

ข้อสอบบริการวิชาการวิชา Science  
รูปแบบการเรียนรู้ไตรภาษา

**Instruction: Select the best answer for each question.**

1. Which relationship between organisms is NOT a "mutualistic relationship"?

- A. Clownfish and coral
- B. Bee and flower
- C. Snake and Mouse
- D. Lichen and algae

2. Eric is travelling with his family at the zoo and stops at the rice paddy fields to take in the beautiful view. He observes various organisms such as rice, grass, buffalo, grasshoppers, birds, worms, snakes, field mouse, striped snakehead fish, and tadpoles.

Which organisms observed by Eric at the rice paddy are secondary consumers?

- A. Rice
- B. Buffalo
- C. Birds
- D. Worms

3. Fiber is essential for a healthy digestive system primarily because it adds bulk (or feces) and helps regulate bowel movements. Which component of the diet is most directly delayed by the lack of fiber?

- A. The initial breakdown of proteins in the stomach.
- B. The mechanical action (peristalsis) of the intestines.
- C. The absorption of water and vitamin B12 in the large intestine.
- D. The breakdown of starches by amylase in the mouth.

4. From question number 3, what could possibly happen to Alice if she still eats only meat and hardly eats vegetables in the long term?

- A. Her digestive tract will work harder because of digesting too much protein.
- B. She lost weight quickly due to eating too much protein.
- C. She could experience difficulties with her bowel movements and other digestive issues.
- D. She could have digestive problems due to chewing food insufficiently.

5. Professor Stone and Alex are studying the layers of rock near a riverbed. They find a rock containing the fossilized remains of marine shells. What type of rock is it most likely to be?

- A. Igneous rock
- B. Metamorphic rock
- C. Sedimentary rock
- D. None of above

6. Robert goes to the shopping mall and sees the food label for 4 brands of instant noodles. Robert's primary goal is to lose weight. to minimize caloric intake for weight loss, Robert eliminates all instant noodle brands that contain Lipids. Which brand is immediately disqualified based on the table?

Types of Brands	Carbohydrate	Protein	Lipid	Minerals	Vitamins
1	/	/	/	X	X
2	X	X	X	/	/
3	/	/	X	/	/
4	X	X	/	X	X

- A. Brand 1
- B. Brand 2
- C. Brand 3
- D. Brand 4

7. David previously observed that a bowling ball and a feather dropped simultaneously in a vacuum chamber reached the ground at the same time. Now, he plans to drop a water bottle and a sheet of paper from the same height in the vacuum chamber. Based on his prior observation and the laws of physics, what hypothesis should David set for this new experiment?

- A. The water bottle will reach the ground first because it has greater mass.
- B. The sheet of paper will reach the ground first because it has a greater surface area.
- C. Both the water bottle and the sheet of paper will reach the ground at the same time.
- D. The paper will float due to the absence of air pressure.

8. If Patrick wants to calculate the weight (the gravitational force) of his 2.00 kg rock on Mars, where the acceleration due to gravity is approximately 3.7 N/kg (or  $\text{m/s}^2$ ) what physical property must he use for the calculation?

- A. The rock's volume
- B. The rock's density
- C. The rock's temperature
- D. The rock's constant mass

9. A glass bottle is completely filled with water and sealed tightly, then placed into a freezer. What observation is expected after several hours, and what is the reason?

- A. The bottle remains intact because the water decreases in volume.
- B. The bottle remains intact because the freezing temperature causes the density to equalize.
- C. The bottle breaks up because the mass increases during freezing.
- D. The bottle breaks up because the freezing water expands, increasing its volume beyond the bottle's capacity.

10. A different patient suffers from hyperopia (farsightedness), where the eye's focal point is located behind the retina. Knowing that a concave lens is used for myopia, which lens type would be required to fix hyperopia, and what is its action?

- A. Concave lens, because it diverges light to move the focal point forward.
- B. Convex lens, because it converges light to move the focal point forward.
- C. Concave lens, because it focuses light on the retina by spreading rays.
- D. Convex lens, because it focuses light on the retina by diverging rays.

11. Which of the following is an example of heat transfer by 'conduction'?

- A. Water boiling in a pot.
- B. Sunlight radiating heat to Earth.
- C. Using a metal spoon to stir a hot glass (the spoon heats up).
- D. Using a metal spoon to stir a hot glass (the spoon heats up).

12. If a powerful explosion occurs in the near-perfect vacuum of deep space, what auditory effect would an astronaut floating nearby experience?

- A. A loud, delayed boom due to low density.
- B. A faint, low-frequency rumble.
- C. Complete silence, as there are no particles to transmit the vibrations.
- D. A high-pitched whistle caused by residual gas molecules.

13. James Watt discovered that a horse can do work equally to about 746 joules in 1 second. From this calculation, Watt named the unit of power horsepower (HP) to be used as a standard for measuring the power of machines. Another commonly used unit of power, especially for electrical power, is the watt (W), which can be calculated from the equation:

$$P = W/t$$

where

$P$  = power (unit: watt),

$W$  = work done (unit: joule),

$t$  = time taken (unit: second).

A steam engine is found to have a power of 2,865 watts. What is its power in horsepower?

- A. 2.0 HP
- B. 2.8 HP
- C. 3.8 HP
- D. 5.6 HP

14. A student observed changes in daily life from four different situations. The changes observed in each situation are shown in the table.

Situation	Observed Changes
A	Burning garbage in the village
B	Water seeps into tissue paper
C	Dissolution of salt in water
D	Spoilage of food

Based on the information in the table, which situation is not considered a physical change?

- A. A and C
- B. A and D
- C. B and C
- D. B and D

15. To effectively reduce global carbon emissions, which activity must be actively minimized?

- A. Increasing the planting of trees globally.
- B. Burning coal power plants.
- C. Combustion of coal and petroleum products for energy.
- D. Increasing the number of gasoline-powered cars on the road.

16. A group of students experimented with measuring the density of three types of plastic. From the table of the density of each type of plastic, what density should the student prepare for the  $\text{ZnCl}_2$  solution so that the microplastics float above the  $\text{ZnCl}_2$  solution?

Type of plastic	Density ( $\text{g/cm}^3$ )
A	1.50
B	0.50
C	2.91

- A. 1.0
- B. 1.50
- C. 0.50
- D. 2.91

17. Which of the following is not a way that matter changes phase?

- A. Melting
- B. Freezing
- C. Evaporation
- D. Mixing

18. In estimating the pH of samples A – D by adding natural indicators to the samples

Samples	Butterfly Pea pH 1 - 3 (red - purple)	Turmeric pH 6 - 7 (yellow - orange) pH 1 - 3 (orange - brown)	Butterfly Pea pH 9 - 10 (colorless - yellow)
A	purple	orange	colorless
B	purple	brown	yellow
C	red	yellow	colorless
D	purple	yellow	colorless

Arrange the sample solutions in order from most acidic to most alkaline.

- A.  $A > D > C > B$
- B.  $C > D > A > B$
- C.  $C < D < A < B$
- D.  $B < A < D < C$

19. If an object is said to have volume, which other fundamental property must it also have to be classified as matter?

- A. Shape
- B. Temperature
- C. Colour
- D. Mass

20. A mixture contains fine sugar crystals and small pieces of nickel metal. What is the most effective and direct method to separate these two components?

- A. Filtration
- B. Sieving
- C. Boiling
- D. Magnetic separation