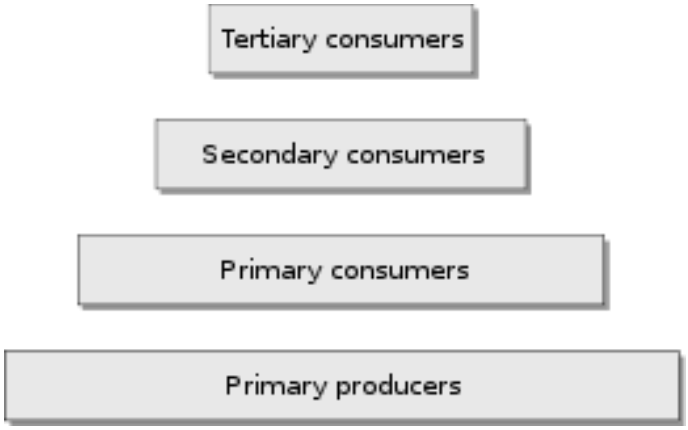
Part I : Each multiple choice Questions (A, B, C, D, E) is worth 2 points.

1. The graph below shows the trophic level of an ecosystem.



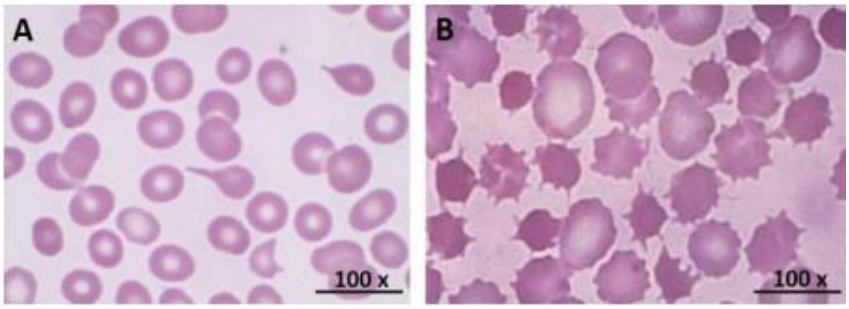
Based on the above diagram, which statement is correct?

A. Primary producers release the least energy
B. Primary and secondary consumers receive the same amount of energy
C. The higher the tropic level, the more energy they receive
D. Tertiary consumers have the least energy
E. Primary producers transfer less energy than primary consumers

2. A patient has just turned fifteen and he had sudden weight loss, increased thirst, and frequent urination. A doctor diagnosed that he has type I diabetes. What characterizes type I diabetes?

A. It is not inherited.
B. It can be controlled by exercise regularly alone.
C. Risk factors such as obesity increase its frequency.
D. The beta cells of the pancreas are destroyed.
E. The alpha cells of the pancreas are no longer produce enough insulin.

3. A group of students observed red blood cells under a microscope. The following diagram shows what they observed.



Here are the results of their observation:

1) The red blood cells are plasmolised.
2) The solution outside the cells is hypotonic.
3) Water moves out of the cells.
4) The solute concentration outside the cells is higher than inside.

Which are the correct conclusions?

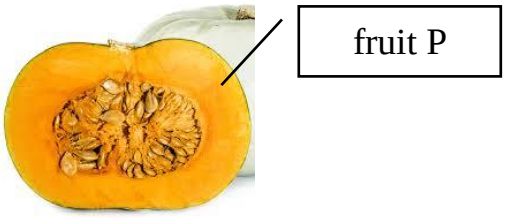
A. 1 and 2 only
B. 2 and 4 only
C. 3 and 4 only
D. 1 and 3 only
E. 2, 3, and 4 only

4. Toni has a Fahrenheit scale thermometer. Toni measures an object temperature and the result is 66°F. Toni heats the object and measures the temperature ant the result is 111°F.

What is the increasing temperature in Celcius degree?

A. 12°C
B. 20°C
C. 25°C
D. 32°C
E. All of the options are wrong.

5. Observe the picture of fruit P below.



Based on the picture, what can be concluded about fruit P?

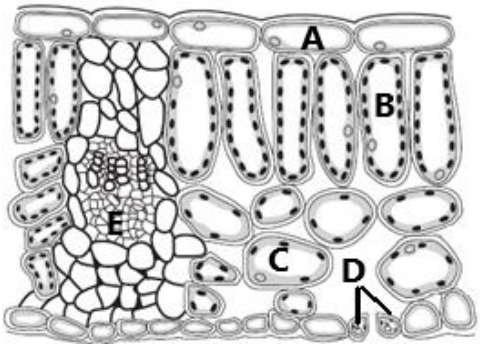
1) Its flower is pollinated by nocturnal animals.
2) It is produced from many flowers.
3) The ovary of its flower contains many ovules.
4) The fleshy part of fruit P develops from the ovary.

A. 1, 2, and 3
B. 1 and 3
C. 2 and 4
D. 1, 3, 4
E. 3 and 4

6. At a box of a lamp is written 20 W/220 V. What does it mean?

A. The lamp produces potential different 220 volts and 20 watt power.
B. Lamp consumes 20 watt power and 220 volt potential different.
C. Lamp consumes 20 watt power when connected to 220 volts electric potential difference.
D. The lamp needs 20 watts current and 220 volt potential different.
E. The lamp produces 20 watt current when connected to 220 volts electric potential difference.

7. The following diagram shows the leaf structure.



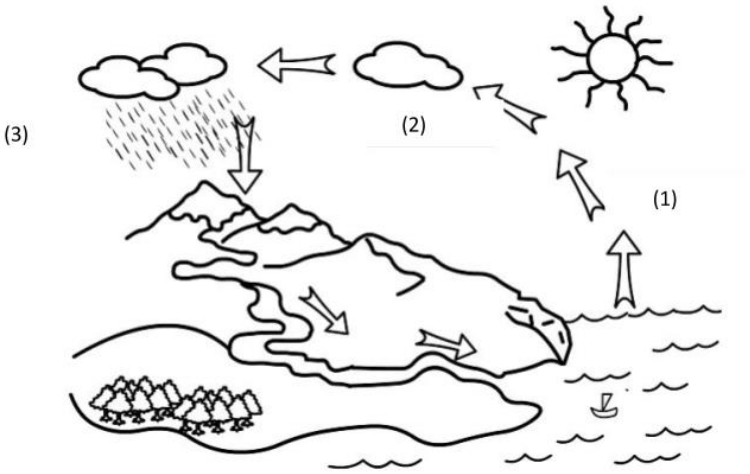
Some students stated the following information about the leaf structure.

1) A is for gas exchange.
2) B and C are the only photosynthesizing parts.
3) D opens and close stomata
4) E transports sugar

Which statements are correct?

A. 3 and 4
B. 2 and 3
C. 2 and 4
D. 2 ,3, and 4
E. 1, 2, and 3

8. There are three stages of the water cycle, pictured below.



Which of the following gives the correct label for each stage?

	(1)	(2)	(3)
A.	Transpiration	Clouds forming	Precipitation
B.	Evaporation	Condensation	Precipitation
C.	Sublimation	Precipitation	Condensation
D.	Evaporation	Precipitation	Condensation
E.	Sublimation	Clouds forming	Precipitation

9. Which of the following are things you can do to help decrease global warming?

(1) Keep your air conditioner on high

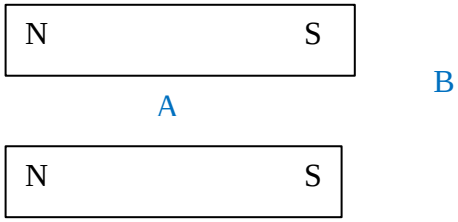
(2) Plant a tree

(3) Replace compact fluorescent light bulbs with regular bulbs

(4) Purchase low emission products and services

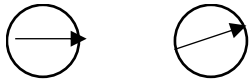
A. 1 and 2
B. 2 and 4
C. 3 and 4
D. 2 , 3 and 4
E. All of them

10. Two magnet bars are place near each other.



If two compasses are placed at A and B, how will the compasses look like?

A. 

B. 

C. 

D. 

E. 

11. What helps oxygen to be absorbed rapidly into the blood in the lungs?

A. Air breathed in has less oxygen than air breathed out.

B. Alveoli have thick walls and a large surface area.

C. Alveoli have thin walls and a large surface area.

D. The concentration of oxygen in the blood is higher than in the alveoli.

E. the concentration of oxygen in the blood is the same as in the alveoli.

12. Which statements are true about hyperopia?

1) People with this condition are difficult to see close objects clearly.

2) People with this condition are difficult to see far objects clearly.

3) The objects are focused in front of the retina.

4) The objects are focused behind the retina.

5) Concave lens is needed to correct vision.

6) Convex lens is needed to correct the vision.

A. 1, 2, 5

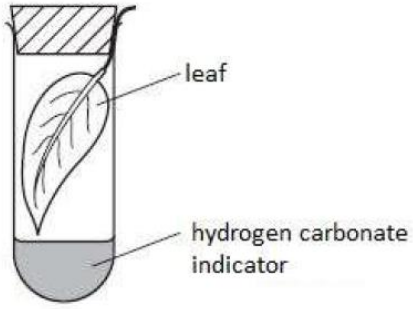
B. 3, 4, 5

C. 4, 5, 6

D. 1, 3, 4

E. 1, 4, 6

13. A green leaf is picked at time 07.00 and immediately placed in a sealed test-tube containing hydrogen carbonate indicator solution. The tube is kept near a window for 24 hours. The table shows how the indicator changes in colour.

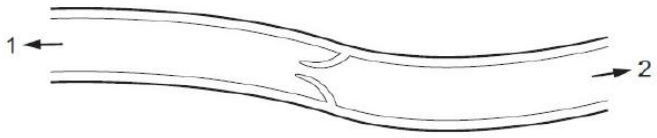


Color	amount of carbon dioxide compared to average atmospheric concentration
Purple	Less than normal
Red	Normal
Yellow	More than normal

Which colour will the hydrogen carbonate indicator be at times 12.00 and 24.00?

	At 12.00	At 24.00
A.	Red	yellow
B.	Purple	yellow
C.	Yellow	Red
D.	Yellow	purple
E.	Red	purple

14. The diagram shows a section through part of a vein.



What could be the first organs found in the directions 1 and 2 ?

	1	2
A.	brain	heart
B.	intestine	liver
C.	kidney	heart
D.	lung	heart
E.	heart	kidney

15. Sometimes we feel electric shock when touching a door knob. This phenomenon happens because...

A. Our feet collects electric charges from the carpet and the charges escape our body when we touch the door knob.

B. Door knob collects electric charge from the air then flow into our body.

C. Something is wrong with the electric circuit in the house

D. Our body collects electric charges from the food that we eat and the charges escape our body when we touch the door knob.

E. Electric charges flow from our body because of temperature difference between our body and the door knob.

Part II: Each short answer is worth 3 points.

16. The careless use of nitrogenous fertilizer near rivers and lakes can cause eutrophication. This results in the death of fish. What is the direct cause of the death of the fish?

17. At a hot day, we sometime use fan to comfort our body. How does this work?

18. The phase of the moon appears as semi-circle every ..... 18.1 ..... days. The angle between the moon and the sun at this phase is about .... 18.2 .....

19. sometimes we feel the temperature is hotter or colder than the actual temperature because of the humidity of the air, which describes the amount of ..... 19.1 ..... in the air. This happens because dry air causes our sweat .... 19.2 .... into the air faster and makes us feel colder.

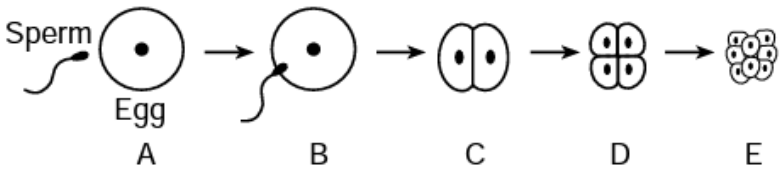
20. Two resistors connected in series dissipate ..... 20.1 ..... in total than when the two resistors connected in parallel. This happens because the current flow in each of the resistor in parallel circuit is .... 20.2 .... than the current flow in each of the resistor in series.

21. Pressure cooker is used to reduce cooking time. The pressure inside the pressure cooker is ..... 21.1 ..... than the atmospheric pressure, hence the boiling temperature water inside it is ..... 21.2 ..... than boiling temperature under atmospheric pressure.

22. Why the study of fossils is important to scientists.

23. An elevator is moving up with constant velocity, and once it is about to arrive to a chosen floor, it will slow down. During slow down, a person inside the elevator will feel his/her weight becomes ..... 23.1 ..... than his/her weight when the elevator is at rest. If the elevator wire snaps, the elevator will free-fall and the persons inside the elevator will feel his/her weight becomes ..... 23.2 .....

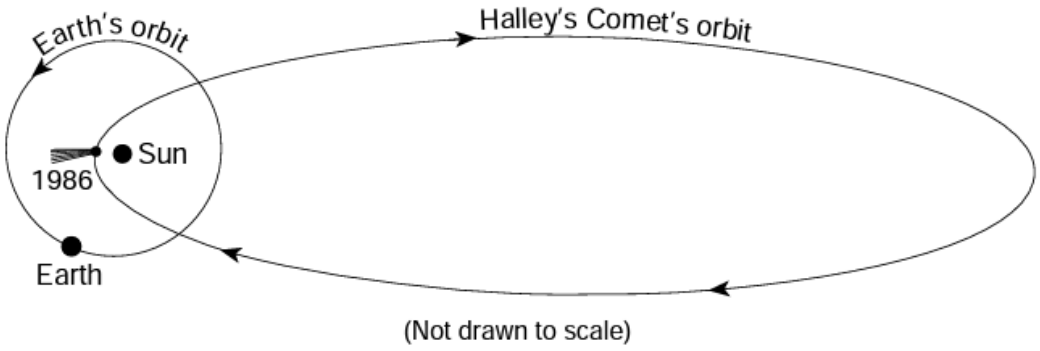
24. The diagram below represents the formation of a multicellular organism at different stages of early development. The stages are labeled A through E. The sperm and egg are labeled in stage A.



Identify the sexual reproductive process that is occurring at stage B.

25. The diagram represents the orbits of Earth and Halley's Comet around the Sun in our solar system. The position of Halley's Comet in 1986 is represented.

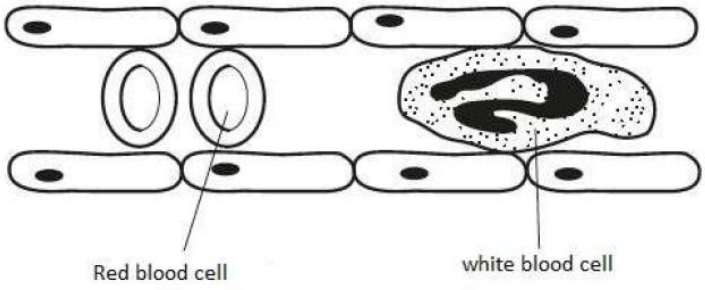
Earth and Halley's Comet Orbiting the Sun



State the number of days it takes Earth to complete one orbit around the Sun.

Part III : Essay (Total 40 points)

26. The following diagram shows a section through a blood vessel.



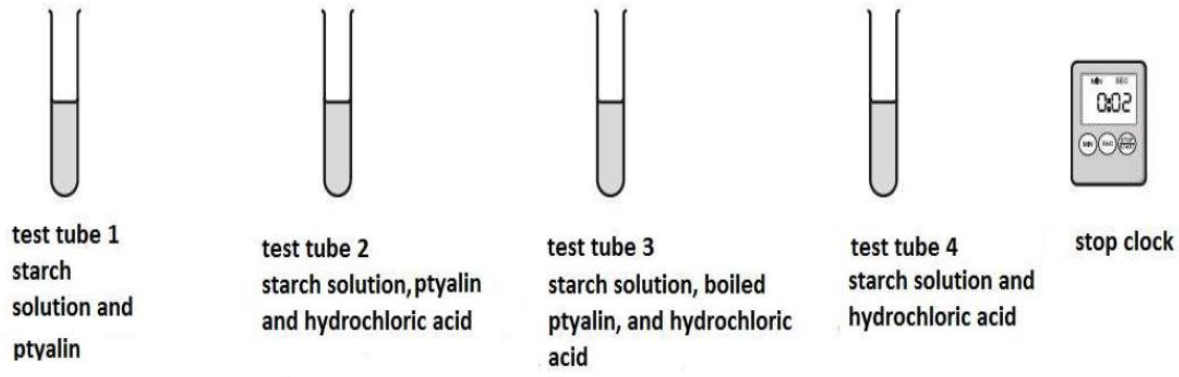
26.1 Identify the type of the above blood vessel. (1 point)

26.2 Red blood cells are different to white blood cells. State two ways in which a red blood cell is different to a white blood cell. (2 point)

26.3 State the name of the liquid component of blood. (1 point)

26.4 State three substances that are transported in the liquid component of blood. (1 point)

27. A student investigated the activity of the digestive enzyme ptyalin. The following diagram shows the apparatus used in the investigation.



After 10 minutes, each of the test-tube is added with Benedict's solution and heated.

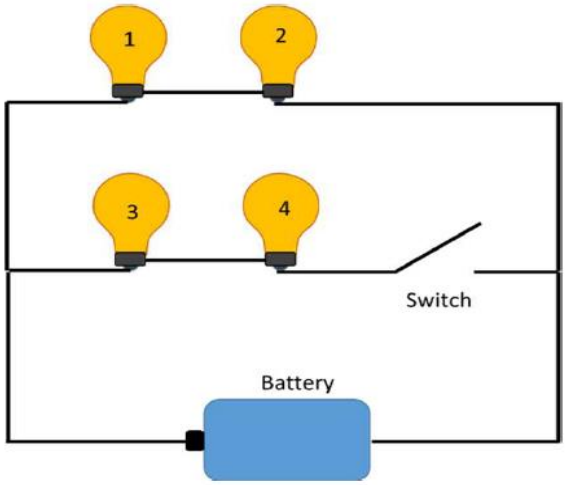
27.1 Predict which tube will change into brick-red and explain why. (3 point)

27.2 Explain the function of test-tube 4. (1 point)

27.3 State the name of part in the body that produces ptyalin. (1 point)

27.4 Maltase is another digestive enzyme. Describe the action of maltase and state where it acts in the alimentary canal. (3 point)

28. Consider the following electrical circuit with four identical light bulbs. Initially, the switch is in off position. When the switch is turned on,



28.1 Will the current through light bulb 1 increase, decrease or stay the same? Explain. (2.5 point)

28.2 Will the total current through the battery increase, decrease or stay the same? Explain. (2.5 point)

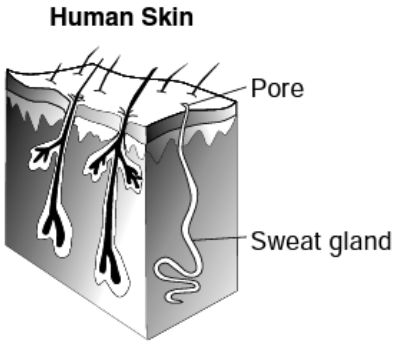
28.3 Will light bulb 1 becomes dimmer, brighter or the brightness is unchanged? Explain. (3 point)

29. Anton and Max run around a football field, which is 400 m long. After 20 minutes Anton has completed exactly 6 rounds and passed the finish line at the same time as Max. However, during the process he has overtaken Max twice before.

29.1 What is the average speed of Anton? (4 point)

29.2 What is the ratio of the average speed of Anton to the average speed of Max? (4 point)

30. The diagram below represents a magnified cross section of human skin. The skin is an organ in the human excretory system. Two structures in the skin are labeled.



Describe one way the release of sweat allows the skin to function as part of the human excretory system. (8 point)

Answer Key

Part 1 : Multiple Choice

1.	D	6.	C	11.	D
2.	D	7.	A	12.	E
3.	C	8.	B	13.	B
4.	C	9.	B	14.	E
5.	E	10.	C	15.	A

Part 2 : Short Answer

16.	Decomposers reduce the amount of dissolved oxygen in the water
17.	Fan decreases pressure near our skin and makes us feel more comfortable.
18.	18.1 **14 or 15** 18.2 **90°**
19.	19.1 **water vapor** 19.2 **to evaporate**
20.	20.1 **Less power** 20.2 **higher**
21.	21.1 **higher** 21.2 **higher**
22.	— provides evidence for the theory of evolution — indicates types of past environments — provides evidence that a great variety of species once existed — indicates past climate conditions
23.	23.1 **smaller** 23.2 **zero**
24.	fertilization.
25.	Allow 3 credit for any value from 365 days to 365.26 days or any equivalent fraction that fi ts into this range, e.g., 365 ¼.

Part 3 : Essay

26.	26.1 Artery (1 point) 26.2 ☐ Red blood cells do not have nucleus while white blood cells have nucleus. ☐ Red blood cells are biconcave while white blood cells are irregular. ☐ Red blood cells carry oxygen while white blood cells are important for immunity. (3 points) 26.3 Blood plasma (2 point) 26.4 amino acids, Protein, nutrients, antibodies, hormones, water, carbon dioxide, electrolytes (2 point)
27.	27.1 1. because ptyalin changes starch into maltose in neutral pH (around 7) (1 point) 2. maltose is a reducing sugar which becomes brick red if it reacts with Benedict's solution.(2 point) 27.2 As a control (1 point) 27.3 Salivary glands (1 point) 27.4 Maltase breaks maltose into 2 molecules of glucose, maltase is in the small intestine. (2 points)
28.	28.1 The same, because the voltage across the branch stay the same. (2 points) 28.2 Increase, because additional current flow through the switch. (2 points) 28.3 The same, because the current is the same. (2 points)

29.	29.1 400x6/(20x60)=2 m/s (3 points) 29.2 Max complete only 4 turn. So 6:4=3:2 (3 points)
30.	— Sweating is a way of getting rid of liquid waste. — removal of wastes/salt — Sweating helps remove excess heat from the body