Exam

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) The *most essential* compound needed to sustain life as we know it is _____. 1) _____
A) carbohydrates
B) ozone
C) oxygen
D) water
E) carbon dioxide
Answer: D

2) What is an element? 2) _____
A) two or more atoms held together by chemical bonds
B) one or more molecules held together by chemicals
C) a chemical that cannot be broken down or separated into other chemicals
D) a chemical that cannot be separated, but is limited in supply
E) a chemical that can be broken down or separated into other chemicals
Answer: C

3) What is the basic subunit of elements? 3) _____
A) electrons B) molecules C) neutrons D) atoms E) protons
Answer: D

4) Molecules are _____. 4) _____
A) atoms of an element
B) basic subunits of elements
C) a chemical that cannot be broken or separated
D) positively charged particles
E) two or more atoms held together by chemical bonds
Answer: E

5) Which is the most important molecule in the ecosystem? 5) _____
A) lead B) salt C) nitrogen D) oxygen E) water
Answer: E

6) Compounds are _____. 6) _____
A) molecules that are made of more than one element
B) atoms that are electrically charged
C) molecules that have mass
D) molecules that are held together by atoms
E) atoms that are radioactive
Answer: A

7) Cells and tissues of all organisms are made primarily of _____. 7) _____

A) water
B) cellulose
C) carbon dioxide
D) hydrogen
E) salt

Answer: A

8) Which number indicates neutral on a pH scale? 8) _____

A) 1 B) 5 C) 3 D) 9 E) 7

Answer: E

9) Most organic compounds are made up of _____. 9) _____

A) nitrogen, oxygen, and carbon dioxide atoms
B) carbon, hydrogen, and oxygen atoms
C) carbon, nitrogen, and water atoms
D) carbon, hydrogen, and nitrogen atoms
E) carbon, nitrogen, and ozone atoms

Answer: B

10) The stratospheric ozone layer is important to ecosystems because it _____. 10) _____

A) keeps atmospheric gases balanced
B) absorbs and scatters UV light
C) keeps the temperature of Earth stable
D) ensures lakes and oceans do not lose water
E) provides the air we breathe

Answer: B

11) The most basic source of immediate energy for most organisms is _____. 11) _____

A) lipids
B) starches
C) water
D) glucose
E) amino acids

Answer: D

12) The pH scale is a quantitative representation of the relative amounts of _____. 12) _____

A) hydrogen and hydroxyl ions in solution
B) alkaline and basic ions in solution
C) hydrogen and polar water molecules in solution
D) water and carbon dioxide molecules in solution
E) hydrogen and oxygen ions in solution

Answer: A

13) Natural gas is primarily composed of _____. 13) _____

A) carbon dioxide
B) oxygen
C) methane
D) hydrogen
E) nitrogen

Answer: C

14) What is the primary structural constituent in plant tissues? 14) _____

A) starch
B) protein
C) chlorophyll
D) enzymes
E) cellulose

Answer: E

15) What is something that you use almost every day that is a polymer? 15) _____

A) wood B) metal C) gas D) water E) plastic

Answer: E

16) Energy is the _____. 16) _____

A) motion that moves things
B) amount remaining to do work in the future
C) work that has been done
D) chemical bonds between atoms and molecules
E) capacity to do work

Answer: E

17) The first law of thermodynamics states that _____. 17) _____

A) entropy always decreases in normal chemical reactions
B) energy is always degraded in a chemical reaction
C) although energy can be transformed from one form to another, it cannot be created or destroyed in normal chemical reactions
D) energy is always recycled in ecosystems
E) all energy always has kinetic and potential characteristics

Answer: C

18) Most ocean ridges coincide with _____. 18) _____

A) convergent plate boundaries
B) oceanic plates
C) divergent plate boundaries
D) transforming boundaries
E) continental plates

Answer: C

19) The energy of light is called electromagnetic radiation. In the electromagnetic spectrum, photosynthesis makes use of which specific wavelengths? 19) _____

A) infrared radiation
B) X-rays
C) the entire electromagnetic spectrum
D) visible light
E) ultraviolet radiation

Answer: D

20) Heat energy refers to the kinetic energy of molecules. Heat can move in a number of different ways: when warm air rises causing the gas or liquid to circulate, the process that is said to occur is _____. 20) _____

A) evaporation
B) conduction
C) latent heat transfer
D) convection
E) radiation

Answer: D

21) What are the three distinct layers of the earth? 21) _____

A) mantle, crust, oceanic crust
B) mantle, magma, crust
C) core, mantle, crust
D) core, mantle, magma
E) oceanic crust, mantle, magma

Answer: C

22) What makes up about 70% of the Earth's total volume, as it relates to the Earth's structure? 22) _____

A) lithosphere
B) magma
C) mantle
D) oceanic crust
E) crust

Answer: C

23) What parts of the Earth's crust float on top of the mantle? 23) _____

A) oceans
B) lithosphere
C) stratosphere
D) ozone layer
E) tectonic plates

Answer: E

24) The type of tectonic plate boundary at the Mid-Atlantic Ridge is referred to as a _____. 24) _____

A) transform fault
B) seismic boundary
C) convergent boundary
D) divergent boundary
E) subduction zone

Answer: D

25) The Earth's atmosphere is mostly composed of _____. 25) _____

A) nitrogen and oxygen
B) oxygen and carbon dioxide
C) water and carbon dioxide
D) nitrogen and carbon dioxide
E) water and oxygen

Answer: A

26) _____ is the tendency toward a disordered state. 26) _____

A) Kinetic energy
B) Entropy
C) Convection
D) Heat
E) Potential energy

Answer: B

27) _____ are synthesized in a two-step process: transcription and translation. 27) _____

A) Genes
B) Nucleic acids
C) Carbohydrates
D) Proteins
E) Lipids

Answer: D

28) Starch and cellulose are examples of _____. 28) _____

A) carbohydrates
B) lipids
C) nucleic acids
D) sterols
E) proteins

Answer: A

29) Light is a form of _____radiation. 29) _____

A) gamma
B) infrared
C) X-ray
D) UV
E) electromagnetic

Answer: E

30) The unit that measures the amount of energy required to raise the temperature of 1 g of water 1°C is the _____. 30) _____

A) watt-hour
B) calorie
C) volt
D) joule
E) kilowatt-hour

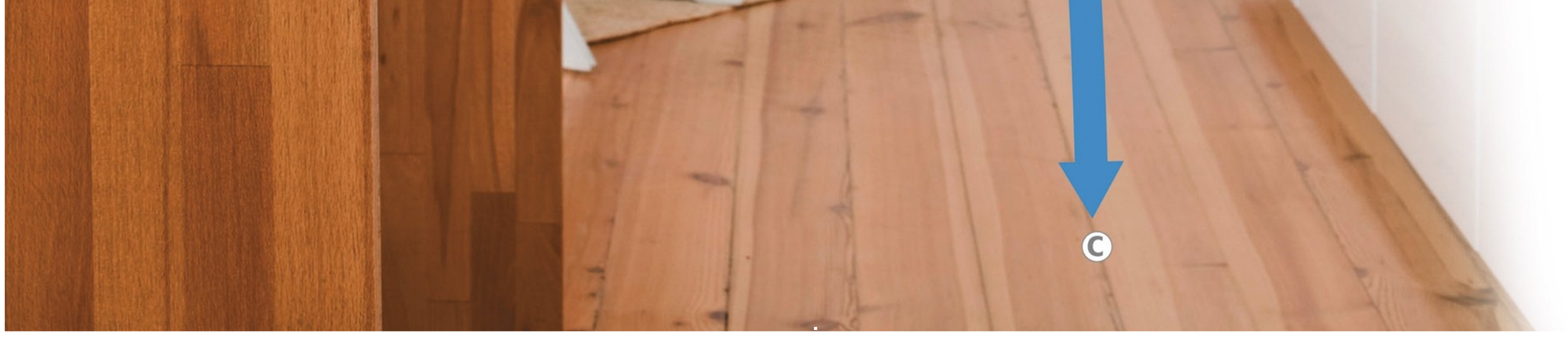
Answer: B

31) The type of ocean current that is driven by differences in temperature and salinity is a _____ circulation. 31) _____

A) thermohaline
B) Hadley cell
C) Ferrel cell
D) gyre
E) Coriolis effect

Answer: A


A
B
C



32) When the vase is sitting on top of the table, what type of energy exists? 32) _____

A) work
B) potential energy
C) kinetic energy
D) heat energy
E) entropy

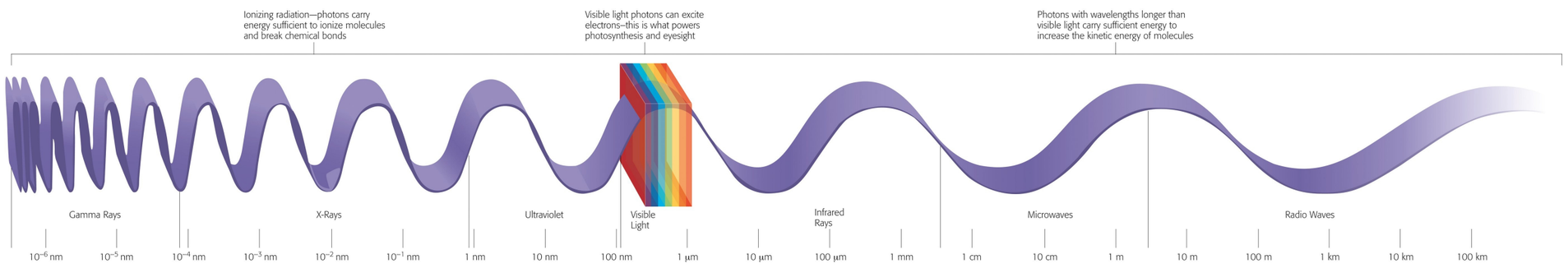
Answer: B

33) When the vase falls to the floor, what happens to the energy in the system? 33) _____

A) The entropy within the system remains constant during the fall.
B) The kinetic energy is converted to heat energy that causes the vase to break.
C) The potential energy is converted into kinetic energy.
D) The kinetic energy is converted into potential energy.
E) The potential energy causes the entropy in the system to change causing disorder.

Answer: C

34) Which of the rays/waves along the wavelength contains the most energy? 34) _____



A) X-rays
B) infrared rays
C) microwaves
D) ultraviolet rays
E) gamma rays

Answer: E

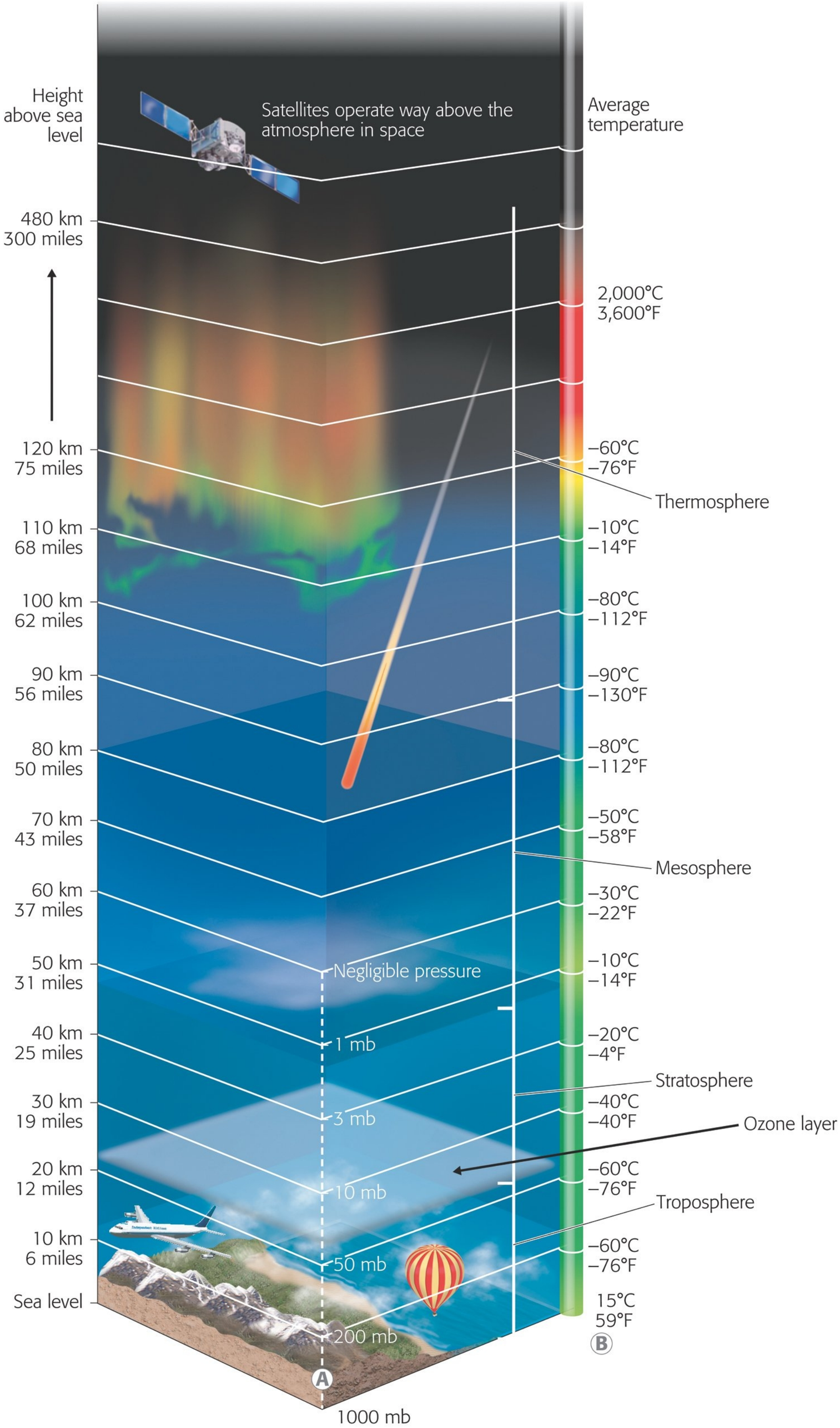
35) Use the energy conversions table to determine how many joules (J) a 60-Watt light bulb uses in one hour. 35) _____

	Joules (J)	Calories (c)	Watt-hours (Wh)
A joule (J) =	1	0.24	0.00028
A calorie (c) =	4.18	1	0.0012
A watt-hour (Wh) =	3,600	861	1

A) 72,000 J B) 144,000 J C) 294,000 J D) 216,000 J E) 252,000 J

Answer: D

36) Where in the Earth's atmosphere are chemicals most likely to be dispersed and present for a long period of time? 36) _____



A) troposphere
B) mesosphere

C) thermosphere
D) stratosphere
E) ozone layer

Answer: D

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

37) Match each term with the correct description. 37) _____

I. Protons
II. Neutrons
III. Electrons
IV. Isotopes
V. Molecules

A. Negatively charged particles of the central nucleus of an atom
B. Electrically neutral particles of the central nucleus of an atom
C. Positively charged particles of the central nucleus of an atom
D. Two or more atoms held together by a chemical bond
E. Atoms of an element with different numbers of neutrons

Answer: I. C, II. B, III. A, IV. E, V. D

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Read the accompanying scenario and answer the following questions.

The human body has the capacity to do work or engage in energy each day. Answer the following questions about the energy you have as you run a triathlon.

38) When you are resting at the top of a hill on a bicycle prior to racing down the hill you have _____ energy for movement. 38) _____
A) potential B) nuclear C) chemical D) kinetic E) mechanical

Answer: A

39) When the race begins and your body starts to move, the energy of _____ allows you to run and complete the race. 39) _____
A) work B) motion C) fusion D) heat E) fission

Answer: B

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

40) So far as we know, Earth is the only planet in our solar system that supports life. Describe/explain four major factors/characteristics unique to Earth, allowing for the evolution and support of life.

Answer: The presence of water is often cited as the first critical factor, as all life we are familiar with requires water to live. The presence of water in a liquid state, especially in Earth's vast oceans, plays a central role in maintaining temperatures that support life, as these large liquid reservoirs help to moderate any extreme temperature fluctuations. Water vapor in the atmosphere also influences the extent of evaporation and precipitation, allowing water to cycle across the planet's surface.
A second critical factor is our unique distance from the sun (93 million miles). At this distance, the sun's energy and resulting temperature are not extreme, allowing organic compounds to form and life to flourish. A third critical factor was the evolution of photosynthetic organisms, which ultimately decreased the original concentrations of carbon dioxide and increased oxygen concentrations in the atmosphere, allowing a great diversity of life to evolve over the past 3.8 billion years. A fourth unique factor is the magnetic field arising from convection currents in the Earth's core and the Earth's rotation. This magnetic field deflects the lethal ionizing radiation from solar winds, to which other planets in our solar system are regularly subjected.

41) Describe how heat moves as you boil a pot of water to cook spaghetti for dinner.

Answer: Heat moves in four ways, conduction, convection, radiation, and latent. When water is boiling the source of conduction is the gas or electricity on the stove, it provides the heat that will help to allow the molecules of water to boil. Convection happens as the warm regions in the water become less dense and begin to rise, causing the boiling to begin. Radiation releases electromagnetic energy that is felt from the heat source and latent heat transfer occurs as the water evaporates as it boils, giving of steam that we might see.