

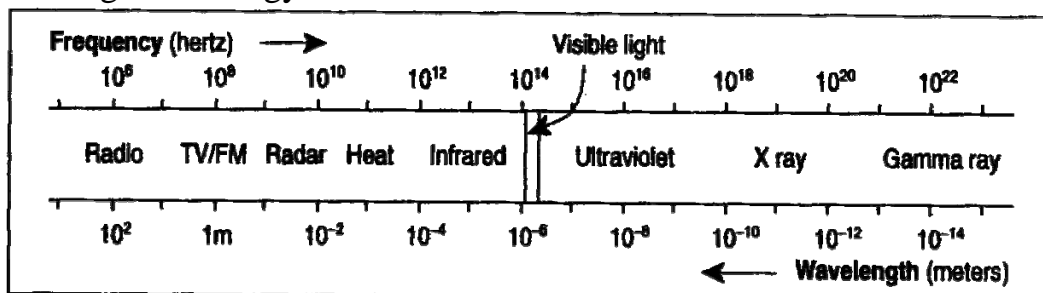
# INTERNATIONL MATHEMATICS AND SCIENCE OLYMPIAD FOR PRIMARY SCHOOLS (IMSO) 2007

## Science Contest in Taiwan

Name: \_\_\_\_\_ School: \_\_\_\_\_ Grade: \_\_\_\_\_ number: \_\_\_\_\_

**Directions** (1–30): Each question is followed by four choices. Decide which choice best completes the statement or answers the question. On the separate answer sheet, record your answers in the spaces provided by writing the same *letter* as the answer you have chosen.  
Each correct answer is worth **4 points**. Time limit: **60 minutes**.

1. Which substance provides humans with their main source of energy?  
(A) food (B) carbon dioxide (C) water (D) chlorophyll
2. The wheels and gears of a machine are greased in order to decrease  
(A) potential energy (B) efficiency (C) output (D) friction
3. Weather forecasts are more accurate today than in the past due to  
(A) global warming (B) air-quality control  
(C) plate tectonics (D) use of images from space
4. The endocrine system produces chemicals that affect organ functions. These chemicals are called  
(A) nutrients (B) hormones (C) microbes (D) wastes
5. The diagram below shows the frequency and wavelength of various types of electromagnetic energy.



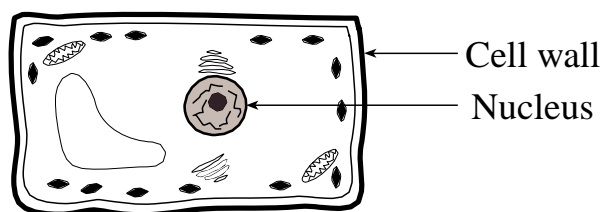
- Which type of electromagnetic wave has a wavelength of approximately  $10^{-10}$  meter and a frequency of  $10^{18}$  hertz?
- (A) infrared (B) radio (C) X ray (D) radar
6. The presence of some similar structures in all vertebrates suggests that these vertebrates  
(A) all develop at the same rate  
(B) evolved from different animals that appeared on Earth at the same time  
(C) all develop internally and rely on nutrients supplied by the mother  
(D) may have an evolutionary relationship
  7. Which part of a cell allows nutrients and other materials to enter or leave the cell?  
(A) cytoplasm (B) nucleus (C) chloroplast (D) cell membrane

**Base your answers to questions 8 and 9 on the table below, which compares human population and sulfur dioxide (SO<sub>2</sub>) levels in the atmosphere over time.**

8. How have the size of the human population and the amount of sulfur dioxide (SO<sub>2</sub>) in the atmosphere changed from 1960 to 1990?

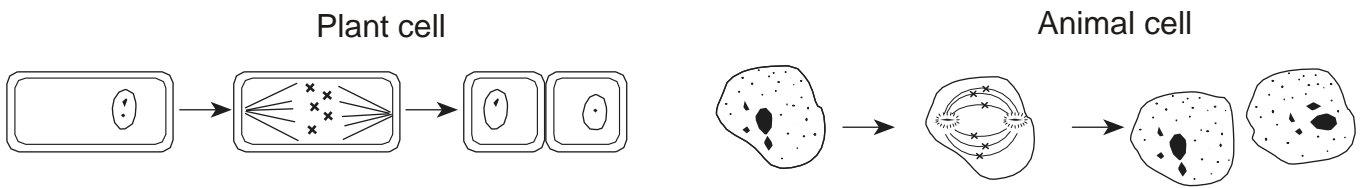
Year	Human population (billions)	Sulfur Dioxide (SO <sub>2</sub> ) Levels in the Atmosphere
1960	2.50	510
1970	2.75	525
1980	3.00	613
1990	5.00	642

- (A) The human population has increased while the amount of SO<sub>2</sub> has decreased.  
 (B) The human population has decreased while the amount of SO<sub>2</sub> has increased.  
 (C) Both the human population and the amount of SO<sub>2</sub> have increased.  
 (D) Both the human population and the amount of SO<sub>2</sub> have decreased.
9. Which human activity might explain the change in sulfur dioxide levels shown in the graph?
- (A) storing nuclear waste (B) collecting solar energy  
 (C) using wind energy (D) burning fossil fuels
10. The diagram below shows a cell.



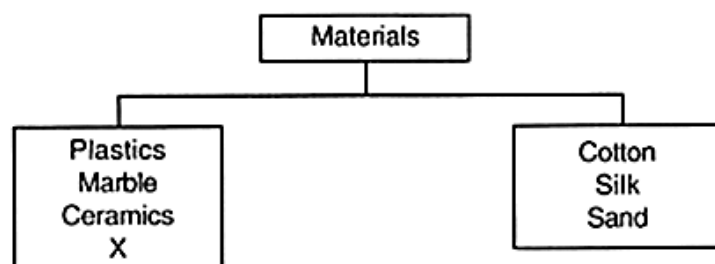
- This cell would be found in which type of organism?
- (A) animals (B) fungi (C) viruses (D) plants
11. Rocks are classified as igneous, metamorphic, or sedimentary according to
- (A) their color (B) their shape  
 (C) how they formed (D) the minerals they contain
12. Sand and iron particles that are similar in size and color are mixed together in a beaker. What would be the best method of separating the particles?
- (A) Use tweezers to separate them. (B) Use a magnet to separate them.  
 (C) Add water to the mixture. (D) Pour the mixture into a filter.
13. Nutrients, water and carbon dioxide are returned to the environment when
- (A) plants make food during photosynthesis.  
 (B) decomposers breakdown dead matter.  
 (C) organisms reproduce.  
 (D) living things respire.

14. A plant cell and an animal cell are shown below.



Which conclusion can be made from these diagrams?

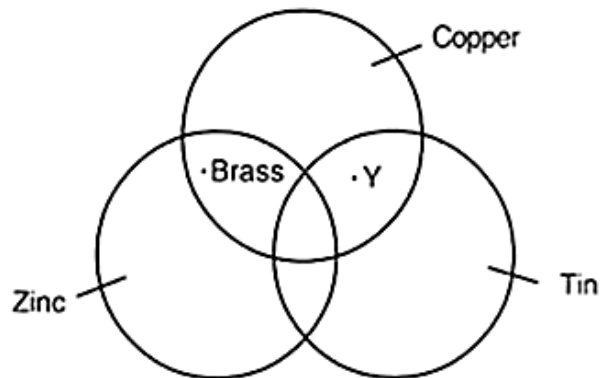
- (A) Plant and animal cells interact to make new organisms.
  - (B) Plant and animal cells are similar in the way they grow and divide.
  - (C) Animal cells require oxygen to release the energy stored in food while plant cells do not.
  - (D) Nerve cells are present in plant and animal cells.
15. In one variety of corn, the kernels turn red when exposed to sunlight. In the absence of sunlight, the kernels remain yellow. Based on this information, it can be concluded that the color of these corn kernels is due to the
- (A) process of selective breeding
  - (B) rate of photosynthesis
  - (C) effect of environment on gene expression
  - (D) composition of the soil
16. Toxins can harm a developing fetus. They usually enter the fetus by the process of
- (A) blood flow from the mother to the fetus
  - (B) active transport from the ovary
  - (C) diffusion across placental membranes
  - (D) recombination of genes from the fetus and mother
17. When you are exercising, your body gets warmer because...
- (A) Much of sweat is produced, it may cause you are feeling hot
  - (B) You are thirsty and need a lot of fresh water to drink
  - (C) Active respiration, which may cause amount of energy is discharged
  - (D) Your body makes an adaptation by improving the temperature
18. Plants are genetically modified to become resistant to unfavorable conditions. Which of the following can be examples of genetically modified plants?
- I: Plants yield more food.
  - II: Plant grow faster.
  - III: Plants are resistant to drought
  - IV: Plants are resistant to pests.
- (A) III and IV only
  - (B) I, III and IV only
  - (C) I, II and IV only
  - (D) I, II, III and IV
- 19.



Which of the following can be X?

- (A) Alloys                      (B) Rocks                      (C) Wood                      (D) Lodestones

20.



The above Venn diagram shows the materials that are mixed to form alloys. What can Y represent?

- (A) Steel                      (B) Titanium                      (C) Bronze                      (D) Aluminum

21. Arrange the distance between two bodies below in right order from the smallest to the largest

1. The Solar System – Alpha Centauri.
2. The Sun – Pluto.
3. The Earth – the Moon.
4. The Earth – the Sun.
5. The Solar System – Andromeda Galaxy.

- (A) 1-2-3-4-5                      (B) 3-4-2-1-5                      (C) 3-2-4-5-1                      (D) 3-4-2-5-1

22. A car is traveling from city A at 08:20 pm to city B with a distance of 500 km. If the speed of the car is 80 km/hour, what time will car arrive at city B.

- (A) 2:35AM                      (B) 2:45AM                      (C) 6:25AM                      (D) 6:25PM

23. Water existing as tiny droplets in clouds will fall as rain when these droplets join together. The change from clouds to falling rain is accompanied by a change in the type of energy the water has. This change is from

- (A) stored energy to movement energy                      (B) heat energy to stored energy  
(C) movement energy to heat energy                      (D) movement energy to stored energy

24. Which statement about sexual reproduction in flowering plants is correct?

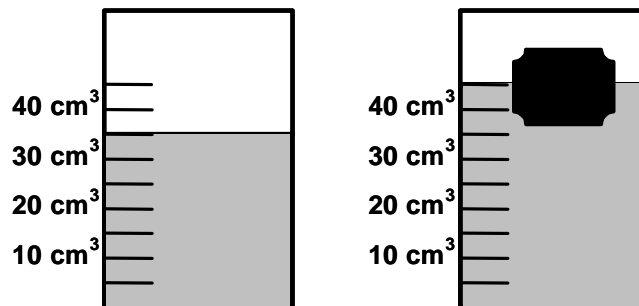
- (A) It is conducted through bud formation.  
(B) It requires the presence of petals.  
(C) It can be accomplished by grafting.  
(D) It gives rise to genetically diverse offspring.

25. Stomata in the typical green leaves,

- (A) are covered by a waxy cuticle  
(B) control the opening of guard cells  
(C) close when water is being lost at too great a rate  
(D) are usually most abundant on the upper epidermis of a leaf

26. A person can lift an object 150 kg weight on the earth and 900 kg in the Moon. What is the gravitation on the moon?  
 (A) 6/10 N/kg (B) 10/5 N/kg (C) 5/10 N/kg (D) 10/6 N/kg

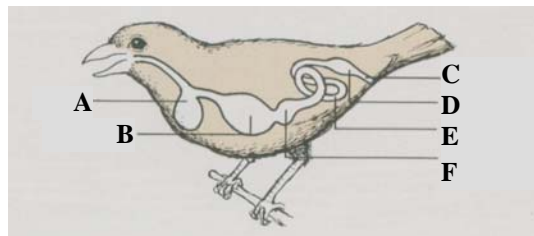
27. Figure below shows water levels in a measuring glass before and after a piece of wood of 100 g is put into the water.



Calculate the density of wood, if only half of the wood sinks into the water?

- (A) 35 g/cm<sup>3</sup> (B) 40 g/cm<sup>3</sup> (C) 5 g/cm<sup>3</sup> (D) 305 g/cm<sup>3</sup>
28. Which of the following statements are true?  
 (A) Roots always form a fibrous system that holds the soil.  
 (B) Roots possess a root cap at their tip.  
 (C) Roots form branches from lateral buds.  
 (D) Roots are commonly photosynthetic.

29. What is the name of an organ indicated by letter A in the following picture?



- (A) Crop (B) Stomach (C) Intestine (D) Cloacae
30. Which statement below describes the green-house effect?  
 (A) Buildings made of glass reflect sunlight to our environment (atmosphere) and then increase the environment temperature.  
 (B) We live in green-house like environment, the sunlight radiated to the earth surface, but the heat energy will be reflected back to the earth by CO<sub>2</sub> layer in atmosphere.  
 (C) Glass is a bad material to absorb heat energy, thus it increases the atmosphere temperature.  
 (D) Both of CO<sub>2</sub> and ozone layers in atmosphere have broken in the atmosphere, so that no barrier for sunlight. Therefore, the air temperature is increasing.