CLEP Natural Sciences Practice Test

Time—90 Minutes 120 Questions	For each question below, choose the best answer from the choices given.

1. Photosynthesis is a process in which plants convert

(A) sugar into energy
(B) ADP into ATP
(C) fructose into glucose
(D) carbon dioxide and water into sugar
(E) water into peroxide

2. Chloroplasts and mitochondria have the following property in common.

(A) Both are involved in protein synthesis
(B) Both are involved in energy generation in the cell
(C) Both are involved in regulating ion concentration in the cell
(D) Both are involved in the transcription of DNA into RNA
(E) Their functions are not related

3. In cellular respiration

(A) glucose is synthesized from carbon dioxide and water
(B) glucose is broken down into water and energy is consumed
(C) glucose is broken down and energy is created in the form of ATP
(D) glycolysis occurs, leading to the formation of ethanol
(E) pyruvic acid is converted into glucose

4. Which of the following is found in prokaryotic cells only?

(A) DNA
(B) Ribosomes
(C) Nucleoid region
(D) Golgi apparatus
(E) Cytoplasm

5. Proteins are synthesized on

(A) mitochondria
(B) ribosomes
(C) centrioles
(D) RNA
(E) the plasma membrane

6. Chromatin consists of

(A) DNA and proteins
(B) RNA and proteins
(C) RNA and enzymes
(D) DNA and RNA
(E) DNA only

7. The first step in cell division is

(A) division of the cytoplasm
(B) alignment of the centrioles
(C) duplication of the chromosomes
(D) formation of mitotic spindles
(E) dissolution of the nuclear membrane

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8. An animal cell contains M chromosomes. After mitotic cell division, each daughter cell contains _____ chromosomes.

(A) 2M
(B) M/2
(C) M
(D) 3M
(E) 4M

9. Cancer cells are characterized by

(A) not exhibiting contact inhibition
(B) excess cytoplasm
(C) twice the number of chromosomes
(D) half the number of chromosomes
(E) controlled cell division

10. The sequence from gene to protein in eukaryotic cells is

(A) Golgi apparatus, RNA, DNA, ribosomes
(B) DNA, RNA, ribosomes, Golgi apparatus
(C) DNA, Golgi apparatus, RNA, ribosomes
(D) RNA, ribosomes, DNA, Golgi apparatus
(E) DNA, ribosomes, RNA, Golgi apparatus

11. The genetic code is

(A) different for all living organisms
(B) universal for all living organisms
(C) the same only for some genes for some organisms
(D) the same for animals grouped in the same family
(E) the same for animals in the same species

12. DNA and RNA have all of the following in common except

(A) the base pairs G and C
(B) double helix structure
(C) nucleotide bases
(D) phosphate groups
(E) a 5' end and a 3' end

Questions 13–15

Mendel studied the following three traits: seed shape, flower position, and stem length.

Trait	Dominant Gene	Recessive Gene
Seed Shape	Round (R)	Wrinkled (r)
Flower Position	Axial (A)	Terminal (a)
Stem Length	Tall (L)	Dwarf (l)

13. If a plant that is heterozygous for the flower position trait is fertilized with a plant that is homozygous for the recessive flower position trait, what proportion of the offspring will be heterozygous for the trait?

(A) 0%
(B) 25%
(C) 50%
(D) 75%
(E) 100%

14. If a plant that is heterozygous for seed shape and stem length traits self-fertilizes, the proportion of offspring that will be homozygous for both traits is

(A) 1/16
(B) 1/4
(C) 1/2
(D) 3/4
(E) 1/8

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15. Plants with phenotype round seed shape and tall stem length are only fertilized with plants of wrinkled seed shape and dwarf stem length, and the same fertilization pattern is followed for the successive generations. Which of the following statements is true?

(A) The frequencies of the dominant genes will increase
(B) The frequencies of the dominant genes will remain the same
(C) The frequencies of the recessive genes will decrease
(D) The frequencies of the recessive genes will increase
(E) There will be no changes in the frequencies of dominant and recessive genes

16. When a red snap dragon flower is pollinated using pollen from a white snap dragon, the following number of flowers and colors is observed: 23 red, 20 white, 57 pink. The genotype of the pink flowers is

(A) RR
(B) WW
(C) RW
(D) Cannot be determined from the information provided
(E) More than one gene is involved

17. Parents with blood types A and B have an offspring with type A blood. What are the probable genotypes of the parents?

(A) AO BB
(B) AB BB
(C) AO BO
(D) AA BB
(E) Cannot be determined from the information provided

18. The gene for a lethal disease is carried on the X chromosome. What is the probability that a woman who is a carrier passes this gene to her son?

(A) 100 %
(B) 75 %
(C) 50 %
(D) 25 %
(E) 33 %

19. Which of the following tissue types covers the outside of the body and lines the internal organs and cavities?

(A) Epithelial
(B) Connective
(C) Skeletal muscle
(D) Smooth muscle
(E) Neuron

20. Which of the following issue types that sends signals throughout the body?

(A) Epithelial
(B) Connective
(C) Skeletal muscle
(D) Smooth muscle
(E) Nervous

21. Which of the following tissue types is responsible for contractions that move food along the intestines?

(A) Epithelial
(B) Connective
(C) Skeletal muscle
(D) Smooth muscle
(E) Neuron

22. Blood consists of the following tissue types except

(A) white cells
(B) red cells
(C) platelets
(D) collagen
(E) plasma

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23. Different cell types have

(A) the same DNA
(B) different types of DNA
(C) a small percentage of the total DNA
(D) only the genes that code for its cell type
(E) the same RNA

24. Which animal has radial symmetry?

(A) Monkey
(B) Tadpole
(C) Starfish
(D) Centipede
(E) Snake

25. Which of the following would NOT be found in an animal with bilateral symmetry?

(A) Dorsal side
(B) Anterior
(C) Posterior
(D) 3 axes of symmetry
(E) Ventral side

26. Which of the following is NOT a neurotransmitter?

(A) Epinephrine
(B) Serotonin
(C) Dopamine
(D) Caffeine
(E) Acetylcholine

27. Allergies occur when

(A) the circulatory system slows down
(B) the immune system launches an inflammatory response
(C) the immune system is not sensitive enough to foreign invaders
(D) the immune system recognizes a bacterium
(E) nerve cells begin to fire rapidly

28. In a tryptophan-rich environment, it is noticed the genes that code for proteins important in the bacteria's metabolic production of tryptophan are turned off. The bacteria are not producing tryptophan. In this example, tryptophan

(A) acts via a negative feedback loop
(B) acts via a positive feedback loop
(C) has a cascade effect
(D) has no effect
(E) is an enzyme

29. Select the arrangement that lists the items from smallest to largest components.

(A) Organ, organelle, tissue, cell
(B) Tissue, cell, organ, organelle
(C) Organelle, tissue, cell, organ
(D) Cell, tissue, organ, organelle
(E) Organelle, cell, tissue, organ

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30.

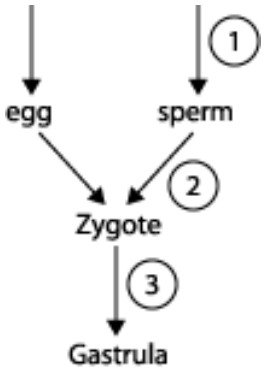

Figure 1

Select the answer that correctly fills in the blanks for the areas labeled 1, 2, and 3.

(A) Mitosis, fertilization, meiosis
(B) Fertilization, meiosis, mitosis
(C) Meiosis, fertilization, differentiation
(D) Meiosis, fertilization, mitosis
(E) Meiosis, mitosis, fertilization

31. Which organ is involved in filtering waste from the body?

(A) Heart
(B) Lungs
(C) Kidneys
(D) Pancreas
(E) Liver

32. A clone shares _____ of its genetic material with its parent.

(A) 0%
(B) 25%
(C) 50%
(D) 75%
(E) 100%

33. The role of hemoglobin is to carry ____ from the lungs to the tissues and ____ back to the lungs.

(A) oxygen, carbon dioxide
(B) carbon dioxide, oxygen
(C) oxygen, nitrogen dioxide
(D) carbon dioxide, nitrogen dioxide
(E) oxygen, ozone

34. Which of the following systems is responsible for producing antibodies to fight infection?

(A) Circulatory
(B) Nervous
(C) Digestive
(D) Limbic
(E) Immune

35. Which of the following does NOT act to increase genetic diversity?

(A) Mutations
(B) Crossing over of chromosomes in meiosis
(C) Selective breeding
(D) Sexual reproduction
(E) Random mating

36. Darwin's theory of evolution can be described best by

(A) descent without modification
(B) descent with modification
(C) inheritance of acquired traits
(D) random genetic mutations
(E) unlimited natural resources

37. Natural selection occurs due to

(A) random genetic mutations
(B) acquired traits
(C) differential success in reproduction
(D) equal reproductive success
(E) survival of the least fit

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38. The breeding of race horses is an example of

(A) natural selection
(B) selective breeding
(C) Lamarck's theory of inheritance
(D) increased genetic diversity
(E) unlimited natural resources

39. Genetic tests can resolve ambiguities about whether a trait is homologous or analogous because

(A) the closer the DNA base sequence, the more likely two genes originate from a common ancestor
(B) the sequence of base pairs in DNA is not relevant
(C) the more divergent the sequence of DNA base pairs, the more closely related two species are
(D) the closer the sequence of DNA base pairs, the less related the species are
(E) proteins determine relatedness, not DNA

40. The bottleneck effect occurs when natural disasters such as earthquakes or floods drastically reduce the size of a population. Which of the following best describes the resulting effect on the gene pool of the surviving population?

(A) The surviving population is representative of the original population in its genetic makeup.
(B) Natural selection guarantees the least fit will survive.
(C) The surviving population is not representative of the original population in its genetic makeup.
(D) Mutations are more likely to occur.
(E) Genetic variability increases.

41. Which ordering correctly represents the appearance of these types of organisms from oldest to the most recent?

(A) Land plants, reptiles, mammals, marine invertebrates
(B) Marine invertebrates, reptiles, mammals, land plants
(C) Reptiles, land plants, marine invertebrates, mammals
(D) Marine invertebrates, land plants, mammals, reptiles
(E) Marine invertebrates, land plants, reptiles, mammals

42. The common scientific name for the red maple tree is *Acer rubrum*. This name includes which of the following classification divisions?

(A) Family, species
(B) Genus, species
(C) Family, genus
(D) Phylum, order
(E) Phylum, species

43. Two organisms are more related if they share which of the following classification divisions?

(A) Phylum
(B) Class
(C) Order
(D) Family
(E) Kingdom

44. Which of the following is an example of natural selection?

(A) Son having the same blood type as his mother
(B) The development of pesticide-resistant bacteria
(C) Father and son developing large muscles from weight lifting
(D) Daughter does not inherit gene for cancer
(E) Children of two parents are shorter than the parents

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Questions 45–46

A small number of rabbits were brought to a farm in Victoria Australia in 1859. The rabbit population quickly exploded from a few to millions in a short period of time. In the 1950's a virus carried by mosquitoes, myxoma, was introduced. This virus was initially lethal to 99.8% of the rabbit population exposed to it. Future outbreaks of the virus have not been as successful in reducing the rabbit population.

45. Which of the following statements is true about the rabbit population?

(A) Rabbits are able to reproduce faster than the death rate due to this virus.
(B) A genetic mutation occurred in the rabbit population that allowed the offspring to survive.
(C) Rabbits in regions without any mosquitoes spread to regions with the virus.
(D) Rabbits developed resistance to myxoma.
(E) Rabbits learned to avoid mosquito-infested regions.

46. Which of the following statements is NOT true about the virus?

(A) The virus coevolves with the rabbit population.
(B) The virus does not undergo any evolutionary pressure.
(C) The virus evolves to become less virulent along with the rabbit population evolving to become more resistant.
(D) Less virulent strains of the virus become more prevalent in the virus population.
(E) The rabbit-myxoma system, without any outside pressures, will coevolve to reach a stable equilibrium.

47. Which of the following is an example of coevolution?

(A) The evolution of reptiles and mammals
(B) The evolution of man
(C) The evolution of bacteria and viruses
(D) The evolution of sponges
(E) Birds consuming the fruit of plants and distributing the seeds

48. Which of the following is an example of a primary producer?

(A) Lion
(B) Deer
(C) Cyanobacteria
(D) Viruses
(E) Plankton

49. Which of the following statements is true about a community that has a high diversity (large number of species)?

(A) It is less complex and more stable than a community with low diversity
(B) It is less complex and less stable than a community with low diversity
(C) It is more complex and less stable than a community with low diversity
(D) It has the same complexity and stability as a community with low diversity
(E) It is more complex and more stable than a community with low diversity

50. Which of the following is NOT an abiotic factor in the environment?

(A) Sunlight
(B) Temperature
(C) Rain
(D) Vegetation
(E) Minerals

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51. Which type of organism comprises the largest amount of biomass in the energy pyramid?

(A) Decomposers
(B) Primary consumers
(C) Third-level consumers
(D) Producers
(E) Secondary consumers

52. Which of the following is an example of a human activity that has decreased biodiversity?

(A) Genetic modification of food
(B) Irradiation of food
(C) Crossing a plum and an apricot to create a pluot
(D) Planting a few types of wheat that compose 90% of the harvest
(E) Use of pesticides for pest control

53. The abiotic environment and biotic community together make up a/an

(A) habitat
(B) population
(C) ecosystem
(D) microcosm
(E) community

54. Half of all species on Earth are contained in the

(A) deserts
(B) oceans
(C) tundra
(D) tropical rainforests
(E) coniferous forests

55. Humans contribute to the extinction of species by which of the following mechanisms?

i) Habitat reduction and modification
ii) Overexploitation
iii) Introduction of exotic species

(A) i
(B) i and ii
(C) ii
(D) i, ii, iii
(E) ii and iii

56. Post World War II traffic in the South Pacific resulted in the introduction of the brown tree snake to the island of Guam, which was previously snake-free. Since the introduction of the brown tree snake many indigenous species of birds and lizards have disappeared. Which of the following statements best describes this situation?

(A) The brown tree snake is a well-adapted species
(B) The brown tree snake is a super-predator in the Guam ecosystem
(C) The brown tree snake is an effective scavenger
(D) This is an example of habitat destruction
(E) This is an example of an environment in stable equilibrium

57. Organisms in which type of relationship both benefit from their association?

(A) Mutualism
(B) Parasitism
(C) Commensalism
(D) Antagonism
(E) None of the above

58. What percentage of energy is passed on to each successive organism in the energy pyramid?

(A) 1%
(B) 10%
(C) 40%
(D) 60%
(E) 80%

59. Which of the following organisms is responsible for breaking down dead organisms and animal waste products?

(A) Primary consumer
(B) Secondary consumer
(C) Omnivore
(D) Producer
(E) Decomposer

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Questions 60 and 61 refer to graphs in figure 2

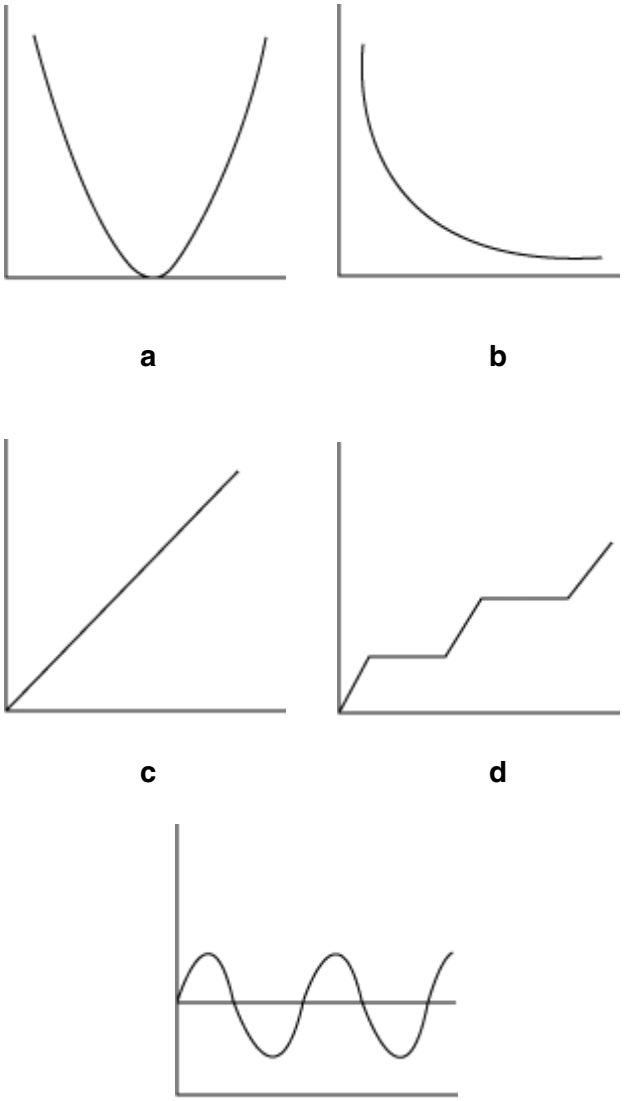

Figure 2

60. Graph that represents the velocity of a particle dropped from a height *h*.

61. Graph that represents the relationship between pressure and temperature of an ideal gas at constant volume.

62. Graph that represents the potential energy of a spring that follows Hooke's law.

63. When energy is added to an ideal gas, the kinetic energy of the particles

(A) decreases
(B) remains constant
(C) goes to zero
(D) increases
(E) fluctuates

64. In Einstein's famous equation $E = mc^2$, the c is equal to

(A) the charge on an electron
(B) the speed of light
(C) the charge of a proton
(D) the speed of sound
(E) the mass

65. Which of the following statements is true regarding a chemical reaction that occurs spontaneously?

(A) The free energy is positive
(B) The free energy is negative
(C) There is no change in the free energy
(D) The disorder/entropy of the system stays the same
(E) The disorder/entropy of the system decreases

66. An enzyme increases the amount of product formed by a chemical reaction by

(A) being consumed in the chemical reaction
(B) increasing the number of reactants in close contact to each other
(C) lowering the activation barrier for the chemical reaction
(D) lowering the free energy of the products
(E) lowering the free energy of the reactants

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67. At the top of the highest hill on an ideal roller coaster (no frictional forces) all of the energy is

(A) kinetic energy only
(B) kinetic and potential energy
(C) potential energy only
(D) kinetic energy and thermal energy
(E) potential energy and thermal energy

68. A child swings a yo-yo around his head in a circle. The direction of centripetal acceleration is

(A) in the direction of motion along the circle
(B) in the opposite direction of motion along the circle
(C) located at points tangent to the yo-yo's position
(D) directed along a line towards the center of the circle
(E) there is only linear acceleration

69. Glass is a/an

(A) ordered solid
(B) super cooled liquid
(C) liquid
(D) gas
(E) gel

70. During the winter, salt is spread on icy roads to

(A) lower the boiling point of water
(B) lower the melting point of ice
(C) increase the frictional forces between car tires and the road
(D) change the viscosity of water
(E) help remove water from the road

71. The entropy of a system is a measure of _____ of a system.

(A) the energy
(B) the pressure
(C) the temperature
(D) the disorder
(E) the electrical potential

72. The escape velocity of a rocket is

(A) the velocity required to break the speed of sound
(B) the velocity required to overcome the gravitational pull of the Earth
(C) the velocity required to propel the rocket into the atmosphere
(D) the speed of light
(E) the speed of sound

73. An object such as a spring undergoes simple harmonic motion. For an ideal spring there are no dissipative forces and the total energy of the system remains constant. In a particular system, a spring with a weight attached is anchored to a wall. The spring is stretched to its maximum distance and is released. Which of the following statements is NOT true for this system?

(A) The velocity of the particle is zero when the spring is fully stretched.
(B) The direction of acceleration of the particle is opposite the direction of motion.
(C) A plot of the displacement versus time is periodic.
(D) Mechanical energy is not conserved.
(E) The displacement, velocity, and acceleration all vary periodically with time but are not in phase.

74. The nucleus of an atom is made up of

(A) electrons and protons
(B) protons only
(C) protons and neutrons
(D) electrons and neutrons
(E) neutrons only

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75. Isotopes contain the same number of ____ but different numbers of _____.

(A) electrons, protons
(B) protons, neutrons
(C) neutrons, electrons
(D) protons, electrons
(E) neutrons, protons

76. The highest ionization energy occurs for which of the following atoms?

(A) Li
(B) Mg
(C) C
(D) N
(E) F

77. When an atom emits an alpha particle, its mass number _____ and its atomic number _____.

(A) decreases, decreases
(B) decreases, remains the same
(C) remains the same, remains the same
(D) decreases, increases
(E) remains the same, decreases

78. Which compound is the best conductor of electricity?

(A) Water
(B) Copper
(C) Diamond
(D) Graphite
(E) Silicon

79. The following particle is released in the nuclear decay process $^{238}_{92}\mathrm{U} \rightarrow {}^{234}_{90}\mathrm{Th} + \mathrm{X}$.

(A) Beta particle
(B) Gamma ray
(C) Alpha particle
(D) Positron
(E) Hydrogen atom.

80. What product is formed when $^{209}_{81}\mathrm{Tl}$ undergoes beta decay?

(A) $^{209}_{81}\mathrm{Tl}$
(B) $^{210}_{80}\mathrm{Hg}$
(C) $^{209}_{80}\mathrm{Hg}$
(D) $^{209}_{82}\mathrm{Pb}$
(E) $^{210}_{82}\mathrm{Pb}$

81. A gamma ray is a/an

(A) electron
(B) positron
(C) high-energy, invisible electromagnetic radiation
(D) helium nucleus
(E) low-energy, visible electromagnetic radiation

82. An atom which has high electronegativity will

(A) not want an additional electron
(B) will more readily accept an additional electron than an atom with low electronegativity
(C) will less readily accept an additional electron than an atom with high electronegativity
(D) repel electrons
(E) release a proton

83. The bond in NaCl is best described as a/an

(A) polar covalent
(B) non-polar covalent
(C) hydrogen bond
(D) ionic bond
(E) molecular bond

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84. Which of the following statements best describes the molecule CCl_4?

(A) It is a non-polar molecule with polar bonds.
(B) It is a non-polar molecule with non-polar bonds.
(C) It is a polar molecule with polar bonds.
(D) It is a polar molecule with non-polar bonds.
(E) It is an ionic molecule.

85. The reaction $HCl + NaOH \rightarrow H_2O + NaCl$ is an example of a

(A) redox reaction
(B) single replacement
(C) combustion reaction
(D) neutralization reaction
(E) nuclear reaction

86. Select the arrangement of bonds in order of least polar to most polar.

(A) C-F, C-Cl, C-H, C-C
(B) C-C, C-H, C-F, C-Cl
(C) C-C, C-H, C-Cl, C-F
(D) C-H, C-C, C-Cl, C-F
(E) C-C, C-F, C-Cl, C-H

87. Which of the following compounds has an isomer?

(A) CH_4
(B) CH_3CH_3
(C) $CH_3CH_2\ CH_2CH_3$
(D) CH_2CHCH_3
(E) CCl_2H_2

88. Chlorine has the highest oxidation state in which of these compounds?

(A) HCl
(B) HClO
(C) $HClO_4$
(D) $HClO_3$
(E) Cl_2

89. Of the following compounds, which one reacts the most vigorously with water?
(A) HCl
(B) Na
(C) Zn
(D) Fe
(E) Li

90. The bond that contains the most energy is

(A) H-H
(B) N≡N
(C) N=N
(D) C=C
(E) O=O

91. In the reaction $Zn + Cu^{+2} \rightarrow Cu + Zn^{+2}$
(A) Zn is oxidized and Cu is reduced
(B) Zn is oxidized and Cu is oxidized
(C) Zn is reduced and Cu oxidized
(D) Zn is reduced and Cu is reduced
(E) None of the above statements apply

92. The oxidation number of chromium in $Cr_2O_7^{-2}$ is
(A) 1
(B) 2
(C) 3
(D) 6
(E) 7

93. The two strands of DNA in the double helix are held together by
(A) covalent bonds
(B) ionic bonds
(C) hydrogen bonds
(D) strong forces
(E) weak forces

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94. Of the following compounds and elements, which one reacts most vigorously with water?
(A) HF
(B) NaOH
(C) Li
(D) K
(E) CO_2

95. Which are the gaseous planets?
(A) Mercury, Mars, Venus
(B) Mercury, Pluto, Uranus
(C) Jupiter, Mars, Saturn
(D) Jupiter, Saturn, Uranus
(E) Jupiter, Saturn, Venus

96. Which planet has the most elliptical orbit about the sun?
(A) Mars
(B) Pluto
(C) Jupiter
(D) Saturn
(E) Uranus

97. The length of a planet's day is determined by
(A) how fast it orbits the sun
(B) how large it is
(C) how much it weighs
(D) what materials it is composed of
(E) how fast it rotates about its axis

98. Which two planets do not have any moons?
(A) Mercury and Venus
(B) Mercury and Mars
(C) Mars and Venus
(D) Pluto and Venus
(E) Pluto and Mars

99. The elements in the universe have been created from _____ by _____.
(A) hydrogen and helium, the earth
(B) hydrogen and helium, the sun
(C) hydrogen and helium, stars
(D) hydrogen and carbon, stars
(E) hydrogen and oxygen, stars

100. Which of the following terms describes as a frozen mass of gas and dust with a definite orbit through the solar system?
(A) A moon
(B) A comet
(C) An asteroid
(D) A meteorite
(E) A nebula

101. Which of the following statements is NOT true regarding black holes?
(A) Light escapes at the other end.
(B) Light cannot escape the gravity of a black hole.
(C) Black holes exert the same force on something far away as something with the same mass.
(D) Black holes swallow matter around them.
(E) Black holes are the evolutionary end points of stars with 10–15 times the mass of the sun.

102. The reaction that occurs in the sun's core is
(A) $He^4 \rightarrow 4H^1 + \text{energy}$
(B) $4H^1 \rightarrow e^4 + \text{energy}$
(C) $He^4 + He^4 \rightarrow Be^8 + \text{energy}$
(D) $Be^8 + He^4 \rightarrow C^{12} + \text{energy}$
(E) $O^{16} + He^4 \rightarrow Ne^{20} + \text{energy}$

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103. Which of the following colors of light has the shortest wavelength?
(A) Red
(B) Violet
(C) Green
(D) Orange
(E) Blue

104. Waves have an associated frequency and wavelength. The product of the wavelength and frequency is equal to a constant. The relationship between wavelength and frequency is best described as
(A) squared
(B) logarithmic
(C) inverse
(D) exponential
(E) additive

105. As a train approaches a railway station, the people waiting will hear the squeal of the train tracks before they here the train. The reason for this is
(A) the speed of sound in steel is greater than the speed of sound in air
(B) the speed of sound is constant
(C) the sound is dissipated in the air but not along the steel tracks
(D) the rails are better conductors of electricity
(E) the effect is not real

106. When a magnet is cut in half, all of the following are true except
(A) There are two magnetic poles
(B) There is only one magnetic pole
(C) The lines of the magnetic field form closed lines
(D) The magnetic field arises from moving charges
(E) The direction of the magnetic force does not change

107. The sky appears blue because
(A) the particles in the atmosphere scatter longer wavelengths of light
(B) the particles in the atmosphere scatter the shorter wavelengths of light to a larger degree
(C) red light is absorbed
(D) blue light is absorbed
(E) the sun emits electromagnetic radiation that contains a higher percentage of blue wavelength light

108. Most of the earth's oxygen is produced by
(A) coniferous forests
(B) tropical rain forests
(C) tundra
(D) taiga
(E) deserts

109. Almost all of the earth's weather occurs in the
(A) thermosphere
(B) mesosphere
(C) troposphere
(D) stratosphere
(E) exosphere

110. The most abundant component of the earth's atmosphere is
(A) oxygen
(B) nitrogen
(C) argon
(D) water
(E) ozone

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111. The burning of fossil fuels is thought to increase the possibility of global warming. When fossil fuels undergo a combustion reaction the by-products are carbon dioxide and water. Carbon dioxide contributes to the greenhouse effect by which of the following mechanisms?
(A) Carbon dioxide absorbs short wavelengths and allows infrared radiation to escape.
(B) Carbon dioxide absorbs infrared wavelengths and allows other wavelengths to escape.
(C) All wavelengths of electromagnetic radiation are absorbed by carbon dioxide.
(D) Carbon dioxide increases the temperature of the ocean.
(E) Carbon dioxide does not have any effect.

112. Which of the following phenomena is NOT caused by the movement of the plates on the earth's upper mantle?
(A) Earthquakes
(B) Volcanic activity
(C) Production of new crust along with destruction of old crust
(D) Erosion
(E) Formation of mountains

113. Two hundred and fifty million years ago, which of the following continent(s) existed?
(A) Laurasia
(B) Gondwanaland
(C) Pangea
(D) Panthalassa
(E) The current continents

114. The earth is not a sphere, rather it is an ellipsoid; it is flatter at the poles and bulges at the equator. This is a result of
(A) the pull of the moon being stronger at the equator than at the poles
(B) the pull of the sun being stronger at the equator than at the poles
(C) how the continents have drifted
(D) warmer temperatures at the equator
(E) centripetal forces resulting from the earth's rotation about its axis

115. The earth's early atmosphere is thought to have been composed of mostly carbon dioxide with less than a percent of molecular oxygen present. Life first evolved in this atmosphere. Where did the molecular oxygen in Earth's atmosphere come from?
(A) Hydrolysis of water
(B) Photosynthesis
(C) Cellular respiration
(D) Lightning strikes
(E) Nuclear reactions

116. Depletion of the ozone layer is of concern because ozone
(A) deflects infrared radiation from the sun
(B) helps maintain the molecular oxygen content of the earth
(C) is involved in the water cycle
(D) absorbs 99% of ultraviolet radiation emitted by the sun
(E) absorbs 99% of all radiation emitted by the sun

117. The thin layer which floats on top of the earth's mantle is the
(A) asthenosphere
(B) outer core
(C) hydrosphere
(D) crust
(E) atmosphere

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118. The movement of two tectonic plates away from each other results in
(A) mountain formation
(B) recycling of oceanic crust
(C) formation of new oceanic crust
(D) trench formation
(E) an earthquake

119. Bio-organic farmers add compost to the soil to replace lost nutrients. This practice is superior to the use of chemical fertilizers because
(A) there is more leaching of the nutrients from the soil into ground water
(B) there is less leaching of nutrients from the soil into ground water
(C) it is economically advantageous to use organic matter
(D) it takes less time
(E) there is no difference in the methods except the politics behind them

120. Which of the following materials is formed by the solidification of magma?
(A) Minerals
(B) Igneous rock
(C) Sedimentary rock
(D) Metamorphic rock
(E) Diamond

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