

英語

第二冊

化自. 由自 75. 79 屈

英 语

ENGLISH

第 二 册

化自、电自 75-79 届

上 海 瑞 贝 工 学 院

一九七八. 十

毛主席语录

Quotations from Chairman Mao

教育必须为无产阶级政治服务，必须同生产劳动相结合。

Education must serve proletarian politics and be combined with productive labour.

古为今用，洋为中用。

Make the past serve the present and foreign things serve China.

为什么语言要学，并且要用很大的气力去学呢？因为语言这东西，不是随便可以学好的，非下苦功不可。

Why do we need to study language and, what is more, spend much effort on it? Because the mastery of language is not easy and requires painstaking effort.

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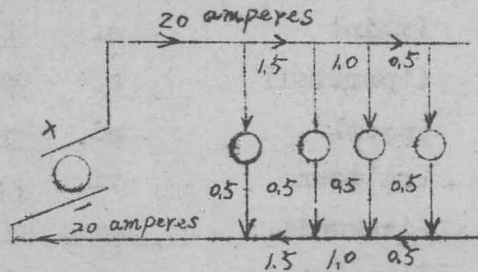
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Lesson Eleven

Parallel Connections

Text

In a parallel connection there is more than one path for the current to flow through so that the current divides, part going through one path and part through another.



The figure above shown 4 lamps connected in parallel to a generator. Part of the current from the generator leaves the main line and flows through the first lamp, part goes through the second, and so on. The current add together again on the return wire so that all the current flows back to the generator. The total current in a parallel circuit is the sum of the currents in the separate paths.

If a voltmeter is connected across each lamp in turn of the above figure, it will read the same for each lamp.

If it is connected across the generator terminals, it will read the same as for any lamp.

When two equal resistances are connected in parallel, the combined resistance is half that of one of the resistances. When three equal resistances are connected in parallel, the combined resistance is one third that of one of them.

Word List

1. above	[ə'baʊ]	ad.	在上面
2. add	['æd]	vi.	加, 加上
3. again	[ə'geɪn]	ad.	再, 又
4. combine	[kəm'beɪn]	vt.	结合, 联合
5. connection	[kə'nekʃən]	n.	连结, 结合
6. half	[hɑ:f]	a.	半, 一半
7. lamp	[læmp]	n.	灯
8. leave	[li:v]	vt.	离开
9. main	[meɪn]	a.	主要的
10. parallel	['pærəlel]	a.	平行的, 并联的
11. part	[pa:t]	ad.	部分
12. return	[ri'tɜ:n]	vi.	回来; 回复
13. second	['sekənd]	num.	第二
14. separate	['sepɪt]	a.	分开的, 各自的
15. show	[ʃəʊ]	vt.	表示, 说明
16. third	[θɜ:d]	num.	第三
17. together	[tə'geðə]	ad.	一起, 一同
18. voltmeter	['vɒltmɪ:tə]	n.	伏特计, 电压表

Flural Forms

lamp	lamps	[læmps]
path	paths	[pɑ:ðz]
resistance	resistances	[rɪ'zɪstənsɪz]

Verb Forms

combine	combined	[kəm'beɪnd]
connect	connected	[kə'nektɪd]
divide	divides	[dɪ'vaɪdɪz]
leave	leaves	[li:vz]
show	shows	[ʃəʊz]

Expressions

- | | |
|------------------------------------|--------|
| 1. parallel connection | 并联连结 |
| 2. for the current to flow through | 让它流通过 |
| 3. so that | 所以, 因此 |
| 4. in parallel to | 与...并联 |
| 5. the main line | 干线 |
| 6. and so on | 等等 |
| 7. the return wire | 回线 |
| 8. flow back to | 流回到 |
| 9. in turn | 依次 |
| 10. read the same | 读数相同 |

Note to the text

1. Part going through one path and part through another
部分通过一个通道, 部分通过另一通道。

Learn to Speak

Revolution means liberating the productive forces
and promoting their growth.

革命就是解放生产力, 就是促进生产力的发展。

- | | | | |
|---------------|---------------|-------|--------|
| 1. mean | [mi:n] | vt. | 意味着 |
| 2. liberate | ['libereit] | vt. | 解放 |
| liberating | ['libereitiŋ] | | |
| 3. productive | [pre'dektiv] | a. | 生产的 |
| 4. promote | [pre'mout] | vt. | 促进 |
| promoting | [pre'moutiŋ] | | |
| 5. their | [ðeə] | pron. | 它们的 |
| 6. growth | [grəʊθ] | n. | 生长; 增长 |

Grammar

非谓语动词

英语实义动词在句中可以单独作谓语，也可以和助动词或情态动词一起构成谓语，这种动词叫做谓语动词。动词也可以不作谓语，而在句中作主语、定语、宾语、状语等；这种动词叫做非谓语动词。

非谓语动词有三种：1. 不定式 2. 分词 3. 动名词

(一) 动词不定式

I. 不定式的构成

不定式是一种非谓语动词，由不定式的标记“to”加动词原形构成。这个“to”不是介词，而是不定式的特有标记，本身没有词汇意义，例如：

原形动词	动词不定式
flow	to flow
provide	to provide
be	to be

II. 不定式的特征

不定式具有名词、形容词或副词的作用，可以作句子的主语、定语、状语、宾语、表语等各种成分。不定式仍然保留某些动词的特点，如可以有自己的宾语、状语等。不定式和它的宾语、状语一起构成不定式短语。

a. A variable resistor uses a shaft to control the resistance value.

可变电阻利用一根轴来调节阻值（带宾语）

b. Ohm is the unit to be used for the measurement of resistance.

欧姆是用来测量电阻的单位。（带状语）

III. 不定式及不定式短语的用法

1. 作主语

a. To study Chairman Mao's works hard is very important.

认真学习毛主席著作很重要。

- b. To use different units for the measurement of electric quantities is necessary.

用各种单位来测量电量是必要的。

不定式短语在句中作主语时，往往放在谓语动词的后面，而在句首用“it”作形式主语，在这种情况下，“it”本身无意义。上述两句可改为：

- a. It is very important to study Chairman Mao's works hard.
b. It is necessary to use different units for the measurement of electric quantities.

2. 作定语

- a. There are two ways to classify resistors.

有两种划分电阻的方法

- b. Ohm is the unit to be used for the measurement of resistance.

欧姆是用来测量电阻的单位。

3. 作状语：

- a. We use switches to close or open circuits.

我们用开关来闭合或断开电路。

- b. A variable resistor uses a shaft to control the resistance value.

可变电阻利用一根轴来调节阻值。

4. 作表语

- a. The most important thing is to give first place to proletarian politics.

最重要的事情是把无产阶级政治放在首位。

- b. One of the main functions of semiconductor materials is to maintain a constant temperature.

半导体材料的主要作用之一就是保持恒温。

5. 作宾语

Electronics technology continues to find wider and wider applications in industry.

电子技术在工业上不断获得越来越广泛的应用。

IV. 带 for 的不定式结构

for + 名词或代词 (宾格) + 不定式

这种结构在句中也可以作主语、表语、定语、状语等。如：

a. It is difficult for electrons to move through insulators.

电子很难通过绝缘体。(主语)

b. For current to flow, all parts of the circuit must be connected.

为了让电流流通, 线路的各部分必须连接好。(状语)

c. A circuit provides a path for current to flow.

电路是一条让电流流过的通道。(定语)

V. 不定式的被动式

不定式可以有主动式和被动式, 如: "to use" (主动),

"to be used" (被动), "to provide" (主动), "to be provided" (被动) 等。

不定式的被动式由 "to be + 过去分词" 构成, 如:

a. A transistor to be made in this way is called a junction transistor.

这样制成的晶体管叫做面结型晶体管。

b. Ohm is the unit to be used for the measurement of resistance.

欧姆是用来测量电阻的单位。

Exercise to Grammar

指出下列句子中不定式短语的作用，并把句子译成中文：

1. Since it is often desirable to open or close a circuit, nearly all circuits contain some form of a switch.
2. An adjustable resistor uses a sliding contact to provide the required value.
3. Resistance is the property of a material to oppose the flow of electric current. (to oppose the flow of electric current 阻碍电流流通)
4. An AC-DC switch prepares the meter for the type of voltage or current to be measured.
5. It is difficult for current to flow through insulators.
6. When there are two or more sources having different voltages and polarities, the key for determining the total voltage is to find the potential difference between them.

Exercises to the Text

I. Substitution drill

1. in a parallel connection

Do the same with

series

series-parallel

2. more than one path

Do the same with

figure

generator

3. for the current to flow through

Do the same with

go

pass

4. the figure above

Do the same with

below

on the left (right)

5. connected in parallel to a generator

Do the same with

motor

machine

6. flow back to the generator

Do the same with

circuit

resistor

7. the total current in a parallel circuit

Do the same with

series

series-parallel

8. in the separate paths

Do the same with

lamps

circuits

9. connected across each lamp

Do the same with

motor

generator

10. half the resistance

Do the same with

one second

one third

II. Give the missing words

1. In a _____ connection there _____ more _____ one path for the current to _____ through so _____ the current _____, part _____ through one path and part _____ another.
2. The figure _____ shows 4 lamps _____ in _____ to a generator. Part of the current _____ the generator _____ the main line and flows through the first lamp, part _____ through the _____, and _____ on.
3. The current _____ together again _____ the return wire so _____ all the current _____ back to the generator. The total current in a _____ circuit is the _____ of the currents in the _____ paths.
4. If a voltmeter is _____ across each lamp in _____ of the above figure, it will _____ the same _____ each lamp. If it is connected _____ the generator _____, it will _____ the _____ as for any lamp.
5. When two _____ resistances are _____ in _____, the combined resistance is _____ that of one of the resistances. When three equal _____ are _____ in _____, the combined resistance is one _____ that of one of them.

III. Translate to Chinese

- | | |
|-------------------------|--------------------------|
| 1. is equal to | 2. so that |
| 3. and so on | 4. flow through |
| 5. in turn | 6. can be found |
| 7. end to end | 8. go through |
| 9. potential difference | 10. electrical component |

IV. Read at more length

Cells are connected in parallel when the current is divided between the various cells. In the normal parallel connection of cells all the positive poles are connected together and all the negative poles are connected together. Connection is made to an external resistor from the positive and negative terminals at any point along the wires connecting the various cells. (see Fig. 1)

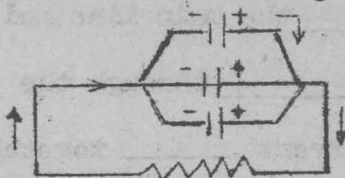


Fig 1. Cells in Parallel

For a parallel arrangement of ⁿ identical cells, the following statements are true:

1. The e.m.f. of the battery is the same as the e.m.f. of a single cell.
2. The reciprocal of the total internal resistance is equal to the sum of the reciprocals of the resistances of the individual cells.
3. The current in the external circuit is divided equally among the cells.

Notes:

1. the wires connecting the various cells

连接各个电池的导线。

2. the following statements are true

下面的说法是对的 (适用的)。

II. Resistance in Parallel

A parallel circuit is one in which one terminal of each element is connected to a common point to form one terminal of the system, and the other terminal of each element is connected to a second common point to form the other terminal of the system. Under these conditions, each element of the parallel system is across the same voltage, but the total current divides among the elements of the circuit. A parallel circuit of three resistances is shown below.

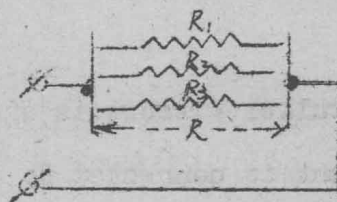


Figure. Resistances in parallel

With resistances in parallel the total equivalent resistance must always be less than that of any one of the single resistances, since the addition of a resistance in parallel with another resistance increases the available current path and hence decreases the resistance to current flow.

The equivalent of resistances ⁱⁿparallel may be determined

directly if they are first considered as conductances. Thus, in the figure above, are shown three resistances R_1, R_2, R_3 , in parallel. Their conductances are G_1, G_2, G_3 , where

$$G_1 = 1/R_1, G_2 = 1/R_2, G_3$$

If R is the total equivalent resistance, $G = 1/R$ and equation may be written

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

That is:

In a parallel circuit, the reciprocal of the equivalent resistance is equal to the sum of the reciprocals of the individual resistances.

Notes:

1. A parallel circuit is one in which one terminal of each element is connected to a common point to form one terminal of the system, and ...

并联电路是这样一种电路：把每个元件的一端接成共同端作为这个装置的一个接端。

2. with resistances in parallel

当电阻并联时

3. less than that of = less than the resistance of

比...的电阻小

4. Thus, in the figure above, are shown three resistances in parallel.

所以，上图三个电阻是并联

Lesson Twelve

The Transformer

Text

In electric system it is often necessary to change the voltage of alternating currents. With the transformer, AC voltage can be changed at one's will.

Usually the transformer has two windings electrically insulated from each other. They are wound on a common closed core made of silicon-steel laminations. The winding which receives electric power is called primary winding and the other is called the secondary winding.

If the secondary winding has a number of turns greater than that of the primary, the secondary voltage will be higher than the primary voltage, such a transformer is a step-up transformer. On the contrary, if the secondary number of turns is smaller than that of the primary, the secondary voltage becomes less than that of the primary. Such a transformer is a step-down transformer. In fact, the voltages are directly proportional to the number of turns of windings. With this principle in mind we can design any kind of transformer with a suitable selection of numbers of turns.