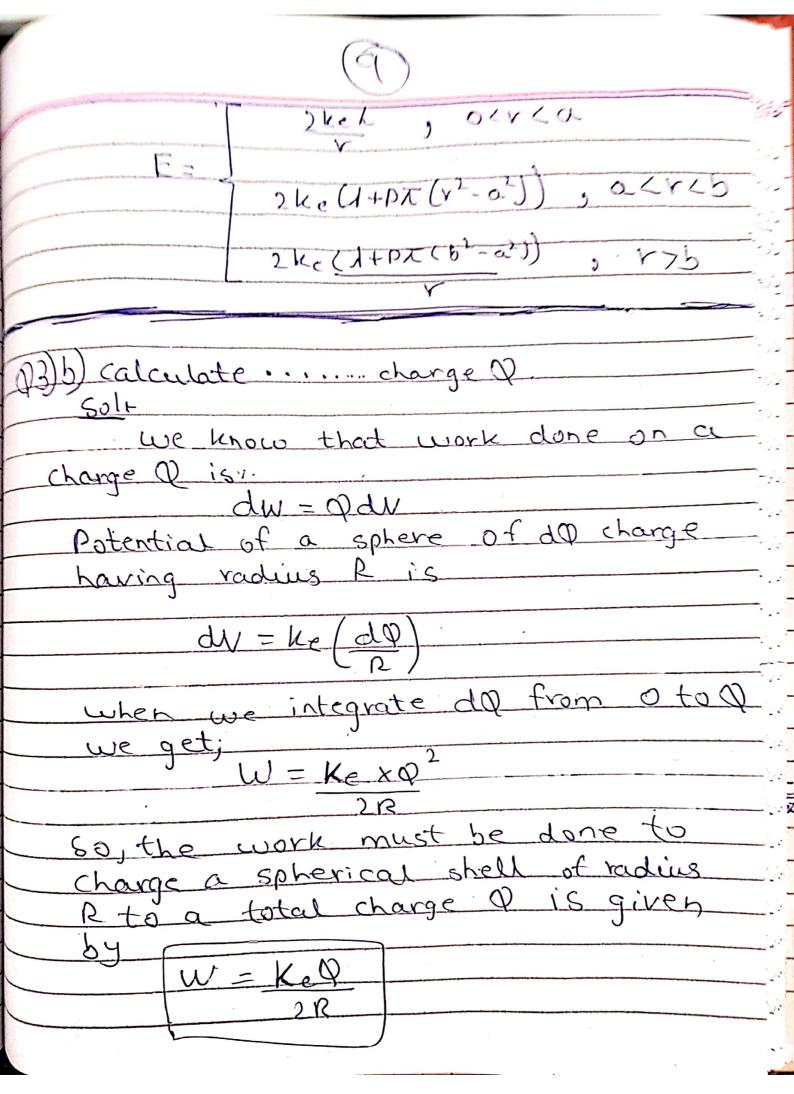
Similar to case 2, we have

E(SILL)=ULKe(M+DIL(82-cz))

which gives

E = 2kc(x+px(b2-a2))

In conclusion.





04)A) A partical having radius	
	::// ::/:
Ansk	
The equipotential surface is a sphere centered at	Siv.
	3/2
(-9 R,0,0)	
The radius is $\sqrt{a^2} = \sqrt{\frac{4}{90}}$	11/2
a-7 4 VR*	100
V97	77.
$a = \sqrt{\left(\frac{2}{3}\right)^2} R$	···
$\alpha = 2 - 0$	· ; ;
3	· · · · · · · · · · · · · · · · · · ·

pylb) show that U=1202/212 ens. Energy stored in a conducting sphere will be in the form of electric potential Energy and will be equal to not working as

$$\int \omega = \int u$$

$$\int \partial u = \int \frac{\kappa \alpha \partial \alpha}{R^{2}} \cdot R$$

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$$= \int u = \frac{\kappa}{R} \int \left(\frac{\alpha^{2}}{2}\right) \left(\frac{\alpha^{2}}{2}\right)$$

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