PART A: PRACTICE TEST ONE QUESTIONS 1-44

Directions (1-44): Each question is followed by four choices. Decide which choice is the best answer.

1. What is the basic unit of structure and function in plants and animals?
   1. cell  
   2. tissue  
   3. organ  
   4. system

2. Photosynthesis is the process by which
   1. chemical energy is converted into light energy  
   2. light energy is converted into chemical energy  
   3. light energy is converted into nuclear energy  
   4. nuclear energy is converted into light energy

3. When most foods are digested completely they can
   1. easily pass through cell membranes  
   2. contain long chains of fats  
   3. be considered to be gasses  
   4. be found in the stomach

4. Which system transports hormones and nutrients?
   1. circulatory  
   2. digestive  
   3. immune  
   4. respiratory

5. What is the process of producing genetically identical plants from the cells of a single plant called?
   1. cloning  
   2. fission  
   3. graphing  
   4. sexual reproduction

6. Which cell process is illustrated at the right?
   1. sexual reproduction in a plant cell  
   2. asexual reproduction in a plant cell  
   3. sexual reproduction in an animal cell  
   4. asexual reproduction in an animal cell

7. In the process of evolution, the effect of the environment is to
   1. prevent mutations  
   2. select for variations  
   3. provide conditions so that fossils form  
   4. provide stable conditions

8. Skeletal similarities between two different types of animals are probably due to the fact that both
   1. live in the same environment  
   2. perform the same function  
   3. are related to a common ancestor  
   4. have survived until the present time

9. Asexual reproduction differs from sexual reproduction in that, in asexual reproduction
   1. new organisms are usually genetically identical to the parent  
   2. reproduction includes the formation of sex cells  
   3. two cells join together  
   4. offspring show great genetic differences

10. A plant with 12 chromosomes undergoes normal cell division. What is the total number of chromosomes in each of the resulting daughter cells?
   (1) 4  (2) 8  (3) 12  (4) 24

11. What type of organism is not shown in the following food chain?
    Grass → Mouse → Snake → Hawk
   1. producer  
   2. decomposer  
   3. carnivore  
   4. herbivore
Base your answers to questions 12 through 14 on the diagram at the right.

12 Which two organisms are classified as producers?
   1. elk and rabbit
   2. shrubs and grasses
   3. grass and field mouse
   4. rabbit and shrubs

13 Carnivores are represented by the
   1. mountain lion and hawk
   2. snake and rabbit
   3. rabbit and field mouse
   4. trees and grasses

14 Consumers are represented by the
   1. trees and snake
   2. trees and rabbit
   3. mountain lion and elk
   4. shrubs and trees

15 In a particular area, the living organisms and nonliving environment function together as
   1. a population
   2. a community
   3. an ecosystem
   4. a species

16 The diagram at the right represents a wet mount of a specimen seen under a microscope. If the specimen swims toward the left side of the slide, which diagram represents the image that will be observed through the microscope?

   (1)  
   (2)  
   (3)  
   (4)  

17 Which part of the microscope should be used with the low-power objective, but not the high power objective?
   1. coarse adjustment
   2. fine adjustment
   3. diaphragm
   4. mirror

18 According to the diagram at the right, the if a student was looking through the high power lens of this microscope with an eyepiece that was 10 x, the total magnification would be
   (1) 10 x
   (2) 40 x
   (3) 100 x
   (4) 400 x

19 A microscope has four lenses labeled 4x, 10x, 43x, 97x. Which lens would provide for the largest field of vision?
   (1) 4x
   (2) 10x
   (3) 43x
   (4) 97x

20 In pea plants, the trait for smooth seeds is dominant over the trait for wrinkled seeds. When two hybrids are crossed, which results are most probable?
   (1) 75% smooth and 25% wrinkled seeds
   (2) 100% smooth seeds
   (3) 50% smooth and 50% wrinkled seeds
   (4) 100% wrinkled seeds
21 Which of the following graduated cylinders shows a volume of 16 mL?

(1) 24 cm
(2) 24 mm
(3) 34 cm
(4) 34 mm

22 What is the length of the nail in the diagram shown at the right?

(1) 24 cm
(2) 24 mm
(3) 34 cm
(4) 34 mm

23 What is the temperature of the thermometer shown?

(1) 20.5°C
(2) 25°C
(3) 26°C
(4) 26.5°C

24 Using the diagram below, in which picture will the sugar dissolve the fastest?

25 Examine the diagram of the ball and ring. Which of the following statements best describes what is happening.

1. The ring expanded.
2. The ball expanded.
3. The ring contracted.
4. The ball contracted.

26 What information should be placed above the arrow in the diagram below?

1. condensation
2. evaporation
3. heating
4. melting
27 Examine the diagram at the right.
Which statement is true about objects A and B?

1. Object A has a greater mass than object B.
2. Object B has a greater mass than object A.
3. Object A and B have the same mass.
4. Object A and B have no mass.

28 The diagram at the right shows a picture of a lever. Which statement best describes the advantage of using this lever?

1. The lever multiplies the effort force, but does not change the direction of the applied force.
2. The lever multiplies the effort force and changes the direction of the applied force.
3. The lever reduces the effort force, but does not change the direction of the applied force.
4. The lever reduces the effort forces and changes the direction of the applied force.

29 Examine the experiment with antibiotics and bacteria. What would be the dependent and independent variables in this experiment?

1. The dependent variable is the amount of antibiotic, while the independent variable is the bacterial growth.
2. The dependent variable is the bacterial growth, while the independent variable is the amount of antibiotic used.
3. The dependent variable is the cotton plug while the independent variable is the amount of antibiotic.
4. The dependent variable is the amount of time it takes to kill the bacteria, while the independent variable is the cotton plug.

30 Which of the following circuits will light the bulb?

(1) Battery
(2) Battery
(3) Battery
(4) Battery

31 What type of energy conversion is represented in the diagram at the right?

1. light to electric
2. heat to light
3. chemical to light
4. light to chemical
32 Which of the diagrams below best illustrates the transfer of heat in the enclosed box at the right?

(1) 
(2) 
(3) 
(4) 

33 The diagram at the right shows a type of energy called
1 solar
2 hydroelectric
3 geothermal
4 nuclear

34 Examine the diagram of the basketball and hoop. Which letter represents the greatest potential energy for the basketball?
1 A
2 B
3 C
4 D

35 The diagrams below represent three phases of matter. Energy transfer by convection takes place best in phase(s).

1 A and B
2 A and C
3 B and C
4 A only

36 The formation of the San Andreas fault shown in the diagram at the right was due to
1 moving water
2 weathering rocks
3 moving plates
4 volcanic activity
37 According to the map at the right showing the incidence of confirmed rabies cases in New York State, which animal is most responsible for the reported cases?
1. gray fox
2. raccoon
3. cat
4. bat

38 Examine the isobars in the map at the right. What is the barometric pressure at point B?
(1) 1008 mb
(2) 1012 mb
(3) 1016 mb
(4) 1020 mb

39 In the diagram at the right, which point is located on a weather front?
1. A
2. B
3. C
4. D

40 According to the weather map at the right, what type of weather is approaching Atlanta?
1. cold and dry
2. cold and moist
3. warm and dry
4. warm and moist
41 According to the map at the right, which air mass is characterized by dry, cold air?
1 A
2 B
3 C
4 D

42 Based on their location in the sedimentary rock diagrammed at the right, which organisms are the oldest form of life shown in the rock?
1 early horses
2 dinosaurs
3 armored fish
4 trilobites

43 According to the diagram at the right, the northern hemisphere is experiencing
1 summer
2 fall
3 winter
4 spring

44 In the diagram at the right of Earth and the Moon orbiting it, in which position would there be a full Moon?
1 A
2 B
3 C
4 D
PART B. CONSTRUCTED RESPONSE

Answer each question as thoroughly as you can.

1. Base your answers on the diagram at the right that illustrates the transport of oxygen and carbon dioxide.
   a. Why must this structure be located in the lungs? [1] ________________

   b. Why must the capillaries be so thin for this process to occur? [1] ________________

2. Base your answers to the following questions on the data table at the right.
   a. What interpretations about the deer population can be made from the general pattern of the entire 40 years? [1] ________________

   b. What reason can you give that could have caused both the increase and the decrease in deer population over the years? [1] ________________

   c. 

<table>
<thead>
<tr>
<th>Year</th>
<th>Deer Population (thousands)</th>
</tr>
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<tbody>
<tr>
<td>1900</td>
<td>3.0</td>
</tr>
<tr>
<td>1910</td>
<td>9.5</td>
</tr>
<tr>
<td>1920</td>
<td>65.0</td>
</tr>
<tr>
<td>1924</td>
<td>100.0</td>
</tr>
<tr>
<td>1926</td>
<td>40.0</td>
</tr>
<tr>
<td>1930</td>
<td>25.0</td>
</tr>
<tr>
<td>1940</td>
<td>10.0</td>
</tr>
</tbody>
</table>

3. The diagram below shows an experiment with a water plant.

   a. What is the purpose of this experiment? [1] ________________

   b. What is the purpose of set up A & B? [1] ________________

   c. What is the independent variable in this experiment? [1] ________________
4 The diagram at the right, shows internal and external forces that have shaped Earth.

Choose any two forces and explain how they have shaped the landscape of Earth. [2]

5 The diagram at the right shows two circus performers.

a What is the name of the simple machine on to which one circus performer jumped? [1]

b Apply your knowledge of the Laws of Motion to explain why the second performer was able to land on the elephant. [2]

6 Examine the diagram at the right of a tree growing on a hill. Sections of the roots have been labeled A and B.

a What is the factor that caused some of the roots to be longer? Explain.[2]

7 Examine the diagrams at the right of a spring scale pulling against a nail which has been hammered into a block of wood.

a What happened to the effort force after pencils were placed under the wood? Explain.[2]
PART C - EXTENDED CONSTRUCTED-RESPONSE

Read each question carefully and the answer the questions that follow.

1 An investigation was designed to determine the effect of temperature on the respiration of germinating seeds. The data table at the right shows the results of the investigation.

<table>
<thead>
<tr>
<th>EFFECTS OF TEMPERATURE ON RESPIRATION OF GERMINATING SEEDS</th>
<th>TOTAL OXYGEN CONSUMPTION (ML)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEMPERATURE °C</td>
<td>BEADS</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>30</td>
<td>0</td>
</tr>
</tbody>
</table>

a Label each axis. [1]

b Mark an appropriate scale on each axis. [1]

c Plot the oxygen consumption for the Peas. [1]

d Describe the effect of temperature on respiration in germinating peas. [1]

____________________________________________________________________

____________________________________________________________________

e What is a possible control for this experiment? [1]

____________________________________________________________________
Dylan and Hunter performed the experiment illustrated below for their teacher Mr. Norman.

**Amount of Fertilizer Added Daily**

<table>
<thead>
<tr>
<th>Amount of Fertilizer Added Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>0 g fertilizer</td>
</tr>
<tr>
<td>60 mL water</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>3 g fertilizer</td>
</tr>
<tr>
<td>60 mL water</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>6 g fertilizer</td>
</tr>
<tr>
<td>60 mL water</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>9 g fertilizer</td>
</tr>
<tr>
<td>60 mL water</td>
</tr>
</tbody>
</table>

*a* What is the purpose of their experiment? [1]

*b* Describe two types of data Dylan and Hunter would need to collect before they can come to any conclusion about their experiment. [2]

*c* Describe two sources of error that can possibly affect the outcome of their experiment. [2]
3 Examine the diagram of the falling ball.

a Describe the ball's change in potential and kinetic energy as it falls. [1]

b Describe how its potential energy changed on its second bounce, noting the percentage of change. [2]

c Explain why the ball's potential energy changed after its second bounce. [1]

4 Sarina, Alana, and Cahiriona wanted to prove to their parents, Alan and Kathleen, that if soft rock music is played while taking a test, it has no effect on how a student will perform on the test. They asked their teacher if they could use their science class for their experiment.

a Describe an experiment that they might do. Make sure to identify the control group and experimental group. [3]

b Design a data table for collecting their data. Make sure the data table identifies the dependent and independent variables. [2]