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Method of Controlling and Evaluating Students Knowledge

Nosirov N.B, NortojievA.M. AbdullabekovaD.R.

Tashkent institute of architecture and civil engineering

ABSTRACT. This article argues how to evaluate student's knowledge in a generalized lesson and a method of implementing this option. Key words: generalizing lesson, charging, charged spikes, electric field, electric field strength, potential, completed work.

KEYWORDS: generalizing lesson, charge, charged ball, electric field, electricfield strength, potential, work performed.

I.INTRODUCTION

Accompanied by physicist experiments and physiological experiments, control and evaluation also play a crucial role in strengthening students' theoretical knowledge of physics. We would like to recommend a summary of the "Electric Charge Interaction" below. This writing can be done after completing the relevant chapter in the class of summarizing-repeat lessons to identify and evaluate the level of students' acquisition.

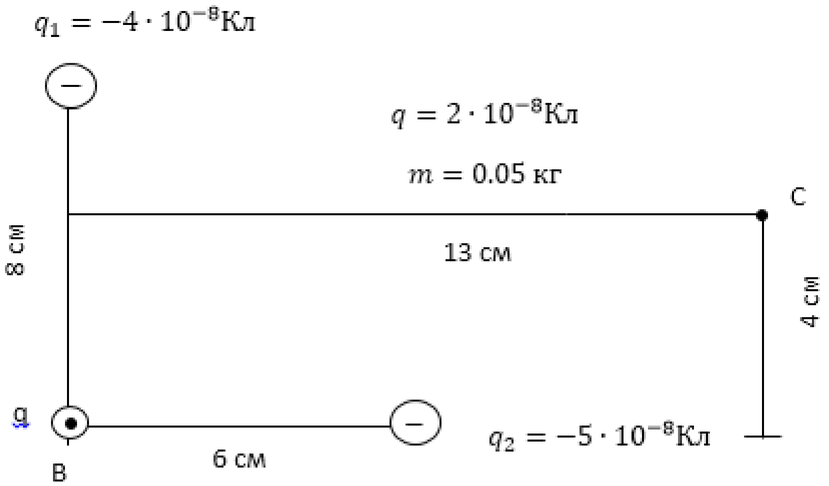
Theoretical knowledge of the students is systematized through the written work option, their skills of applying the vision are shaped. It can be readily available to readers as a dissemination material or as a standalone work (individual choice for each reader). The tasks are given in a logical sequence, and the former helps to determine the next, the results of the first task are used to calculate the required values in the second task, and so on.

In the written form, the task is based on a drawing and eight tasks that must be completed by the reader. Each of these assignments is assigned a score depending on the level of implementation and the degree of difficulty. For each performance, the score is evaluated in the amount shown in the column score in Table 1.

The total score is 10 points, and the student should pay close attention to the drawing during the task assignment and distinguish the given magnitude from it.

The reader works entirely independently, with a teacher's permission to use textbooks, study guides, data sheets and calculations, as well as pencils, pens, and millimeter paper. Below is an example of the sequence of tasks in one of the written work choices.

Electric charges interaction (1-1)



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№	Find the required workout	Grade
1	Explain the magnitude of the charge (q_1, q_2)in the FFC units. Define the distance between center centers. (Note: the distances given in the figure are from the center of the scales).	1
2	How do balls charge in the particles (q_1, q_2) react to each other through the interaction force?	1
3	Place the charging balls and the ***q***-test case in your notebook. Calculate the strength of the electric field at point ***B*** on both chargers and show them the same dimensions. Point the direction of the electric field strength at this point and calculate its final value.	2
4	What power exerted by the electric field of the test battery placed on point ***B***?	1
5	What is the acceleration in the point ***B*** at the point where the charge mass is shown in the picture and the ***q***-test chargeable object?	1
6	Calculate the radius of the wax to 1cm and identify their potential in the kilowatt?	1
7	Calculate the potential of the electric field at points ***B*** and ***C***?	2
8	How do external forces work when moving the q test probe to point **B** and **C**?	1

It is known that the Union of Electricity Chargers (ICU) is 1 Pound (1KL). The unit of the FFC system is 1FFCq The unit of measurement in the International Charter International Payment System (ICU) is known to be 1 Pound (1KL). Its unit in the SGS system is equal. The relationship between the XBS and FFC units systems is $1FFC_q = \frac{1}{3} \cdot 10^{-9} Kl$ equal to δ, and $1Kl = 3 \cdot 10^9 FFC_q$

Write down the values of q1 and q2 of the sheets and represent them in the SGS system.

$$q_1 = -4 \cdot 10^{-8} \cdot 3 \cdot 10^9 FFC_q = -120 FFC_q$$
$$q_2 = -5 \cdot 10^{-8} \cdot 3 \cdot 10^9 FFC_q = -150 FFC_q$$

To determine the distance between the centers of spaces, we define the distance they are located at point ***B***, and use the Pythagorean theorem in mathematics:расмдан $r_1 = 8sm, r_2 = 6sm$it seems to be. From it $r = \sqrt{r_1^2 + r_2^2} = \sqrt{8^2 + 6^2} = 10$ smwe estimate the equality.That meansq_1 andq_2The distance between the balls is 10 cm.

2. The formula of the pendulum is used to calculate the interaction force between chargers:

$F = \frac{1}{4\pi\varepsilon_0\varepsilon} \cdot \frac{|q_1| \cdot |q_2|}{r^2}$ (1) Here,$\varepsilon = 1$ $k = \frac{1}{4\pi\varepsilon_0} = 9 \cdot 10^9 \frac{H \cdot m^2}{Кл^2}$equal. In that case$F = 9 \cdot 10^9 \cdot \frac{4 \cdot 10^{-8} \cdot 5 \cdot 10^{-8}}{0.1^2} = 0.0018H = 1.8mH$

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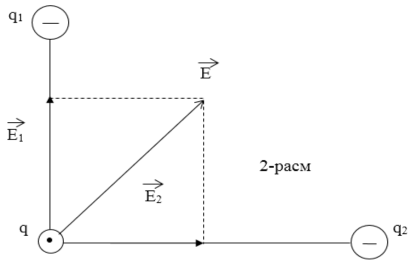
3. q_1 the electric field of the charge at point ***B***. $E_1 = k \cdot \frac{q_1}{r_1^2}$ (2) q_2 charging***B***where the electric field is intensified$E_2 = k \cdot \frac{q_2}{r_2^2}$ (3) is calculated using the formula:$E_1 = 9 \cdot 10^9 \cdot \frac{4 \cdot 10^{-8}}{0.08^2} = 56250 \frac{B}{m} 56.25 \frac{kB}{m}$

$E_2 = 9 \cdot 10^9 \cdot \frac{5 \cdot 10^{-8}}{0.6^2} = 125000 \frac{B}{m} 125 \frac{kB}{m}$Result of electric field strength (E) E_1 andE_2that is, the geometric sum of the$\vec{E} = \vec{E}_1 + \vec{E}_2$ (4). (4) Let's write in brackets, $E = \sqrt{E_1^2 + E_2^2}$(5)

$$E = \sqrt{56250^2 + 125000^2} = 137073.2 \frac{B}{m} = 137.0732 \frac{kB}{m}$$

The directions of electrical field voltages of chargers are shown in Figure 2.



4. ***B***dotted to the point where the test charge is electrically charged$\vec{F} = q\vec{E}$power effects.Its last value$F = 2 \cdot 10^{-8} \cdot 137073.2 = 0.00274H = 2.74mH$to equal.

5. The power mass above is tested as shown in figure 1$\vec{a} = \frac{\vec{F}}{m}$ (7) acceleration may occur. Based on its value,$a = \frac{0.00274}{0.05} = 0.055 \frac{m}{c^2}$is equal.

6. If$q_1$andq_2If we calculate the radius of the globe to 1 cm and calculate their potential,

$\varphi_1 = k \cdot \frac{q_1}{R_1}(8)\varphi_2 = k \cdot \frac{q_2}{R_2}$ (9) we use the formula:

$$\varphi_1 = 9 \cdot 10^9 \cdot \frac{-4 \cdot 10^{-8}}{0.01} = -36000B = -36kB$$

$$\varphi_2 = 9 \cdot 10^9 \cdot \frac{-5 \cdot 10^{-8}}{0.01} = -45000B = -45kB$$

7. $q_1$and$q_2$the potential of the electric field at the point ***B***

$\varphi_1 = k \cdot \frac{q_1}{r_1}$(10) $\varphi_2 = k \cdot \frac{q_2}{r_2}$ (11)can be calculated using the formula:$\varphi_1 = 9 \cdot 10^9 \cdot \frac{-4 \cdot 10^{-8}}{0.08} = -4500B = -4.5kB$

$$\varphi_2 = 9 \cdot 10^9 \cdot \frac{-5 \cdot 10^{-8}}{0.06} = -7500B = -7.5kB$$

The potential of the resulting field at point ***B***$q_2$and$q_2$that is equal to the sum of the charge potentials

$\varphi_1 = k \cdot \frac{q_1}{\sqrt{0.13^2 + 0.04^2}}$ (10) and$\varphi_2 = k \cdot \frac{q_2}{\sqrt{0.07^2 + 0.04^2}}$(11)

can be calculated using the formula:

$$\varphi_1 = 9 \cdot 10^9 \cdot \frac{-4 \cdot 10^{-8}}{0.136} = -2646.8B = -2.6468kB$$

$$\varphi_2 = 9 \cdot 10^9 \cdot \frac{-5 \cdot 10^{-8}}{0.081} = -5581.6B = -5.5816kB$$

The potential of the resulting field at point ***B***$q_1$and$q_2$that is equal to the sum of the charge potentials$\varphi(C) = \varphi_1 + \varphi_2 = -2646.8B - 5581.6B = -8228.34B = -8.23kB$

8. q the test runs from point ***B*** to point ***C***, ie the charge potential$\varphi(B)$potential$\varphi(C)$External forces do the job when moving. This is the case $A = q(\varphi(B) - \varphi(C))$(12) can be calculated from the expression:

$$A = 2 \cdot 10^{-8}(12000 + 8228.34) = -7.54 \cdot 10^{-5}Ж = -75{,}4mkJ$$

II. CONCLUSION

If the teacher has already pre-programmed in the computer program to avoid overwhelming time spent and reusing the above-mentioned accounts, less time will be spent to verify the quality of the students' work, and their

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objective assessment will be even higher. These writing options can be recommended as a methodological guide to pupils and teachers of secondary schools, academic lyceums and vocational colleges.

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