ESPACIO CURRICULAR: Inglés Técnico 3 (Electromecánica)

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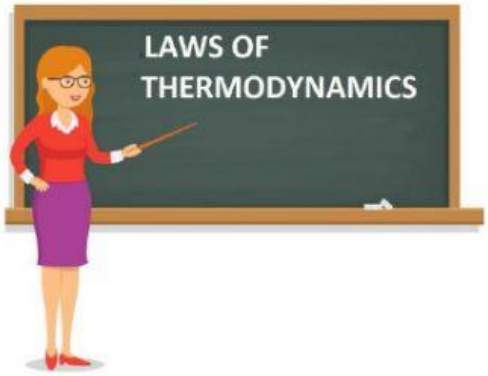


Student`s Name:.....

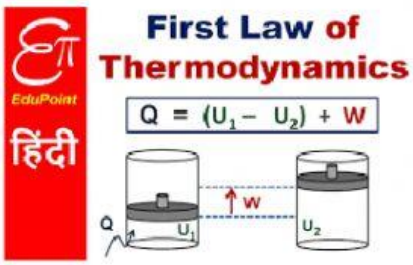
Course:.....

Date:.....

LAWS OF THERMODYNAMICS

Scientists Nearing Absolute Zero

(1) Los Angeles- scientists believe they are near to creating a temperature close to zero degrees **Kelvin**, the theoretical condition known as absolute zero wherein a **system** contains no **internal energy**. This sounds impressive, but most readers probably don`t understand the Laws of Thermodynamics, so let`s run through some of the basics:



(2) The **First Law of Thermodynamics** deals with the **conservation of energy**. It says that energy can be changed, but it can never be created or destroyed. The **Second Law of Thermodynamics** addresses **entropy**, which is the measure of how organized a system is. Absolute zero would involve entropy reaching its minimum value. The **Third Law of Thermodynamics** states that attending absolute zero is impossible. A system at absolute zero could not reach **equilibrium** with the systems around it, because if it received any of their energy through the transfer of **heat**, it would no longer be at zero.

(3) But even though absolute zero cannot be reached, the team of scientists is seeing how close they can come to it. They say this research is valuable because it helps them understand deep space, a place that consistently experiences temperatures near absolute zero. Creating these conditions in a laboratory allows these scientists to study processes and reactions that they could only imagine before.

A) Read the newspaper article. Then choose the correct answer:

1. What is the article mostly about?

a) a scientific experiment

b) methods of decreasing entropy

c) the achievement of equilibrium

d) the importance of conserving energy

2. A system`s organization is measured by

a) internal energy

b) equilibrium

c) entropy

d) temperature

3. What can be inferred about the experiment?

a) It has been made performed in outer space too

b) It has been continuing for several months

c) It has made little progress towards its goal

d) It will never reach absolute zero

B. Vocabulary: Match the words (1-7) with the definitions (A-G)

1).....1st Law of Thermodynamics	A) a concept that addresses entropy
2).....2nd Laws of Thermodynamics	B) a set of separate bodies that form a whole
3).....3rd Law of Thermodynamics	C) a concept that addresses the conservation of energy
4) .....temperature	D) energy resulting from the motion of substance`s molecules
5).....heat	E) a concept stating that systems can`t reach absolute zero
6).....internal energy	F) the measure of the kinetic energy in matter
7).....system	G) the transfer of energy from one system to another

C. Translate *paragraph number 2* from the text: "*Scientists Nearing Absolute Zero*"

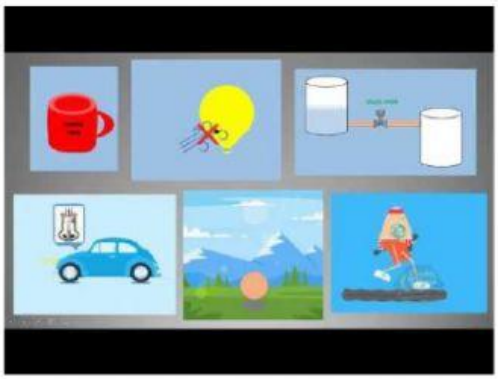
D. Watch the following video and order the explanation:

https://youtu.be/Bz6vexpZItw

(.....) This Coal is just a type of rock but for scientists this rock contains an energy that produced HEAT Energy when it undergoes a complete combustion. Actually some powerplant utilizes this coal to generate electrical energy or what we call as electricity.
(.....) Now the heat energy, will transfer its energy to a water above it making it into a steam, and this steam will rotate a Turbine (and that's a Mechanical Energy right there) and then this Turbine will rotate a Generator which converts that energy into Electrical Energy.
(.....) Don't overthink this too much, this law is all about HEAT as energy, and follows the law of conservation of energy and that's it.
(.....) Now to appreciate the application of this law let's try a very good one example.
(.....) What they do is that they feed this coal into a boiler furnace and with an assistance of oxygen and a little heat, this creates a combustion in a form of heat energy.
(..1....) The first of law of thermodynamic says that heat is a form of energy, and as what all other forms of energy is subject to, it follows the law of conservation of energy.
So what does this mean? It means that Heat Energy also cannot be created nor destroyed and can only be transferred to one form or another.

E. Watch the following video and match:

https://youtu.be/w6VNUYIUV3s



The Major statements for the second law are the following:

Clausius Statement;	It is impossible for any system to operate in a thermodynamic cycle and deliver a net amount of energy by work to its surroundings while receiving energy by heat transfer from a single reservoir
Kelvin-Plank Statement;	It is impossible for any system to operate in a way that entropy is destroyed
Entropy Statement;	It is impossible for any system to operate in such a way that the sole result would be an energy transfer by heat from a cooler to a hotter body