Name: Class:

Total Possible Marks: 33

Energy Stores and Transfers

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1. When energy is transferred to an object, the energy is stored in one of the objects "energy stores". Look at the list of energy stores below and match each one with its corresponding definition:

A. __a__ Thermal	a.	Any object. The hotter it is, the more energy it has in this store you may also see these types of energy stores called "internal energy stores".
B. __b__ Kinetic	b.	Anything moving has energy in this store
C. __c__ Chemical	c.	Anything that can release energy by a chemical reaction for example foods or fuels.
D. __d__ Gravitational potential	d.	Anything that has mass and is inside a gravitational field.
E. __e__ Elastic potential	e.	Anything that is stretched or compressed, for example a spring.
F. __f__ Electrostatic	f.	Anything with electric charge that is interacting with another electric charge for example two charges that attract or repel each other.
G. __g__ Magnetic	g.	Anything magnetic that is interacting with another magnetic item.
H. __h__ Nuclear	h.	Atomic nuclei have energy in this store which can be released in nuclear reactions.

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2. A (a) system is just an alternative word for a (b) single object or a (c) group of objects that you might be interested in. In a (d) closed system, neither (e) matter nor energy can (f) enter or leave, the net change in the (g) total energy of a closed system is always (h) zero. When a system (i) changes, energy is (j) transferred. It can be transferred into or away from the system, between different (k) objects in the system, or between different types of energy (l) stores.

stores	*enter*	*transferred*	*single*	*group*	*total*
objects	*closed*	*zero*	*system*	*changes*	*matter*

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3. "Work done" is just another way of saying "energy transferred".

* This is true, they are the same thing. Work can be done by a moving charge e.g. work done against the resistance in the circuit, or by a force moving object through a displacement

(A) True

(B) False

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4.

Look at the picture of a child's "Jack in the box" toy. In a short paragraph, give an account of the energy changes/energy transfers when the toy is set and subsequently activated.

* When the lid of the Jack in the box is closed, the spring has to be compressed [1] for this to take place. Elastic potential energy now exists in the elastic potential energy store of the toy's spring [1]. When the lid is opened, energy is transferred mechanically from the elastic potential energy store of the spring to the kinetic energy store of the clown [1] as the spring extends. The kinetic energy of the clown will dissipate [1] as it stops bobbing up and down on the spring until the point where it stops. At this point the elastic potential energy in the spring is lost [1] and the kinetic energy imparted to the clown is also lost [1]. Note that the energy has not been created or destroyed [1] but has simply been transferred [1] to other energy stores.

When the lid of the Jack in the box is closed, the spring has to be compressed for this to take place. Elastic potential energy now exists in the elastic potential energy store of the toy. When the lid is opened, energy is transferred mechanically from the elastic potential energy store of the spring to the kinetic energy store of the clown as the spring extends. The kinetic energy of the clown will dissipate as it stops bobbing up and down on the spring until the point where it stops. At this point the elastic potential energy in the spring is lost and the kinetic energy imparted to the clown is also lost. Note that the energy has not been created or destroyed but has simply been transferred to other energy stores.

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5. Energy can be transferred between energy stores in one of 4 different ways. Look at the names of the 4 different ways, and match each with its corresponding correct definition.

A.	b	Mechanically	a. Energy transferred from a hotter object to a cooler object, for example heating a pan of water on the hob.
B.	d	Electrically	b. An object moving due to a force acting on it, for example pushing, pulling, stretching or squashing.
C.	a	By heating	c. Energy transferred by for example light or sound waves, for example energy from the sun reaching the earth by light.
D.	c	By radiation	d. A charge (current) moving through a potential difference, for example charges moving around a circuit.