科技英语的特点和应用

练习答案

EST—FEATURES AND APPLICATION

KEY TO THE EXERCISES

上海外语教育出版社

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上海外语教育出版社出版
（上海东体育会路 166 号）
上海市印刷三厂印刷
新华书店上海发行所发行

787×1092 毫米　1/16　3.75 印张　80 千字
1984 年 1 月第 1 版　1984 年 1 月第 1 次印刷
印数 1—38,000 册
统一书号：7218·096　　定价：0.40 元

Chapter I

The Concept of EST

Exercise A

1. EOP 2. EAP 3. EST 4. EOP

Exercise B

1. W 2. S 3. S

Exercise C

1. S 2. C 3. C

Chapter II

Scientific Statements

Exercise A

When a kettle of water is boiled, steam can be seen coming out of the spout. This is because water vapour is given off by the boiling water, and is visible only as steam. The water in the kettle decreases because it is being converted into vapour. In other words, it is vaporizing or evaporating. It cannot evaporate in the absence of heat.

If a cold surface is held in the steam, droplets of water can be seen forming on it. This is because the water vapour is cooled on touching the cold surface, and is converted into liquid water. This process is known as condensation.

Clouds are made by water vapour. By the aid of sun's heat, water evaporates from the earth's surface, and, on meeting a body of cold air, this water vapour condenses in the form of millions and millions of droplets of water. These may combine until they are heavy enough to be precipitated.

Exercise B

1. general statement; 2. general statement; 3. particular statement;

4. classification; 5. general statement; 6. general statement;
7. description; 8. definition; 9. assumption;
10. particular statement; 11. general statement; 12. definition:
13. hypothesis; 14. general statement; 15. particular statement

Exercise C

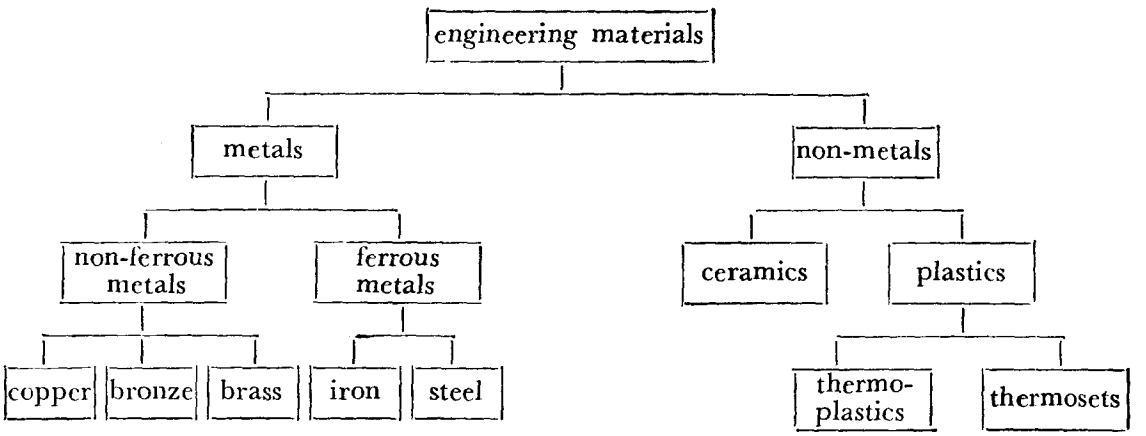
1. Acceleration; 2. Rate; 3. Time; 4. Vector; 5. Velocity;
6. Weight; 7. Gravity; 8. Force; 9. Mass; 10. Distance

Exercise D

1. A catalyst accelerates a chemical reaction.
2. Automatic frequency control controls the average radio frequency of a frequency modulation receiver.
3. Elements cannot be broken down into anything simpler by chemical means.
4. A neutron has the same mass as a proton but carries no electrical charge.
5. Kinematics deals with the motion of bodies without considering the forces which produce such motion.

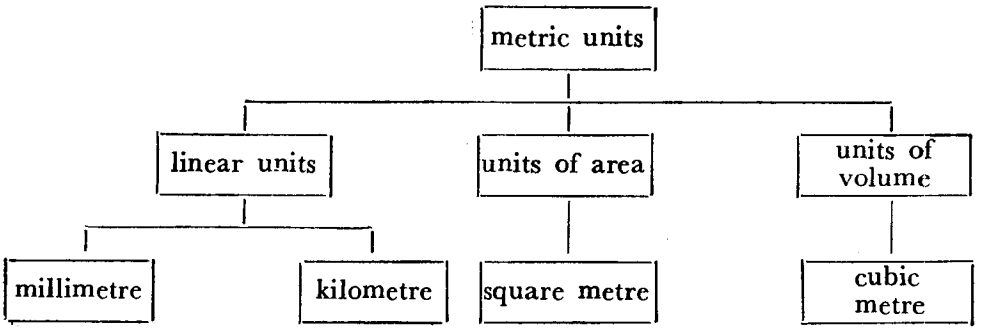
Exercise E

1.



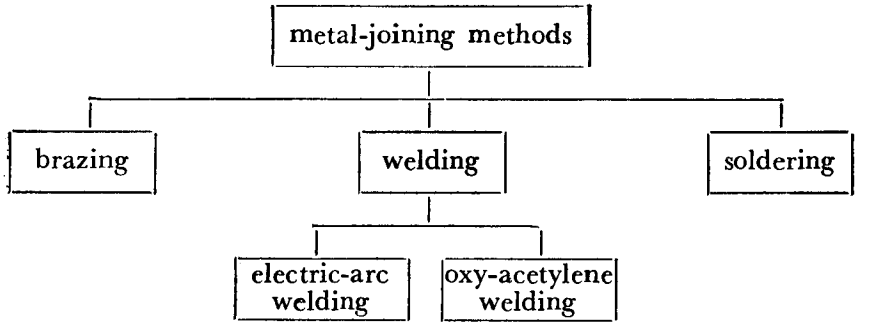
Engineering materials can be classified as non-metals and metals. Non-metals can be classified as plastics and ceramics. Thermosets and thermoplastics are examples of plastics. Metals can be classified as ferrous metals and non-ferrous metals. Iron and steel are examples of ferrous metals, while copper, bronze and brass are examples of non-ferrous metals.

2.



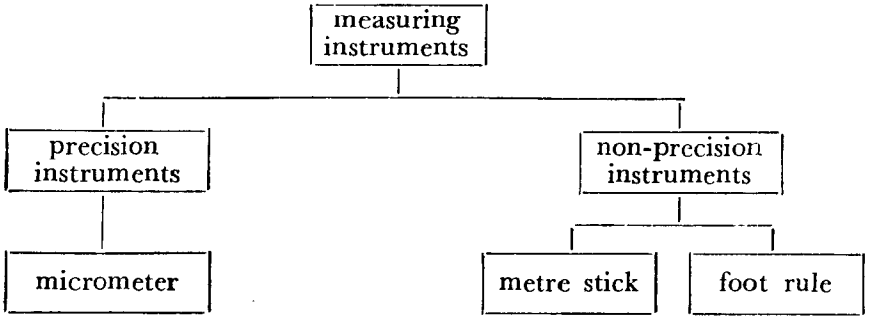
Metric units can be classified as units of volume, units of area and linear units. Cubic metre is an example of units of volume, and square metre is an example of units of area, while millimetre and kilometre are examples of linear units.

3.



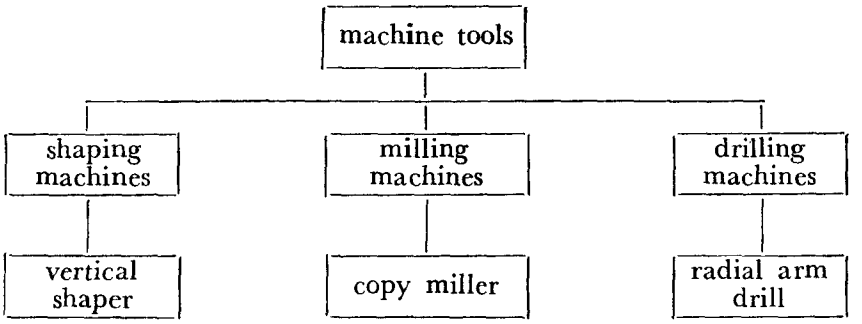
Metals-joining methods can be classified as soldering, welding and brazing. Oxy-acetylene welding and electric-arc welding are examples of welding.

4.



Measuring instruments can be classified as non-precision instruments and precision instruments. Metre stick and foot rule are examples of non-precision instruments. Micrometer is an example of precision instruments.

5.



Machine tools can be classified as drilling machines, milling machines and shaping machines. Radial arm drill is an example of drilling machines, and copy miller is an example of milling machines, while vertical shaper is an example of shaping machines.

Exercise F

	Component	Shape	Material
1			alcomax
2	pole pieces		
3		cylindrical	soft-iron
4		rectangular	
5	pointer		
6	hair springs		

Exercise G

1. 1) f; 2) t; 3) t; 4) f; 5) f; 6) f; 7) f; 8) t; 9) t; 10) t
2. 1) b; 2) a; 3) c; 4) a; 5) b; 6) c

Sample Passage: The Engineering Profession

True or False

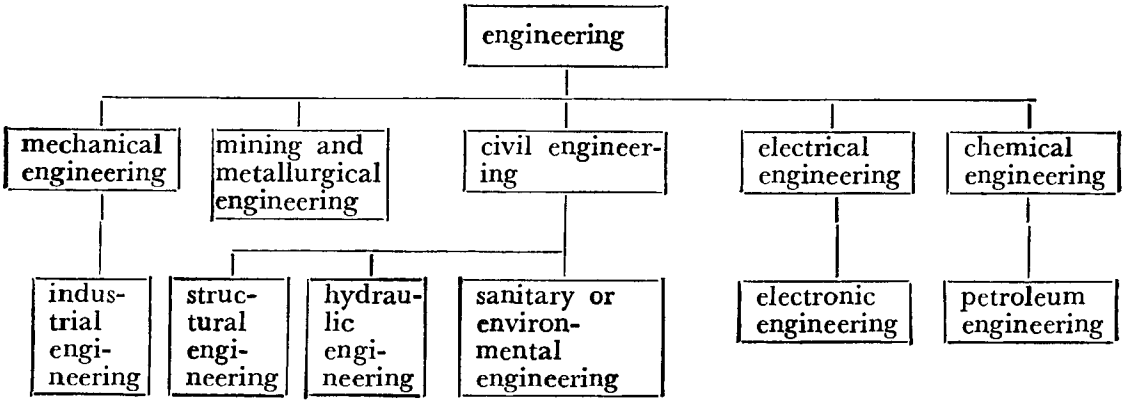
1. t; 2. f; 3. t; 4. t; 5. t; 6. f; 7. t; 8. f; 9. t; 10. f; 11. t

Key Points

1. 1) Industrial; 2) Inclined plane; 3) empirical information; 4) Mechanical engineering; 5) quantification; 6) Petroleum engineering; 7) aerospace engineering
2. 1) Systems engineer coordinates the work of other engineers from different disciplines who are involved in one project.

2) Nuclear engineering deals with the processes resulting from the break-up of some particles of matter.
3) Profession requires specialized education at the university level.
4) Chemical engineering deals with processes involving reactions among the chemical elements and compounds.
5) Wedge is used for tightening or levering.

3.



Exercise H

1. This is a main statement plus evidence.
2. This is a main statement plus repetition.
3. This is a main statement plus an illustration.
4. This is a main statement plus illustrations.
5. This is a main statement plus evidence.
6. This is a main statement plus evidence.
7. This is a main statement plus repetition.
8. This is a main statement plus evidence.

Exercise I

1. c; 2. f; 3. a; 4. c; 5. d; 6. g; 7. b

Sample Passage: Pasteurization

True or False

1. f; 2. t; 3. t; 4. t; 5. f; 6. f; 7. f; 8. f; 9. t; 10. f

Key Points

1. illustration; 2. evidence; 3. repetition; 4. evidence; 5. evidence

Exercise J

1. The concluding statement is: Each worker needed to learn only one or two routine tasks.
2. The concluding statement is: With the increased production made possible by the assembly line, automobiles became much cheaper, and more and more people were able to afford them.
3. No.

Sample Passage: Sources of Error in Scientific Investigation

True, False or Not Mentioned

1. f; 2. t; 3. t; 4. f; 5. t; 6. f; 7. t; 8. f; 9. t; 10. f;
11. n; 12. t; 13. t; 14. t; 15. f; 16. t

Key Points

From the very simple example of the flat tyre we have seen that the scientific method is not only used by a few people called scientists, but something which we can all use with advantage. But patience and hard, careful work are necessary to reach the truth.

Exercise K

1.

1. Main Statement
2. — Evidence
3. — Repetition

2.

1. Main Statement
2. — Evidence
3. — Evidence
4. — Evidence
5. Main Statement
6. Conclusion

3.

1. Main Statement
2. — Illustration
3. — Evidence
4. — Evidence
5. — Evidence

Sample Passage: Population and Food

True or False

1. t; 2. t; 3. f; 4. t; 5. f; 6. t; 7. f; 8. f; 9. t; 10. t; 11. t; 12 f

Key Points

1.

Main Statement
- — Evidence
- — Evidence
- — Repetition

Conclusion

2.

Main Statement
- — Evidence
- — Illustration

3.

Main Statement
- — Evidence
- — Evidence
- — Evidence

Chapter III

Meaning Relationships and Meaning Links

Exercise A

1. There are meaning relationships.

2. There are no meaning relationships.
3. There are meaning relationships.
4. There are meaning relationships.
5. There are meaning relationships.
6. There are meaning relationships.
7. There are meaning relationships.
8. There are no meaning relationships.
9. There are no meaning relationships.
10. There are no meaning relationships.

Sample Passage: Vitamins

Toward Interpretation

1. C; 2. C; 3. A; 4. C; 5. A; 6. A; 7. B; 8. D; 9. B; 10. A

True or False

1. f; 2. t; 3. t; 4. t; 5. f; 6. f; 7. t; 8. f

Key Points

1. the pronoun: (many of) them
2. the repetition of the noun; (these) elements
3. the word group: for example
4. the pronoun: he

Exercise B

they; It; It; Its; It; It; they; They; their; It; They; they; they; they; they

Exercise C

1. switch; switch; switch; Switches; Small switches; Larger switches; Other switches; switches
2. pylons; wires; Aluminium; Large current; thin wires

Exercise D

1. A; The; the; The; a; The; The
2. a; a; The; the; The; The; the; the; A; the; The; the; The; the; The; The

Exercise E

1. effect;	2. combination;	3. theory;	4. basic physical law;
5. statement;	6. situation;	7. fact;	8. knowledge

Exercise F

1. Large quantities of steam ... of power. Therefore, it is necessary to ...as efficiently as possible.
2. In practice the work output ... in overcoming friction. Thus, the efficiency ... can never reach 100%.
3. The heating of iron and steel ... on the heated surfaces. For this reason a flux ... the heated metal.
4. When the automobiles ... broke up the smooth road surfaces. Therefore, the top layer ... with tar or asphalt.
5. There are two kinds of particles ... and therefore is neutral. For this reason it is called neutron.
6. Civil engineering projects ... own problems and design features. Therefore, careful study ... before design work begins.
7. To produce fusion ... are needed. Thus, to set off an H-bomb ... is required.
8. Double-acting engines ... i.e. a lower weight and bulk. As a consequence, double-acting engines are cheaper to produce. For these reasons, the development ... towards double-engines.

Exercise G

1. When a plane is travelling ... can speed on ahead of the plane. But when the plane increases ... with the sound waves.
2. About two hundred and seventy years ago ... 'For every action, there is an equal and opposite reaction.' Yet no one could be more surprised ... in demonstration of this basic physical law.
3. The gasoline engine ... and numerous other parts. In contrast, the turbine engine is rather simple.
4. All of the different kinds of radiation ... a combination of two kinds of radiation. Nevertheless, any kind of radiation ... who are exposed to it.
5. A modern method of producing ... the same manufacturing technique is used. However, the thin-film deposition process ... on the surface. Instead it uses material ... within the substrate.

Exercise H

Usually there is more of one metal than of the other in an alloy. For example, bronze consists of copper with about one part in ten of tin.

Most alloys are made by mixing together metals which have been melted. Some alloys are difficult to make because the metals in them have different melting points. For example, brass is an alloy of copper and zinc. Copper melts at a temperature of 1,083 °C

and zinc at 419 °C. The latter boils at 907 °C. We cannot make brass simply by heating pieces of copper and zinc together to a temperature of over 1,083 °C.

In some alloys the metal with the higher melting point forms a smaller part of the alloy than the metal with the lower melting point. For example, there is a light alloy which contains 92% aluminium (melting point 660 °C.) and 8% copper (melting point 1,083 °C.). It is not possible to make this light alloy by melting first the small part of copper and then adding the much larger part of aluminium.

To make a strong alloy it is not always necessary to use two strong metals. For example, copper and aluminium are both fairly weak metals. But if the correct proportions of copper and aluminium are blended together, a strong alloy is produced. If 5% of the aluminium is added to 95% of copper, the alloy produced is twice as strong as copper.

Exercise I

1. When you put a drop of oil ... than when they are dry. In the same way, oil between the moving engine parts ... or move easily.
2. When you turn the light or appliance off ... no current will flow. In a somewhat similar way, a water system works.
3. The metal chassis ... to conduct current. Similarly, the body of a car ... its electrical transmission system.
4. When you turn off a faucet, ... through the faucet. Similarly, when you turn off ... no current flows.
5. Electrons orbit around the center ... of the atom. In a somewhat similar way, the planets ... around the sun.
6. In a transformer, ... causes electrons (or current) to flow in the secondary winding. In very nearly the same way, the radio broadcasting station ... in the radio receiver.

Exercise J

1. An atom of the gas chlorine ... to form a molecule of sodium chloride. Practically, everything we see about us ... from the atoms of the different chemical elements.
2. By the first half of the sixteenth century, ... to the making of medicines. In particular, they sought a fanciful substance ... as 'the philosopher stone'.
3. Modern industry ... of iron and steel. Indeed, a certain number of ... are also important to industry.
4. After years of work ... did not look very impressive. In fact, it was so small ... to see it.
5. The fact that the basic carrier wave ... to carry a great deal of information. In

effect, each wave ... a large amount of information can be carried.

6. There are three types of airstream reaction engines ... is the simplest of the three. Essentially, it ia a long tube ... at the front end.
7. The word 'serendipity' was first used ... without looking for them. Of course, discoveries by chance ... before Mr. Walpole invented the word.
8. Integrated circuits ... advantages. Above all circuit reliability is greatly increased.
9. There would be no rubber ... no rubber tips on pencils. True, there are synthetic rubber products ... still provides for two thirds of our needs.
10. Men learned how to make fire ... how to refine iron and other metals. Certainly, it took many weary centuries ... in these different ways.

Exercise K

1. The driver of the electric car ...after he has used his car. Alternatively, he can simply exchange ... at a garage.
2. Radioactive materials ... how the glands and organs of our bodies function. Further, they can help ... and cure different dieseases.
3. The names of the men ... and experimented with light, electricity, and radio. Besides, it would certainly include the names ... to create the marvel of television.
4. A body is in stress ... which causes its size and shape to change. In other words, stress causes distortion.
5. The procedure the computer has to go ... all this can take place almost instantly. Furthermore, far more complicated computations ... at extremely high speed.
6. If we make a graph to compare ... with the circumference. In addition, we can use the graph ... rather like a simple computer.

Exercise L

What are magnetic lines of forces ? Probably you have already experienced with such an experiment. Put a piece of glass on top of a horseshoe magnet, and then sprinkle iron filings on the glass. The filings will arrange themselves into lines, which scientists call magnetic lines of force. Probably electrons seem to have magnetic lines of force around them, too.

This can be proved by striking a wire through a piece of cardboard, sprinking iron filings on the cardboard, and connecting a battery to the wire. The filings will tend to form rings around the wire, as a result of the magnetism of the moving electrons. Of course, electrons are not really 'flowing' in the bar magnet, but they are in motion, circling the nuclei of the iron atoms. However, in the magnet, the atoms are lined up in such a way that their electrons are circling in the same direction. Perhaps, a good comparison might be a great number of boys whirling balls on strings in a clockwise direction around their heads.

Exercise M

Electrical energy is generated at power stations at 25 KV. First it is stepped up by a transformer to 132 KV, 275 KV or 400 KV for long distance distribution. Next it passes via the switching compound to the grid. Then it is distributed via the grid system to the main grid supply points where it is stepped down to 33 KV for distribution to heavy industry. Then it is distributed via overhead or underground cables to intermediate substations where it is further reduced to 11 KV for light industry. After that it is fed to distribution substations where it is reduced to 415 V, 3-phase and 240 V, 1-phase. Finally it is distributed to the domestic consumer.

Exercise N

To conclude, it would not be fair to claim that more accomplishments may have occurred by accident than as the result of planned work. This claim would argue against any sort of advance planning. Scientists would conduct experiments with no idea of what they were seeking or of what was needed. True serendipity consists of being watchful and ready to profit from the serendipitous accident of discovery when — and if —it does come.

Sample Passage 1: A Robot about the House

True or False

1. t; 2. t; 3. f; 4. t; 5. f; 6. f; 7. t; 8. t; 9. f; 10. f;
11. t; 12. t; 13. t; 14. f; 15. f

Key Points

1. 1) it — civilization; 2) It; it — a domestic robot;
   3) them — housewives; 4) It — the machine
2. 1) Basically; 2) then; 3) But; 4) However; 5) For example;
   6) In other words

Sample Passage 2: The Laws of Nature

True or False

1. t; 2. t; 3. f; 4. t; 5. t; 6. t; 7. t; 8. f; 9. f; 10. f;
11. t; 12. t; 13. f; 14. f; 15. t; 16. f; 17. f; 18. t; 19. t; 20. t

Key Points

2. 1) similarly; 2) However; 3) But; Thus: 4) Certainly; 5) On the contrary

Sample Passage: 3: Nuclear Fission

True or False

1. t; 2. f; 3. t; 4. f; 5. t; 6. t; 7. t; 8. f; 9. f; 10. t; 11. t; 12. f; 13. f; 14. f; 15. t

Key Points

1. 1) a summarizing noun; 2) neither a summarizing noun, nor the summarizing pronoun 'This'; 3) the summarizing pronoun 'This'; 4) the summarizing pronoun 'This'
2. 1) Indeed; 2) in other words; 3) Therefore; 4) However; 5) For instance

Chapter IV

Features of EST in Style and Structure (I)

Exercise A

1. 1) After passing through the pupil, the light ray enters the lens.
   2) After using an electrical instrument, you should always make sure that it is switched off.
   3) —
   4) Before signing off, the operator repeats his call sign.
   5) —
   6) — (On landing, the aircraft exploded.)
   7) On being hammered to shape, a wrought iron bar spreads out without cracking.
   8) After being heated to dull red, the metal is allowed to cool slowly in sand.
2. 1) Before entering factories or laboratories, wear safty shoes.
   After wearing safty shoes, enter factories or laboratories.
   2) After switching on, allow a few minutes to warm up.
   Before allowing a few minutes to warm up, switch on.
   3) Before working with a file, choose a file with a handle on the tang.
   After choosing a file with a handle on the tang, work with this file.
3. 1) After starting the object moving, a force is required to keep it moving.
   2) When touching an electrified metal object with the hand, the charge flows through one's body to the ground.
   3) Before applying heat for a weld, the plates should be clamped together.

4) When using superheated steam, compounding becomes less effective.
5) When drilling deep holes, the feed movement should be released from time to time.
6) While making an efficiency test on an engine, certain precautions should be observed.
7) After reading the book, a summary should be made for the important chapters.
8) When pushing the button of an electric doorbell, the electric circuit will be closed.

4. 1) The melting of iron requires a very high temperature.
2) The sudden heating of the air by lightning flashes causes thunder.
3) Being made of copper, thin wires easily melt.
4) Visiting the moon would enable us to see the earth.
5) Eating no salt might (would) cause us feel not well.
6) At the sea level, for example, the air presses upon us with a weight of about fifteen pounds per square inch. Holding out your hand and trying to feel this weight will cause you to be disappointed.

Exercise B

1. The latex treated with acid is then dried.
2. Supplies of rubber required by industry came from far away.
3. The steel obtained in this way is suitable for machine tools.
4. The only fissionable material found in nature and used extensively is uranium-235.
5. The research carried out on this subject is extensive and meaningful.
6. The steam extracted from the turbine is passed through a condenser.
7. The wings have controllable sections, known as ailerons.
8. The manufacturing process adopted last year was a revolutionary one.
9. Generators not required for service now are kept in good care.
10. Heat is the energy produced by the movement of molecules.

Exercise C

1. 1) The driving belt, which transmits power to the pulleys, is 9 mm thick.
2) The towers, weighing a thousand tons each, support the main section of the bridge.
3) The lines carrying the supply are arranged in two groups.
4) Grooving tools, which cut slots or keyways, are made of high-speed steel.
5) The main shaft of the lathe drives the lubricant pump, which supplies cooling fluid at the tool cutting tip.