فيزياء/اول سليمان

Opposites

قادر	Able	X	Unable
يقبل	Accept	X	Refuse
يسمح	Allow	X	Forbid
قاعدة	Base	X	Top
كامل	Complete	X	Incomplete
فضولي	Curious	X	Indifferent
عميق	Deep	X	Shallow
مدخل	Entrance	X	Exit
رائع	Fine	X	Poor
رشيق	Graceful	X	Awkward
ثقيل	Heavy	X	Light
خفي	Hide	X	Show
قانوني	Legal	X	Illegal

Words ----------Verbs

مطابقة Identity --Identify

قوة Force --Enforce

طول Length --Lengthen

أسير Captive --Capture

هبوط Descent --Descend

انكار Denial --Deny

توصيل Conduction --Conduct

انفجار Explosion ---Explode

طيران Flight --Fly

فقدان Loss---Lose

اشتغال Occupation--Occupy

زواج Marriage ---Marry

متابعة Pursuit --Pursue

راحة Relief ---Relieve

Words ------------ Nouns

شجاع Brave --Bravery

معقد Complex --Complexity

مرتفع High--Height

طويل Long --Length

مرئي Visible --visibility

محوري Axial --Axis

سهل Easy --Ease

ضخم Giant ---Gigantic

قانوني Lawful --Law

ضروري Necessary ---Necessity

قطبي Polar --Pole

يقرر شيء Decide ---Decision

ينفجر Explode --Explosion

يحزن Grieve ---Grief

يتوسع Expand ---Expansion

يستلم Receive ---Recipient

Irregular verbs

Infinitive	Simple Past	Past Participles
يتمدد أو يكذب Lie	Lay	Lain
يشرق Light	Lit	Lit
ينهض Rise	Rose	Risen
يطير Fly	Flew	Flown
ينمو Grow	Grew	Grown
يختار Choose	Chose	Chosen
يقود Lead	Led	Led
يهتز Shake	Shook	Shaken
يرى See	Saw	Seen
يركض Run	Ran	Run
يرن Ring	Rang	Rung
يرسم Draw	Drew	Drawn
يسقط Fall	Fell	Fallen
يأكل Eat	Ate	Eaten
يسبح Swim	Swam	Swum

The development of other sciences depends in many respects on the knowledge of physical phenomena.

Physics studies various phenomena in nature: mechanical motion, heat, sound, electricity, magnetism and light. Physics divides itself very naturally into two great branches, experimental physics and theoretical physics. The former is the science of making observations and devising experiments which give us accurate knowledge of the actual behavior of natural phenomena. On the basis of experimental facts theoretical physics formulates laws and predicts the behavior of natural phenomena. Every physical law is based on experiments and is devised to correlate and to describe accurately these experiments. The wider the range of experience covered by such a law, the more important it is. Physics is divided into half a dozen or more different fields — mechanics, sound, heat, electricity and magnetism, light, molecular, atomic and nuclear physics. These different fields are not distinct but merge into each other.

In all cases physics deals with phenomena that can be accurately described in terms of matter and energy. Hence, the basic concepts in all physical phenomena are the concepts of matter and energy. And it is important to determine accurately the characteristics of both matter and energy, the laws that govern their transformations, and the fundamental relations that exist between them.

Matter. Every substance can be divided into particles known as molecules. Chemical reactions indicate that the molecules are composed of smaller units, or atoms. Modern physical methods of investigation have shown that the atom consists of a centrally situated nucleus with a total positive charge surrounded by a number of electrons which revolve about the nucleus. In a stable atom, the total positive charge of the nucleus is equal to the total negative charge of the electrons which surround the nucleus. The total electrical charge is zero and this is the conventional state of most atoms.

Matter can exist in four states: solid, gas, liquid and plasma.

III. Define the part of speech of the following words and translate them into Russian.

a) physics – physicist – physical
nature – naturalist – natural
experiment – experimentalist – experimental
theory – theorist – theoretical
chemistry – chemist – chemical
observation – observer – observational
transformation – transformer – transformable
indication – indicator – indicative

Mechanics, science concerned with the motion of bodies under the action of forces, including the special case in which a body remains at rest. Of first concern in the problem of motion are the forces that bodies exert on one another. This leads to the study of such topics as gravitation, electricity, and magnetism, according to the nature of the forces involved. Given the forces, one can seek the manner in which bodies move under the action of forces; this is the subject matter of mechanics proper.

Historically, mechanics was among the first of the exact sciences to be developed. Its internal beauty as a mathematical discipline and its early remarkable success in accounting in quantitative detail for the motions of the Moon, the Earth, and other planetary bodies had enormous influence on philosophical thought and provided impetus for the systematic development of science into the 20th century.

Mechanics may be divided into three branches: statics, which deals with forces acting on and in a body at rest; kinematics, which describes the possible motions of a body or system of bodies; and kinetics, which attempts to explain or predict the motion that will occur in a given situation. Alternatively, mechanics may be divided according to the kind of system studied. The simplest mechanical system is the particle, defined as a body so small that its shape and internal structure are of no consequence in the given problem. More complicated is the motion of a system of two or more particles that exert forces on one another and possibly undergo forces exerted by bodies outside of the system.

The principles of mechanics have been applied to three general realms of phenomena. The motions of such celestial bodies as stars, planets, and satellites can be predicted with great accuracy thousands of years before they occur. (The theory of relativity predicts some deviations from the motion according to classical, or Newtonian, mechanics; however, these are so small as to be observable only with very accurate techniques, except in problems involving all or a large portion of the detectable universe.) As the second realm, ordinary objects on Earth down to microscopic size (moving at speeds much lower than that of light) are properly described by classical mechanics without significant corrections. The engineer who designs bridges or aircraft may use the Newtonian laws of classical mechanics with confidence, even though the forces may be very complicated, and the calculations lack the beautiful simplicity of celestial mechanics. The third realm of phenomena comprises the behaviour of matter and electromagnetic radiation on the atomic and subatomic scale. Although there were some limited early successes in describing the behaviour of atoms in terms of classical mechanics, these phenomena are properly treated in quantum mechanics.

Classical mechanics deals with the motion of bodies under the influence of forces or with the equilibrium of bodies when all forces are balanced. The subject may be thought of as the elaboration and application of basic postulates first enunciated by Isaac Newton in his *Philosophiae Naturalis Principia Mathematica* (1687), commonly known as the *Principia*. These postulates, called Newton's laws of motion, are set forth below. They may be used to predict with great precision a wide variety of phenomena ranging from the motion of individual particles to the interactions of highly complex systems. A variety of these applications are discussed in this article.

In the framework of modern physics, classical mechanics can be understood to be an approximation arising out of the more profound laws of quantum mechanics and the theory of relativity. However, that view of the subject's place greatly undervalues its importance in forming the context, language, and intuition of modern science and scientists. Our present-day view of the world and man's place in it is firmly rooted in classical mechanics. Moreover, many ideas and results of classical mechanics survive and play an important part in the new physics.

The central concepts in classical mechanics are force, mass, and motion. Neither force nor mass is very clearly defined by Newton, and both have been the subject of much philosophical speculation since Newton. Both of them are best known by their effects. Mass is a measure of the tendency of a body to resist changes in its state of motion. Forces, on the other hand, accelerate bodies, which is to say, they change the state of motion of bodies to which they are applied. The interplay of these effects is the principal theme of classical mechanics.

Although Newton's laws focus attention on force and mass, three other quantities take on special importance because their total amount never changes. These three quantities are energy, (linear) momentum, and angular momentum. Any one of these can be shifted from one body or system of bodies to another. In addition, energy may change form while associated with a single system, appearing as kinetic energy, the energy of motion; potential energy, the energy of position; heat, or internal energy, associated with the random motions of the atoms or molecules composing any real body; or any combination of the three. Nevertheless, the total energy, momentum, and angular momentum in the universe never changes. This fact is expressed in physics by saying that energy, momentum, and angular momentum are conserved. These three conservation laws arise out of Newton's laws, but Newton himself did not express them. They had to be discovered later.

It is a remarkable fact that, although Newton's laws are no longer considered to be fundamental, nor even exactly correct, the three conservation laws derived from Newton's laws—the conservation of energy,