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ELEKTROMAGNETIZM KURSI BO‘YICHA TALABALARNI MUSTAQIL ISHINI TASHKIL ETISH

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Abstract:

In this article, the assessment of independent work of students is carried out in current and interim controls. The Regulation on the procedure for organization, control and assessment of student independent work specifies the tasks of student independent work and its organizational forms.

Keywords:

scientific article, laboratory, practical training, seminar, abstract, practice, thesis, conference, radio device, scheme, consumer.

At present, higher educational institutions pay a lot of attention to the independent work performed by students in the rating system. It is known that assessment of independent work of students is carried out in current and intermediate controls. The Regulation on the procedure for organization, control and assessment of student independent work specifies the tasks of student independent work and its organizational forms.

When organizing a student's independent work, it is recommended to use the following forms, taking into account the nature of the subject, the mastery level and ability of each student:

- Independent mastering of some topics;
- Report preparation;
- Preparation for seminars and practical training;
- Preparation for laboratory work;
- Preparation of scientific articles, abstracts for the conference;
- Applying theoretical knowledge to practice;

Based on the requirements of this Regulation, the form of student independent work and assignment options are developed for each subject taught by the teachers of the higher educational institution.

In this article, one of the methods of organizing the independent work of 2nd-year students studying physics and astronomy on the course of electromagnetism in the form of "practical application of theoretical knowledge" is proposed. In this case, several radio device schemes are recommended for the student to assemble and try and prepare in the form of a ready-made device. It is appropriate to give such schemes to students who have the skills to perform radio installation work. When choosing a radio device scheme, it is necessary to take into account the possibility of its further use in education and other fields.

Below is a scheme of such a radio device that can be given to a student as an independent work.

In secondary schools, vocational colleges and academic lyceums, constant current sources are used to study constant current laws in physics. DC sources usually consist of step-down transformers, rectifiers, and filtering electrolytic capacitors.

Constant current sources can fail when a short circuit occurs during laboratory or practical training. In most cases, a simple fuse cannot be used to protect current sources, because during a short circuit, it takes a certain time to break the circuit, during which time the rectifiers can fail. In such cases, the following "Protection" device can be used to protect DC sources from short circuit.

The "Protection" device is connected between the DC source and the consumer (Fig. 1). The scheme works as follows: If the consumer current is less than the maximum current, the VT2 transistor is open and the voltage drop in it is minimal.

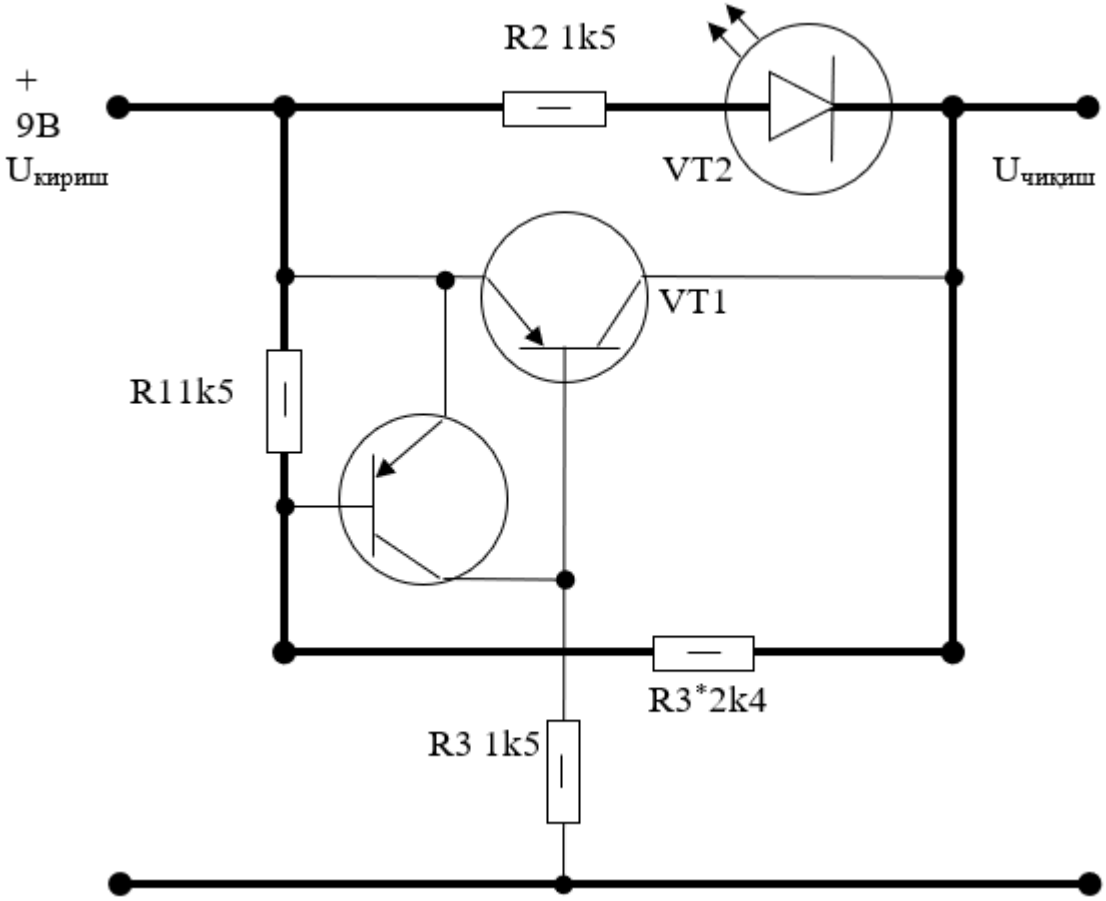

Figure 1. The principle scheme of the "Protection" device.

When the consumer current exceeds the specified value, the voltage drop on the VT2 transistor increases, therefore the amount of voltage applied to the base of the VT1 transistor increases. Transistor VT1 begins to open, the voltage on its collector and at the same time the voltage at the base of transistor VT2 decreases. Transistor VT2 is closed, the voltage drop in it increases, the voltage at the base of transistor VT1 increases even more, and h. Due to the presence of positive feedback through the resistor R4, such a process occurs like an avalanche. As a result, the transistor VT2 is completely closed, the current passing through the light diode VD1 and the current determined by the initial collector

current of the transistor VT2 pass through the consumer. From this, the lighting of the LED VD1 indicates that the protective device has been activated.

After the short circuit is removed, the circuit will automatically reset. For this "Protection" device scheme, Ukir=9V and the installed protection current is 1A.

To change the other parameters of the circuit, the nominal value of the resistor R3 is calculated as follows:

$$R_3 = \frac{U_k \cdot \beta_{cm.}}{I_{макс.}}$$

In this: U_k – input voltage; $\beta_{cm.}$ – VT_2 static transfer coefficient of the transistor; $I_{макс.}$ – shut up maximum heap current.

To start the circuit, instead of resistor R3, variable resistors are used, the resistance of which should be the same as the resistance of resistor R3.

An equivalent resistor designed for the current of the consumer is connected to the output of the circuit.

By connecting the circuit to a constant current source and changing the variable resistor, the maximum protective current is set. Then, instead of the variable resistor, a fixed resistor whose resistance is equal to its resistance is connected.

AL307B type diode is used as VD1 light diode.

It is recommended that this "Protection" device circuit be connected to the source output to protect DC sources from short-circuiting.

After the student collects the scheme of the "Protection" device and prepares it in the form of a ready-made device, it is assigned a rating point for independent work.

Organizing the student's independent work in this way meets the requirements of the Regulation on independent education, increases the student's ability to think independently and understand the essence of issues and creatively solve them.

This "Protection" device can be used to protect constant current sources from short circuit in physics and laboratory classes in secondary schools, vocational colleges and academic lyceums, as well as pedagogical institutes.

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