



Government of Tamilnadu

Department of Employment and Training

Course : TNPSC Group II Exam

Subject : Physics

Topic : **Glossary**

© Copyright

The Department of Employment and Training has prepared the TNPSC Group-II Preliminary and Main Exam study material in the form of e-content for the benefit of Competitive Exam aspirants and it is being uploaded in this Virtual Learning Portal. This e-content study material is the sole property of the Department of Employment and Training. No one (either an individual or an institution) is allowed to make copy or reproduce the matter in any form. The trespassers will be prosecuted under the Indian Copyright Act.

It is a cost-free service provided to the job seekers who are preparing for the Competitive Exams.

**Commissioner,
Department of Employment and Training.**

GLOSSARY

- ❖ **Absolute Zero:** The lowest imaginable temperature, at which all the particles in a body would be completely at rest. It is 273°C (-459°F).
- ❖ **Acoustics:** The science that studies sound and hearing.
- ❖ **Alpha Particle:** One of the three types of radiations emitted by some radioactive substances, consisting of two protons and two neutrons.
- ❖ **Ampere:** The unit used to measure the size of an electric current. It is named after the French scientist Andre Ampere (1775-1836).
- ❖ **Amplifier:** An electronic device that increases (amplifies) the strength of electric currents. Radio and TV sets and record players all use amplifier.
- ❖ **Amplitude:** The maximum value (or maximum height of the waves) of anything that goes back and forth in a cycle, for example alternating current or sound waves.
- ❖ **Anode:** The positive terminal through which electric current goes into a liquid (called the electrolyte) during electrolysis.
- ❖ **Asteroid:** Another name for a minor planet-one of the thousands of small bodies circling around the Sun, measuring from a few metres to a thousand kilometres.
- ❖ **Atmosphere :** The envelope of gases that surrounds the Earth (or any other planet, star or moon).
- ❖ **Aurora :** A display of coloured light high in the Earth's atmosphere. It is caused when particles from the Sun make the gas in the atmosphere glow. This usually happens near the Earth's poles. There are two kinds of aurora.
 1. Aurora Borealis visible in the northern hemisphere.
 2. Aurora Austral is visible in the southern hemisphere.
- ❖ **Barometer :** An instrument used for measuring atmospheric or air pressure. In the Mercury

-◆
- Barometer, the height of a column of mercury indicates the pressure. In an Aneroid Barometer, the pressure is measured by the amount it squashes the sides of a metal box containing a vacuum.
- ❖ **Beta Particles:** Fast-moving electrons emitted by some radioactive substances, more penetrating than alpha particles, but less penetrating than gamma rays.
 - ❖ **Big Bang:** The theory most astronomers use to explain how the universe began. Everything that exists now was crushed into a super hot ball that exploded about 4.7 billion years ago.
 - ❖ **Binary Star:** A pair of stars turning around each other. They may take a few hours if they are very close, or thousands of years if they are far apart.
 - ❖ **Black Hole :** An object with such strong gravity that light waves cannot escape from it. Anything pulled inside a black hole is lost forever.
 - ❖ **Cathode :** The negative terminal through which electric current goes into a liquid (called the electrolyte) during electrolysis.
 - ❖ **Cathode Ray Tube:** An electronic device basically consisting of a glass tube containing a vacuum and two metal electrodes-a negative cathode and a positive anode. When the electrodes are connected to a high voltage source of electricity, electrons stream from the cathode to the anode. Using suitable deflecting devices, the electrons can be aimed at a fluorescent screen on the wall of the glass tube. This glows when struck by electrons.
 - ❖ **Centrifugal Force:** An outward force that acts on an object turning in a circle around a central point.
 - ❖ **Centripetal Force:** The inward force that keeps a body, such as a satellite, moving in a circular path.
 - ❖ **Chronometer:** A device for measuring time, such as a clock or a watch.
 - ❖ **Comet:** A mixture of crumbly rock and ice, a few kilometres across, which travels around the Sun. If it comes near the Sun the heat makes dust and gas pour off in a long glowing 'tail':

- ❖ **Computer:** An electronic device for storing and manipulating large amounts of information. Their great advantage is the speed with which they do calculations and retrieve information.
- ❖ **Concave:** Curved inwards. A concave lens is thicker at the edges than in the middle.
- ❖ **Conduction:** The process of passing heat from molecule to molecule that allows heat to be transferred from one part of a substance to another.
- ❖ **Conductor:** A substance, such as copper, that will allow electricity to flow along it.
- ❖ **Constellation:** A group of stars making a pattern in the sky. Some constellations were named thousands of years ago. There are 88 covering the whole sky.
- ❖ **Convection:** The movement of heat from place to place in a flowing liquid or gas.
- ❖ **Convex:** Curved outwards. A convex lens is thinner at the edges than in the middle.
- ❖ **Corona:** The outer part of the Sun's atmosphere that is visible as a pearly halo during a total eclipse of the Sun.
- ❖ **Current Electricity:** The movement of electrons along a conductor that produces a flow of electricity.
- ❖ **Decibel:** A unit used for measuring the loudness of sounds. A soft whisper is about 0 decibels. A jet taking off is about 120 decibels.
- ❖ **Diffraction of Light :** The way a thin beam of light spreads out around the edge of a shadow. This causes thin bands of light and dark along the edges of the shadow.
- ❖ **Diode:** An electronic tube containing two electrodes, one an anode, the other a cathode and allowing current to go in one direction only.
- ❖ **Direct Current:** An electric current that flows in one direction only. The current from a battery is a direct current (DC).
- ❖ **Doppler effect:** The effect takes place in light and sound.. Doppler effect in light takes place when stars recedes or move towards the surface of earth. Doppler effect in sound takes place when there is a

- ♦.....♦
- relative motion between the source and the observer or both.
- ❖ **Elasticity:** The ability of a material to return to its original shape after it has been stretched out of shape.
- ❖ **Electricity:** Energy associated with a flow of electrons or other charged particles.
- ❖ **Electrode :** An electrical conductor through which an electric current leaves or enters an electron tube or similar device. Anodes and cathodes are electrodes.
- ❖ **Electromagnet:** A device consisting of many coils of wire through which electric current can flow. When the current is turned on there is a magnetic field. It vanishes when the current is turned off.
- ❖ **Electromagnetic wave:** When a charged particle is accelerated, it produces a magnetic field in the near space, the magnetic field acts as a virtual source for the further production of electric field. Hence both of them acts as source for each other. This phenomenon gives rise to electromagnetic waves.
- ❖ **Electron :** Sub-atomic particle with a negative electric charge.
- ❖ **Electronics:** The study of devices such as diodes or valves where electrons pass through a semiconductor, gas or vacuum as in computers, radios or televisions.
- ❖ **Electron Microscope:** A microscope that magnifies with the help of streams of electrons instead of light rays.
- ❖ **Electron Tube:** A tube controlling a flow of electrons, for instance a diode, triode or a television tube.
- ❖ **Evaporation:** The gradual turning of a liquid into a vapour (gas). When wet clothes dry out, the water in them evaporates. Fahrenheit Temperature Scales. A scale used to measure temperatures in which the freezing point of water is 32° and the boiling point of water is 212°. The scale is named after the German Scientist Gabriel Daniel Fahrenheit (1686 - 1736).
- ❖ **Fluorescence:** The glow caused when light is absorbed at one wavelength and sent out at another. In a neon-tube, ultraviolet is turned into visible light by fluorescent substances in the tube.
- ❖ **Force:** A push or pull that makes an object move, or change shape or

- direction. Examples are gravity and magnetism.
- ❖ **Frequency:** The number of waves or cycles that occur in one second. A frequency of one Hertz is one cycle per second. Frequency of sound waves determines their pitch, frequency of light waves determines their colour.
 - ❖ **Free Fall:** An object that is moving under the influence of gravity alone is said to be in 'free fall' A spacecraft is in free fall when its rocket engine is not firing. Everything in it is then weightless, because everything is moving together - sensations of weight occur only when the pull of gravity is resisted by for example, the ground.
 - ❖ **Friction:** The force that holds back two surfaces that are sliding across one another. Bicycle brakes for example use friction to stop motion.
 - ❖ **Fulcrum:** The point about which a lever turns or pivots.
 - ❖ **Galaxy:** The name given to our own Milky Way or to a very remote, independent system of stars.
 - ❖ **Galvanometer:** An instrument which detects and measures very small electric currents.
 - ❖ **Gamma Rays:** A powerful type of electromagnetic radiation given out when certain atoms disintegrate.
 - ❖ **Geiger Counter:** An instrument which detects and measures radio-activity. It is named after Hans Geiger {1882-1945}, the German Scientist who invented it.
 - ❖ **Generator:** A machine that converts mechanical energy into electrical energy. A dynamo produces direct current (D.C) electricity. An alternator produces alternating current (A.C.) electricity.
 - ❖ **Geo-stationary Orbit:** A satellite orbit that follows the line of the equator 35,900 km (22,307 miles) above the Earth's surface in the same direction in which the Earth spins. At this height the satellite moves at the same rate as the Earth spins and therefore always remains above the same point on the equator.
 - ❖ **Gravity/Gravitation:** Every particle of matter attracts every other particle. This force is called gravity. The gravitational attraction of small objects is not noticeable, but the gravitational

-◆
- ◆ attraction of a mountain can be measured. And gravitational force is responsible for preventing the oceans, atmosphere and everything else on Earth from escaping into Space.
 - ❖ **Greenhouse Effect:** The result of solar energy being trapped in the Earth's atmosphere causing too much carbon-dioxide and raising average world temperatures.
 - ❖ **Half-life:** The time it takes for the radio-active substance to decrease to half its original value.
 - ❖ **Heat:** A form of energy due to the movement of the atoms and molecules in a body. The amount of heat in a body is usually measured in joules, although heat units like the calorie or the British thermal unit are sometimes used.
 - ❖ **Hertz:** The unit used to measure frequency, equal to one cycle per second.
 - ❖ **Hologram:** A three-dimensional picture made using laser light.
 - ❖ **Hovercraft:** A propeller-driven vehicle which moves on a cushion of air. Hovercraft can also travel over land or sea.
 - ❖ **Hydraulics:** The science of using liquids, such as water or oil, to operate mechanical devices. The word 'hydraulic' is applied to such devices. A car's main brakes, for example, are hydraulic. They are operated by the pressure of the driver's foot on a pedal, transmitted through oil contained in pipes.
 - ❖ **Inertia:** Also known as Newton's 1st law of motion i.e. a body remain in a state of rest or in a state of motion unless an external force is applied.
- Information**
- ❖ **Technology:** The methods of sending, obtaining, and storing information by electronic means. It involves the use of computers, data bases, and modems for connecting computers together.
 - ❖ **Infra-red Radiation:** Heat radiation-a type of invisible light with wavelength longer than the wavelength of visible light. The infra-red radiation in sunlight can be felt as warmth on the skin.
 - ❖ **Insulator:** Either a substance that will not allow heat to pass through it, or one that will not allow electricity to pass through it.

- ❖ **Interstellar:** All space outside the solar system among the stars.
- Integrated Circuit:** A tiny mass of electronic components in or on a small slice of semiconductor substance.
- ❖ **Joule:** A unit used to measure the amount of energy or work done. One joule is the work done when a weight of one Newton is lifted one meter. It is named after James Joule (1818-89), a British physicist.
- ❖ **Kelvin Temperature Scale:** A scale used to measure temperatures in which absolute zero is 0° and the freezing point of water is 273.15° . It is named after the British scientist Lord Kelvin (1824-1907).
- ❖ **Kinetic Energy:** The energy an object has because it is motion.
- ❖ **Laser :** A device that produces a narrow powerful beam of light. A laser is a light amplifier that increases an initial weak pulse of light into an intense narrow beam. Lasers are used in medicine and industry.
- ❖ **LCD Display:** The kind of display used on most calculators and digital watches. It uses a thin layer of a 'liquid crystal', which is a little like a crystal and a little like a liquid. When an electric voltage is applied at any place on the liquid crystal that part of it becomes dark. That is how the constantly changing letters and numbers are made. 'LCD' stands for 'liquid crystal diode'.
- ❖ **Lever:** A simple machine used for lifting heavy weights. It consists of a strong bar that turns about a pivot, like a seesaw.
- ❖ **Lightning:** The result of water and air molecules in clouds rubbing together, making an electrical charge.
- ❖ **Light Year:** The distance that light travels in one year (=9,500,000,000,000 km or 6,000,000,000,000 miles).
- ❖ **Load:** The weight lifted or moved by a machine.
- ❖ **Magnet:** An object which attracts iron and attracts or repels other magnets. The magnetic force is strongest at two points called the north and south poles. When free to move, a magnet turns so that the north pole points north and the south pole points south, as in a compass.

- ❖ **Magnetic Field:** The space around a magnet or an electric current where its magnetic effect can be felt.
- ❖ **Mass:** The amount of matter in an object. Mass is different from weight because weight depends on gravity but mass is always the same.
- ❖ **Modem:** A device used to connect a computer to a telephone line so that computer information can be sent along the line. The modem changes the computer signals, which are called digital signals, into sounds that can be transmitted by telephone lines.
- ❖ **Momentum:** The impetus of a moving object. It is equal to the mass of the object multiplied by its speed.
- ❖ **Neutron:** One of the two types of particles that make up the atomic nucleus. It is so called because it is electrically neutral-it has no electric charge. Outside the nucleus a neutron survives 13 minutes on average then it breaks up into an electron and proton.
- ❖ **Nuclear Fission:** Fission is another word for splitting. In nuclear fission, the nucleus of an atom splits in two, releasing energy.
- ❖ **Nuclear Fusion:** The joining, or fusing, of the nuclei of two light atoms to make a heavier nucleus. This process releases large amount of energy. The sun produces its energy by fusing hydrogen nuclei to make helium.
- ❖ **Nuclear Reactor:** A power station producing electricity from energy released by splitting the nuclei of atoms.
- ❖ **Nucleus:** The central core of the atom. The simplest nucleus is that of the hydrogen atom. It consists of a single proton. All other nuclei consist of neutrons and protons. Electrons revolve around the nucleus. They are very light, and most of the atom's weight is in the nucleus.
- ❖ **Nylon:** An artificial plastic and fibre. The raw materials come from oil or coal. Many different types of nylon are made, including nylon thread.
- ❖ **Ohm:** A unit used to measure electrical resistance. It is named after G.S. Ohm (1787 -1854). a German Physicist.
- ❖ **Orbit:** The invisible path which a planet follows around the sun, or a

- satellite follows around a planet. Orbits are never perfect circles, but ellipses.
- ❖ **Ozone Layer:** A layer of the earth's atmosphere containing ozone, which protects the earth from too much ultra-violet radiation.
 - ❖ **Parallel Circuit:** An electrical circuit in which the components are connected side-by-side. The current flowing in the circuit is shared by the components.
 - ❖ **Particle Accelerator:** A large machine used by scientists to study the small particles that make up atoms. It speeds up, or accelerates, particles such as protons or electrons and shoots them at a target.
 - ❖ **Penumbra:** The lighter edge of a shadow, where the bright object (such as the Sun) is not completely hidden. It is also the name for the lighter edge of a sunspot.
 - ❖ **Phosphorescence:** A cold glow given out by some substances. For example, fireflies and glow-worms phosphors.
 - ❖ **Photon:** A packet of light energy. In some situation, a beam of light behaves as if it was a stream of small particles which scientists call photons.
 - ❖ **Photoelectric Effect:** The generation of an electric current in certain materials when light falls on them. Light meters in cameras use the photoelectric effect to measure the brightness of light.
 - ❖ **Physical Change:** A change, such as melting or boiling, that does not produce a new chemical substance.
 - ❖ **Physics:** The science that studies matter, the forces of nature and the different forms of energy, such as heat, light and motion.
 - ❖ **Piezoelectric Effect:** The generation of an electric current in certain crystals when they are squeezed or stretched. When a voltage is applied to the same crystal it contracts (grows smaller) or expands (grows bigger) slightly. Piezoelectric crystals are used in watch and calculator beepers.
 - ❖ **Plastics:** Artificial material in which the molecules are joined together in a long chain (or polymer). They can be shaped by pressure and heat. Many types of plastic are made, with different

-◆
- properties for different purposes.
- ❖ **Potential Energy:** The store of energy an object has because of its position. It can be converted to kinetic energy if the object begins to move.
 - ❖ **Pressure:** The force or weight acting on a unit area of surface. Atmospheric pressure is the pressure of the air on a unit area of the earth's surface.
 - ❖ **Primary Colours:** One of the three colours (red, green and blue) of light that, when mixed, can give light of any colour; or one of the three colours of pigment or paint (red, blue and yellow) that can be mixed to give paint of any colour, except white.
 - ❖ **Pulsar:** A fast-spinning neutron star sending out a beam of light waves and radio waves. This beam 'pulses'; like the circling beam of a lighthouse.
 - ❖ **Quasars:** Giant galaxies with centres hundreds of times brighter than ordinary galaxies. They are all thousands of millions of light-years away.
 - ❖ **Radar:** (Radio detection and ranging). A system that uses radio waves to detect the position of objects. The radio waves are sent out by a transmitter/receiver via a rotating aerial. The waves that are reflected by objects return to the aerial. In the receiver the distance and direction of each object is calculated using the time difference between sending and receiving the signal and the position of the aerial. An electrical signal containing this information is sent to a device that works rather like a television and the objects appear as luminous 'blips' on a screen.
 - ❖ **Radiation (heat) :** The transfer of heat in the form of electromagnetic waves.
 - ❖ **Radioactivity:** A radioactive element has unstable nuclei which split up and emit alpha, beta and gamma rays. When the nucleus of an atom splits up, it produces radiation in the form of rays or particles. Radiation in large doses is Lethal.
 - ❖ **Radiocarbon dating:** Discussed by Sir Willard Libby. Also called carbon dating: a way of telling how

- old dead matter is. All living things give off small amounts of radiation, this amount decreases after the thing dies and so can be measured to find how long ago it lived.
- ❖ **Reflection:** The bouncing back of a sound or light wave as it hits a surface.
 - ❖ **Refraction:** The bending of a ray of light as it passes from one substance to another, for example, from glass to air.
 - ❖ **Resistance:** The way in which an electrical circuit opposes the flow of electric current through it. Resistance is measured in ohms and is equal to the voltage divided by the current.
 - ❖ **Resonance:** The way in which a small vibration can cause a large effect. For example, a singer can make a glass vibrate slightly by singing loudly, if the right note is sung, the glass vibrates violently because of resonance, and may break.
 - ❖ **Robot:** Based on principle of artificial intelligence. A machine which can do a job that is usually done by a human being. Robots are used on factory assembly-lines
 - to do one particular job that is continually repeated.
 - ❖ **Satellite:** A body that revolves around a larger one because of its gravitational attraction. The Moon is a satellite of the earth, and the planets are satellites of the Sun.
 - ❖ **Semiconductor:** Material that conducts electricity not as well as conductors such as copper, but better than insulators such as glass.
 - ❖ **Series Circuit:** An electric circuit in which the components are connected end-to-end, so that the current flows through all the components one after the other.
 - ❖ **Solar System:** The family of planets, moons and comets revolving around our sun. There are probably countless other solar systems around stars in our Galaxy and elsewhere in the Universe.
 - ❖ **Solid:** A physical state of matter, in which a substance has a definite mass, volume and shape.
 - ❖ **Solution:** A liquid that contains a solid (or gaseous) substance completely dissolved in it.
 - ❖ **Spectroscope:** An instrument attached to a telescope used by

-◆
- astronomers to produce a spectrum of a celestial body.
- ❖ **Spectrum:** The rainbow-coloured band of light produced when white light is passed through a prism. The colours are arranged in order of the wavelength of their waves; red is the longest and violet is the shortest.
 - ❖ **Static Electricity:** Non-moving electric charge on an object, often produced by friction, for example shoes rubbing on a carpet.
 - ❖ **Superconductor:** A substance which loses its electrical resistance at very low temperatures. Superconductors are usually metals. Researchers have recently discovered ceramic superconductors that do not require such extreme low temperatures.
 - ❖ **Surface Tension:** The way the surface of a liquid such as water seems to be covered by a thin elastic film. This causes small droplets to become ball-shaped. Some insects can walk on water because the surface tension holds them up.
 - ❖ **Thermodynamics:** The branch of science concerned with heat and mechanical energy, and how one can be converted into the other.
 - ❖ **Transformer:** A device used to change the voltage of an alternating electric current. Transformers are used in electric power stations to increase the voltage of the electricity produced so that it can be sent along high-voltage cables.
 - ❖ **Transistor:** An electronic device, with no moving parts, that can be used as a switch or to amplify an electric signal.
 - ❖ **Triode:** An electron tube containing a cathode, an anode and grid to control the current between them.
 - ❖ **Ultrasound:** Sound waves of very high frequency which are beyond human hearing.
 - ❖ **Ultraviolet Radiation:** A type of invisible light with wavelength shorter than the wavelength of visible light. Ultraviolet light in sunshine causes suntan.
 - ❖ **Universe:** The whole of space and everything in it.
 - ❖ **Vacuum:** A space in which there are no atoms or molecules. (Perfect vacuums are impossible to make so it usually means a place where the pressure is much lower than that of normal air).

- ❖ **Volt:** It is the unit of measuring electric potential difference.
- ❖ **Voltaic Cell:** A type of electric cell invented by Alessandro Volta in 1800. It consists of two terminals of different metals dipping into salt water.
- ❖ **Wavelength:** The distance between the peak of one wave and the peak of the next.
- ❖ **Waves:** Regular disturbances that spread out from their source. Sound waves are disturbances of the molecules of the air caused by a vibrating body. Electromagnetic waves are disturbances of the magnetic and electric fields in space.
- ❖ **Weight :** It is the force exerted by gravity.
- ❖ **Work:** The amount of energy used when a force moves an object. The amount of work done is calculated by multiplying the force by the distance the object moves.
- ❖ **X-rays:** Very short electromagnetic waves which can cause a chemical change on photographic plates and are used in radiography by doctors.