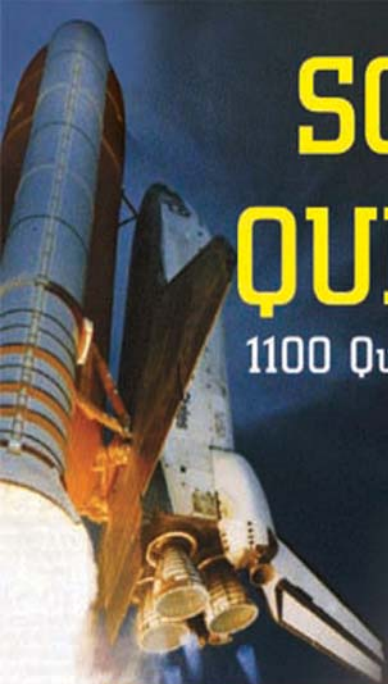


# SCIENCE QUIZ BOOK

1100 Questions and Answers



V&S PUBLISHERS

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1100 Questions and Answers

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## Preface

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India is a vast country where millions of candidates appear in X and XII class examinations, in various competitions and interviews every year. Almost in all the examinations short questions on various science subjects are asked. Students search many books for the preparation of these examinations. There is a great need of a book in short question-answer form dealing with various science subjects to guide the students properly. With this aim in view the present *Science Quiz Book* has been written. The overwhelming response to our earlier editions is what set us about the task of improving and updating the volume as a revised form in your hands.

The revised book contains about 1100 questions and answers on different topics of science. It has been divided into 29 chapters. Nine chapters have been devoted on the topics of modern science such as Computers, Communications, Robotics, Masers and Lasers, Energy, Space Exploration, Nuclear Sciences etc. Five chapters deal with biological science such as Plants Kingdom, Animal World, Human Body, Human Diseases, Medicine and Medical Engineering. One full chapter deals with Chemistry. Apart from these, several chapters have been devoted to Universe, Science Laws, Scientific Instruments, Domestic Appliances, Everyday Science etc. One chapter exclusively deals with the scientific achievements of India so that the reader may get the first-hand knowledge of the scientific achievements of the country. A very important chapter has also been given which presents the recent scientific achievements of the world like NMR Scanner, Acoustic Microscope, Currency Counting Machine and other revolutions. The book has been profusely illustrated. These illustrations give a better understanding of the subject matter. The language used is quite comprehensive so that the reader may not feel any difficulty in understanding the scientific

concepts. No mathematical formulae have been used in the book because they make the subject matter difficult and dry.

We hope the present edition of the book will be more useful for the secondary students and for those who are appearing in various competitive examinations and interviews. It will also be useful for the students of higher classes and general readers.

—**Publishers**

Delhi

October 2004

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# 1. IMPORTANT BRANCHES OF SCIENCE

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**Which branch of Science deals with the study of plants?**

Botany.

**Which branch of Botany deals with the classification and identification of plants?**

Taxonomy.

**Which branch deals with the study of plants?**

Zoology.

**Which branch of zoology deals with the shells of molluscs?**

Conchology.

**What is cryogenics?**

Branch of physics which deals with the production, control and application of very low temperatures.

**Which branch of biology deals with the study of cells?**

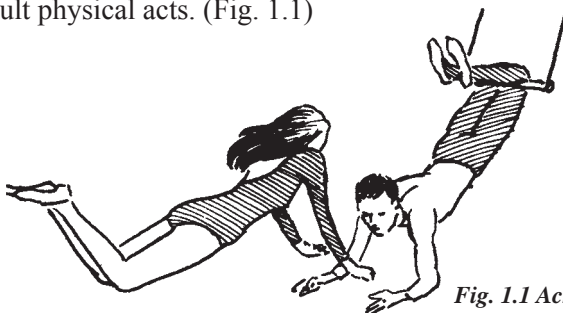
Cytology.

**What is bioengineering?**

It is the application of engineering to biology and medicine.

**Name the art in which acrobatic feats are performed?**

Acrobatics. It refers to the performance of difficult physical acts. (Fig. 1.1)



*Fig. 1.1 Acrobatics*



**What is ecology?**

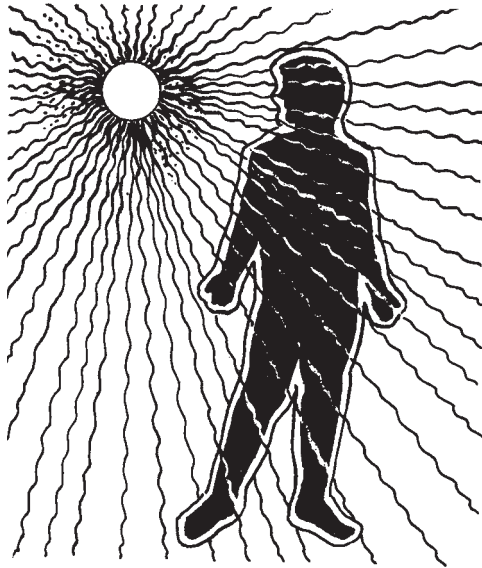
Ecology is a branch of biology. It is the study of the relationship among organisms and environment in which they live, including all living and non-living components.

**What is the science of generation?**

Genesiology.

**What is heliotherapy?**

Treatment of disease by sunlight. (Fig. 1.2)



*Fig. 1.2 Suncure*

**Name the branch of science which deals with the study of teeth.**

Odontology.

**What is phonetics?**

Phonetics is the study of speech sounds and their production, transmission, reception, etc.

**What is orthopaedics?**

Orthopaedics is the science of prevention, diagnosis and treatment of diseases and abnormalities of the musculo-skeletal system. (Fig. 1.3)

**What is pharmacology?**

Pharmacology is the study of properties of drugs and their effects on the human body. It is a branch of medical science.

**Which branch of science deals with the study of tuberculosis of lungs?**

Phthisiology.

**What is phrenology?**

It is the study of the faculties and qualities of mind from the shape of skull.

**What is gynaecology?**

Gynaecology is a specialised branch of medical science. It deals with scientific study and treatment of diseases and disorders of the female reproductive system.

**Which branch of science deals with the study of rocks, their mineral compositions and their origins?**

Petrology.

**What is volcanology?**

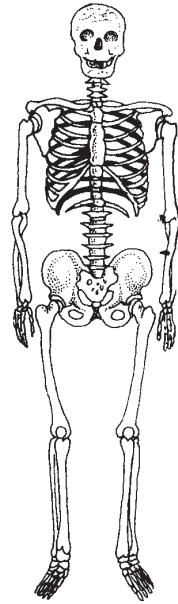
It is the study of volcanoes and the geological phenomena that cause them.

**Name the science which deals with fruits and fruit growings.**

Pomology.

**What is radiology?**

Radiology is the study of X-rays and radioactivity. It is very useful in detecting cancer and other diseases.



*Fig. 1.3 Skeleton*

**Which branch of science deals with nature, origin and movement of moon?**

Selenology.

**What is the study of poisons called?**

Toxicology.

**What is teleology?**

Teleology is the study of evidence in nature.

**What is palaeobotany?**

The study of ancient plants by means of their remains found as fossils in rocks.

**What is materia medica?**

A branch of medical science concerned with the preparation and prescribing of medications and drugs.

**What is meteorology?**

It is the study of the atmosphere.

**What is seismology?**

Seismology is a branch of earth science. It is the study of earthquakes and how their shock waves travel through the earth.

**What is the science of law called?**

Jurisprudence.

**What is the science of dendrology?**

Science related to the study of trees and shrubs.

**What is Karyology?**

It is related to the study of nucleus.



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## 2. COMPUTERS

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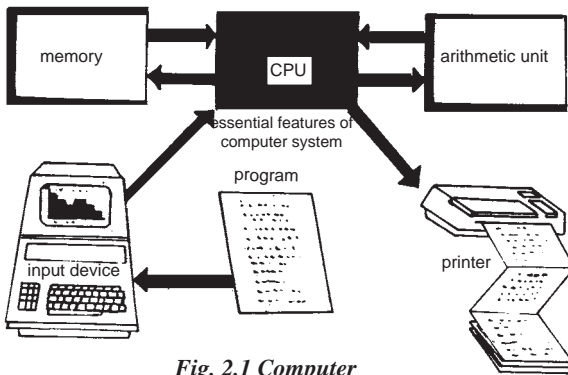
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### What is a computer?

A computer is a programmable electronic machine used for performing calculations and other symbol manipulation tasks, quickly and accurately. They are being widely used in science, engineering, medicine, space, games, communications etc.

### What are the essential parts of a computer?

Basic components of a computer is the CPU (Central Processing Unit), which performs all the computations. This is supported by memory which holds data and the current program and “logic arrays” which move information around the system. (Fig. 2.1)



*Fig. 2.1 Computer*

### How many types of computers are there?

There are mainly three types of computers: the analog computer which measures one quantity in terms of another, the digital computer which solves problems by using numbers, and the hybrid computer which has components of both analogue and digital computers.

### When was the first digital computer developed and by whom?

In 1944, Professor Howard H. Aiken of the Harvard University and International Business Machines (IBM) developed a digital

computer. The first true electronic computer was ENIAC (Electronic Numeric Integrator and Calculator), built in 1946 by engineers at the University of Pennsylvania. In 1949, John Von Neumann's computer EDVAC (Electronic Discrete Variable Computer) was the first to use binary arithmetic and to store its operating instructions internally. It still forms the basis for today's computers.

### **Which arithmetic is used by a computer?**

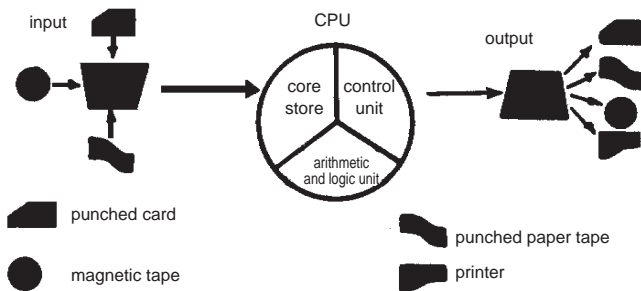
A computer uses binary code in which numbers and alphabets are converted in the digits of one and zero.

### **What is the function of memory unit?**

In the memory unit the data of the given problem and the programme to solve it are kept separately. Internal memory unit has metal oxide semiconductor field effect transistor and the external memory unit has a magnetic tape, the magnetic drum and a magnetic disc.

### **How does a digital computer work?**

A digital computer is fed with all the information with a programme of instructions on what to do with it. Programmed data is channelled into the central processing unit by an input machine. Programmed data goes into the storage unit or core store. Calculations are then performed by the arithmetic and logic unit. All storage and calculation operations are controlled by the control unit. Answers are given by an output machine. (Fig. 2.2).



*Fig. 2.2 Computer functions*

## **How are computer generations classified?**

These are classified under five broad groups:

- (a) First generation developed in the 1940s and 1950s, made from valves and wire circuits.
- (b) Second generation from early 1960s based on transistors and printed circuits.
- (c) Third generation from the late 1960s using integrated circuits.
- (d) Fourth generation using micro processors and sophisticated programme languages still in use in the 1990s.
- (e) Fifth generation, based on parallel processing very large scale integration.

## **What is meant by the computer programming languages?**

Computers are designed to understand certain languages. Some of the important languages are: BASIC (Beginner's All-purpose Symbolic Instructions Code), COBOL (Common Business Oriented Language), FORTRAN (Formula Translation), LISP (List Processing), PASCAL (French acronym), widely used for teaching programming in colleges/universities, PROLOG (Programming in Logic), etc.

## **What do you mean by the of terms 'hardware' and 'software'?**

All the devices, circuitry and whatever we can touch and feel in a computer system is known as hardware. Software, in general, refers to the groups of instructions given to the computer to make it perform certain operations.

## **What are the important applications of computers?**

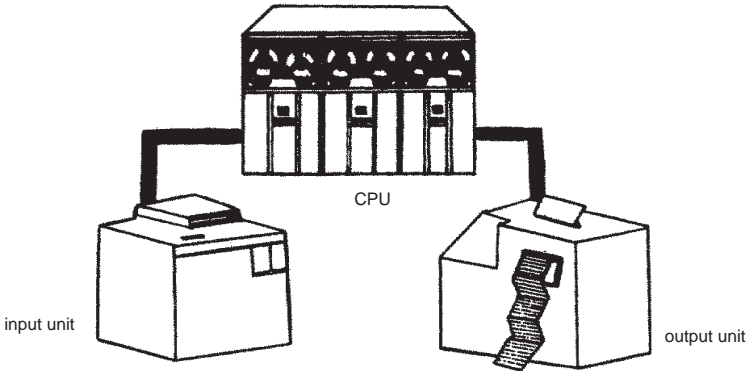
Computers are being applied in science, engineering and industry, medicine, business management, telecommunications, education, transportation, banks, space research, etc. One can play games like chess and poker.

## **What are computer graphics?**

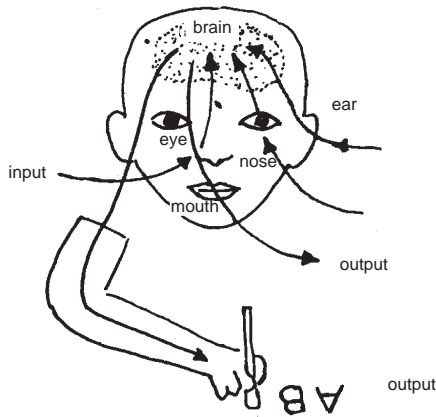
Use of computers to display and manipulate information in pictorial form by scanning an image or by drawing with a mouse on graphics tablet.

## How does a computer function like a man?

The input unit of a computer is equivalent to our eyes and ears. The central processing unit is equivalent to the brain. The output unit is equivalent to our hands and mouth. (Fig. 2.3 and 2.4)



*Fig. 2.3 Comparison of a computer and man*



*Fig. 2.4 Man*



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## 3. ELECTRONICS

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### What is electronics?

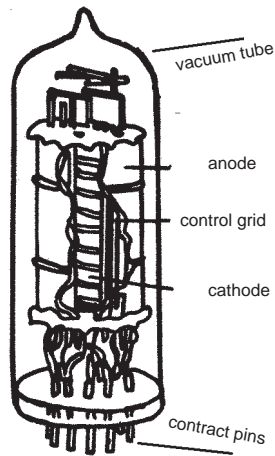
The branch of physics dealing with the production and control of electrons in devices such as semiconductors, vacuum tubes and various instruments.

### What is a thermionic valve?

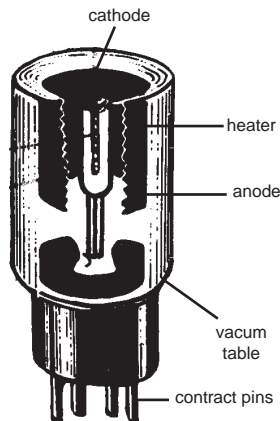
Electron tubes in which electrons are emitted from a heated cathode. The British physicist John Ambrose Fleming developed the first valve in 1904 for use in radio receivers. It was a diode valve containing a cathode and anode enclosed in an evacuated glass bulb. Two years later the American physicist Lee de Forest produced a triode valve which has a third electrode called grid put between anode and cathode. (Fig. 3.1)

### How does a diode work and what is its use?

When the cathode is heated, electrons are emitted. These are attracted towards the positively charged anode by which the current flows through the valve but only in one direction towards the positive anode. If the anode becomes negatively charged, no current would flow. Diode valve is used for converting AC into DC in rectifiers. (Fig. 3.2)



*Fig. 3.1 Thermionic valve*



*Fig. 3.2 Diode valve*



### How does a microwave oven work?

Microwave ovens cook food by means of radiation. This radiation is generated by a tube called magnetron.

### What is a semiconductor?

A material whose electrical conductivity lies between those of a conductor and insulator is known as a semiconductor. The group of elements known as metalloids are semi-conductors such as silicon, germanium, tellurium and selenium.

### What is a p-n junction semiconductor?

A p-n junction semiconductor is just like a diode valve but it is made of silicon or germanium. When an element like phosphorus is doped as impurity in silicon it becomes a n-type semiconductor. When another impurity like boron or aluminium is doped in silicon it becomes a p-type semiconductor. By putting a n-type and p-type semiconductor together, it becomes a p-n junction semiconductor. In such a semiconductor, current flows only in one direction due to the recombination of electrons and holes. A hole is where an electron is missing. It has positive charge. (Fig. 3.3)

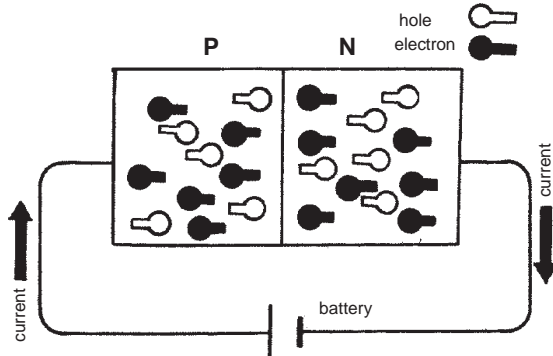


Fig. 3.3 Operation of the p-n junction semiconductor

### What is a thyristor?

It is a type of rectifier of an electronic device that conducts electricity in one direction. Thyristor is composed of layers of semiconductor material sandwiched between two electrodes called anode and cathode.

### How does a 'n-p-n' transistor work?

A transistor is just equivalent to a triode valve. In a 'n-p-n' transistor, the voltage of the base must be more positive than the voltage of the emitter. The voltage of the collector must be more positive than the voltage of the base. In this way, the negatively charged electrons move from the emitter, through the base to the collector. The flow of electrons produces a current. The number of electrons in the base controls the flow of electrons from the emitter to the collector.

### How does an electric razor work?

An electric mechanism sets in motion one or more razor blades. Above the blade there is a razor metal head. The facial hair penetrates this head and is cut by the moving blade.

### What is an amplifier?

An amplifier is an electronic device that increases the strength or power of an electrical signal. It consists of vacuum tubes or transistors connected together in a circuit. Amplifiers are used to produce high quality sound.

### How does a 'p-n-p' transistor work?

In a 'p-n-p' transistor, it is the positively charged holes that move from the emitter to collector. In this, the voltage of base is more negative than the voltage of emitter and also collector is more negative than the base. (Fig. 3.4)

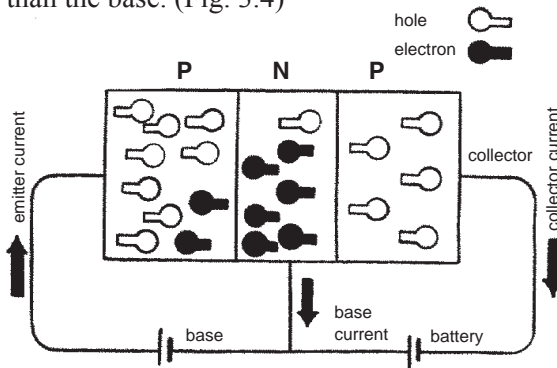


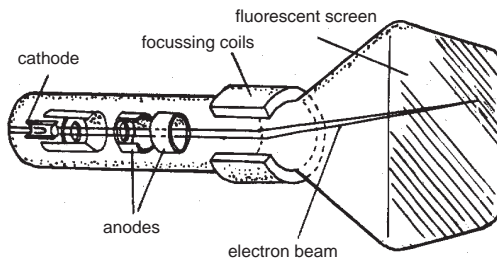
Fig. 3.4 Operation of the transistor

### What is an oscillator?

An oscillator is an electronic device which produces electrical signals of desired frequency. In fact, it is a feedback amplifier that strengthens a signal and then feeds part of the amplified signal back into itself to make its own output. They are used in radio and television receivers and in other equipments.

### What is an oscilloscope?

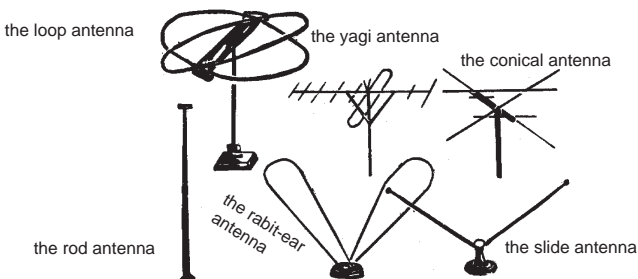
An oscilloscope is an electronic instrument which contains a cathode ray tube similar to the tube found in television sets. It contains a screen, an electron gun, anodes, focussing coils, etc. Readings are displayed graphically on the screen of a cathode ray tube. (Fig. 3.5)



*Fig. 3.5 Cathode ray tube*

### What is an antenna?

An antenna is a piece of equipment used for sending and receiving electrical messages. It is a basic part of all electronic communication systems. It is used for radio, television, radar and radio telescope operations. Different types of antenna are shown in fig. 3.6.



*Fig. 3.6 Different types of receiving antennas*

### **What is a microphone?**

A microphone is a device which converts sound waves into electric current. The essential parts of a microphone are a diaphragm and a device which converts the vibrations of a diaphragm into variable electric current. The device may be a moving coil, a piezoelectric crystal, a capacitor or carbon granules.

### **What is an integrated circuit?**

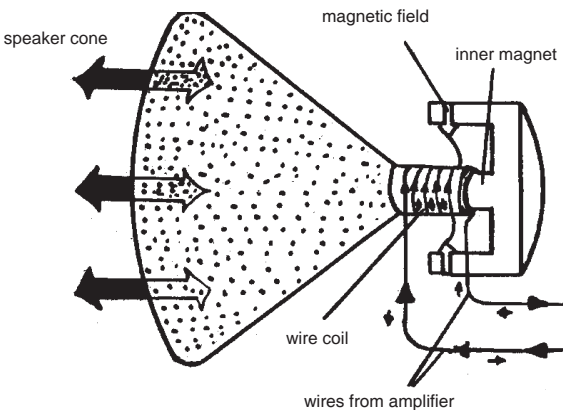
An ordinary circuit consists of various components connected together with wires. An integrated circuit has all its components on one small 'chip' of silicon and different impurities are added to different parts of a silicon chip. This makes the different parts behave like resistors, diodes or triodes.

### **What is a teleprinter?**

It is a telegraph transmitter with the help of which we can send messages at the rate of more than 50 words per minute. Signals are sent by pressing the keys of a machine which resembles a typewriter.

### **How does a loudspeaker work?**

A loudspeaker is a device that converts electrical signals into sound waves. A common loudspeaker is a moving coil speaker as shown in fig. 3.7. A coil of wire is attached to the apex of large paper cone



*Fig. 3.7 Loudspeaker*

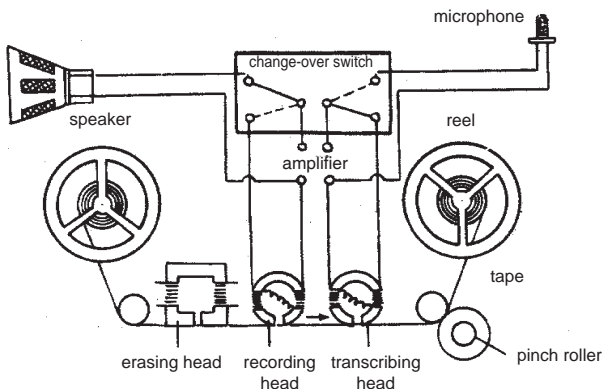
and placed between the poles of a permanent magnet. When an electrical current passes through the coil, it sets up a magnetic field. This produces vibrations in the cone by which sound is emitted.

### **What is a tape-recorder?**

A tape-recorder is a machine that can record and playback sound. It makes use of a magnetic tape for recording and reproducing sound.

### **How does a tape-recorder work?**

A tape-recorder is an electronic machine that can record sound on a tape coated with iron oxide. In this device first the sound is converted into electric current by a microphone. The current is amplified by an amplifier. The current is then recorded on a magnetic tape in the form of magnetic field. The tape is run by an electric motor. To reproduce the sound, the magnetic field again changes it into sound. (Fig. 3.8)



*Fig. 3.8 Mechanism of the tape-recorder*

### **What is a rectifier?**

It is an electronic device that allows electricity to pass in one direction only. It converts A.C. into D.C.

