TOSHKENT KIMYO-TEXNOLOGIYA INSTITUTI

SHAHRISABZ FILIALI

FIZIKA

Fanidan amaliy mashg'ulot

Elektr maydonda bajarilgan ish Potensial. Gauss teoremasi.

Shahrisabz-2020

Bahromova Anzura

1. 15. 2. Q=20 nkl zaryadni maydonning ikki nuqtasi orasida ko’chirishda tashqi kuchlar tomonidan A=4 mk J ish bajarilgan. Maydon kuchlarining ishi A, va maydonning shu nuqtalari orasidagi potensiallar farqi $\Delta\varphi$ aniqlansin.

Berilgan

$Q=20\ nkl=20\cdot 10^{-9}Kl$

$A=4mk\ J=4\cdot 10^{-6}J$

$A_1=?$

$\Delta\varphi=?$

Yechilishi

$A_1=-A=-4\ mk\ J$

$A_1=Q\cdot(\varphi_1-\varphi_2)$

$A_1=Q\cdot\Delta\varphi$

$$\Delta\varphi=\frac{A_1}{Q}$$

$$\Delta\varphi=\frac{-4\cdot 10^{-6}J}{20\cdot 10^{-9}Kl}=-200\ V$$

2. 15.5. Maydonni Q=1 n Kl nuqtaviy zaryad hosil qilgan zaryaddan r= 20 sm uzoqlikda turgan nuqtadagi maydon potensiali aniqlansin.

Berilgan

$Q = 1\ nKl = 1 \cdot 10^{-9}\ Kl$

$r = 20\ sm = 0,2\ m$

$\varepsilon_o = 8,85 \cdot 10^{-12}\ F/m$

$\pi = 3,14$

$\varphi = ?$

Yechilishi

$$\varphi = \frac{Q}{4\pi\varepsilon_o r}$$

$$\varphi = \frac{1 \cdot 10^{-9}}{4 \cdot 3,14 \cdot 8,85 \cdot 10^{-12} \cdot 0,2} = 45\ V$$

15.41. Q=1 mk Kl va Q=0,1 mk Kl nuqtaviy zaryad bir birdan r_1 =10 sm masofada turishibdi. Agar ikkinchi zaryad birinchisidan itarilib undan 1) r_2 =10 m; 2) $r_3 = \infty$ masofaga uzoqlashsa bunda maydon kuchlari qanday A ishni bajaradi?

Berilgan

$Q_1 = 1\ mkKl = 1 \cdot 10^{-6} Kl$

$Q_2 = 0.1\ mkKl = 0.1 \cdot 10^{-6} Kl$

$r_1 = 10\ sm = 0.1\ m$

1) $r_2 = 10\ m$; 2) $r_3 = \infty$

$\varepsilon_o = 8.85 \cdot 10^{-12} F/m$

A=?

Yechilishi

$$A = \frac{Q_1 \cdot Q_2}{4\pi\varepsilon_o r_1} - \frac{Q_1 \cdot Q_2}{4\pi\varepsilon_o r_2}$$

$$A = \frac{Q_1 \cdot Q_2}{4\pi\varepsilon_o} \cdot \frac{r_2 - r_1}{r_1 \cdot r_2}$$

$$A = \frac{1 \cdot 10^{-6} \cdot 0.1 \cdot 10^{-6}}{4 \cdot 3.14 \cdot 8.85 \cdot 0^{-12}} \cdot \frac{10 - 0.1}{10 \cdot 0.1} = 4.004 \cdot 10^{-5} J$$

Topshiriq

1. Q=20 nkl zaryadni maydonning ikki nuqtasi orasida ko’chirishda tashqi kuchlar tomonidan A=**n** mk J ish bajarilgan. Maydon kuchlarining ishi A, va maydonning shu nuqtalari orasidagi potensiallar farqi $\Delta \varphi$ aniqlansin.

2. Bir-biridan d=10 sm masofada turgan ikkita Q_1=100 nKl va Q_2= **n** nKl nuqtaviy zaryadlar tizimining $\prod$ potensial energiyasini hisoblansin.

3. Maydonning muayyan nuqtasiga turgan Q=10 nKl Nuqtaviy zaryad $\prod$=**n** mk J potensial energiyaga ega. Maydonning shu nuqtasidagi potensial φ topilsin.

Izoh**:** **n** sonining o’rniga har bir talaba o’zining jurnaldagi nomerini masalaga qo’yib ishlaydi.