Extras

Regulation Tossups

(1)   A quantum mechanical counterpart of this law is known as Ehrenfest's Theorem. The substitution of one quantity in this equation can lead to a theorem that relates impulse to the change in momentum. This law is applied when a quantity in its central equation is non-zero for multiple entities on a free-body diagram. A fixed quantity and two similarly directed vectors appear in this formula, which is part of a set that includes a "law of inertia" and another formulation that describes the inverse relationship of reactions. For the point, name this law, often simply stated as F = ma.

ANSWER: **Newton**'s **Second** Law of Motion (prompt on "Newton's Laws" of Motion; prompt on partial answers)

(2)   Carbonyl groups are removed in a type of this reaction named for Wolff and Kishner. Sodium borohydride and lithium aluminum hydride are readily used to carry out this type of reaction by converting nitriles into amines, and aldehydes into alcohols. Hydrogenation is a specific type of this reaction, which occurs at the cathode of a galvanic cell and decreases a metal's oxidation state. For the point, name this type of reaction in which a species gains electrons, which is contrasted with oxidation.

ANSWER: **Reduction** Reaction (accept **Hydrogenation** Reaction; prompt on "Redox" or "Oxidation-Reduction")

(3)   In dermatology, this word refers to a break in otherwise continuous skin, as seen in the feet of diabetes patients. This word is the proper name for the aphthae of the mouth, which are also known as canker sores. The fundic mucosa and duodenum are usually the site of the stress and peptic forms of these things. For the point, identify these sores, the gastric type of which can be caused by the bacteria *H. pylori*.

ANSWER: **Ulcer**s (accept Aphthae before mentioned; accept Peptic **Ulcer** or Stress **Ulcer** or Gastric **Ulcer**)

(4)   The namesake "rag" of these ecosystems is a type of limestone used for construction in East Africa. The Department of the Interior operated a program which uses Defunct oil rigs that are used to create this type of ecosystem through a process called "toppling" that uses a team of divers. In Darwin's *Structure and Distribution of* [these ecosystems], he posits a paradox that wonders how these ecosystems can thrive in nutrient poor tropical waters. An increase in global water temperatures has led to the collapse of, for the point, what type of ocean ecosystem made of a colony of polyps?

ANSWER: Coral **Reef**s (accept Artificial **Reef**s; accept "Rigs-to-**Reef**s; accept Coral **Reef** Rag)

(5)   According to the Joule-Lenz Law, the square of this quantity is proportional to the power of heating. A device named for Walter Rogowski measures one form of this quantity, which can also be found in a contact-free manner through the use of its namesake clamp. The positive form of this quantity can be denoted by an arrow symbolizing the reference direction, and a galvanometer can be used to measure this quantity, which in one formula is given by dividing V by R. For the point, name this quantity represented with a capital I and measured in amperes.

ANSWER: Electric **Current** (prompt on "I")

(6)   This Period 6 pnictogen [[NIK-toh-jen]] is the main component of the alloys Cerrosafe [[SEH-roh-safe]] and Rose's metal, both of which melt below 100 degrees Celsius. This element's most common isotope, with a mass number of 209, has a half-life of about two times ten to the nineteenth years. This metal's subsalicylate [[sub-sal-ih-SY-late]] is used in many anti-diarrheal medicines but is not itself naturally pink. For the point, name this post-transition element, number 83 on the periodic table between lead and polonium.

ANSWER: **Bismuth**

(7)   Prior to a 2020 revision, the World Health Organization used this number to characterize different pandemic phases to develop a global preparedness plan. This number is a solution to the two-dimensional kissing problem, and this value is also the Messier number for the *Butterfly Cluster*. This even, perfect number that was first traced from the Edicts of Ashoka gives the number of varieties of both quarks and leptons. For the point, identify this number, the atomic number of carbon, as well as the total sides in a hexagon.

ANSWER: **Six**

Extra Questions