



## 3<sup>rd</sup> NATURAL SCIENCE OLYMPIAD

GRADE 4 TO 6

08 MAY 2013

09:00 - 12:00

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### INSTRUCTIONS

Please read the instructions carefully before answering the questions

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This is a multiple choice paper. Please answer all the questions on the answer sheet provided. Each question is followed by answers marked A, B, and C. **Only one answer is correct.** Choose the most correct answer and shade the corresponding circle on the answer sheet completely using an HB pencil.

**NB!** The answer sheets are marked electronically – do not make any other dots or marks on the answer sheet. Select only one answer for each question or your answer will be discarded. **Ensure that you shade your selection clearly.**

Note that the question numbers 1 – 100 on the answer sheet moves from top to bottom in several columns. Ensure that the number of your selection on the answer sheet corresponds with the number of the question in your examination paper. Should you make a mistake, please erase the incorrect answer completely.

The use of **non-programmable** electronic calculators is permitted.

**To Avoid Disqualification** - You are required to complete **all** the information requested on the answer sheet. Please complete the information in script as well as shade the corresponding blocks. If the corresponding blocks are not shaded appropriately, your results will be returned without a name and you will be disqualified. The student number allocated to you can be obtained from your teacher and consists of eight digits e.g. 08149701

Do not fold the answer sheets.

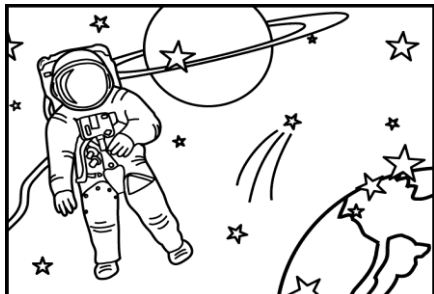
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Three hours are allowed to answer the questions

# Natural Science Olympiad 2013

## Grade 4 to 6

1. Human space travellers work and stay in space stations for long periods, these travellers are known as .....



- A. astronauts
- B. cosmonauts
- C. astronauts and cosmonauts

2. Devices that orbit the Earth and are used to transmit information about the Earth, like climate changes, TV signals, and communication networks are called ...

- A. Satellites
- B. Meteors
- C. Asteroids

3. In 2012, a major news feature in South Africa was the SKA project. A large part of this massive radio telescope will be built in the Karoo. It may one day assist man to determine the origin of the universe. What does the anagram/abbreviation SKA stand for?

- A. Science Kilometre Array
- B. Square Kilometre Array
- C. Square Kilogram Array

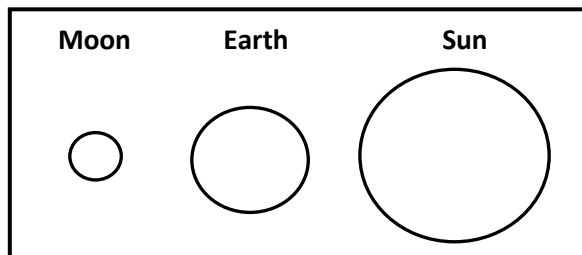
4. What name is given to the science which studies the atmosphere?

- A. Atmospherology
- B. Meteorology
- C. Weatherology

5. The apparent daily path of the Sun changes with the seasons because:

- A. Earth's axis is tilted.
- B. Earth's distance from the Sun changes.
- C. The Sun revolves.

6. Use this diagram to answer the next question.



What phase of the moon would you see on this night?

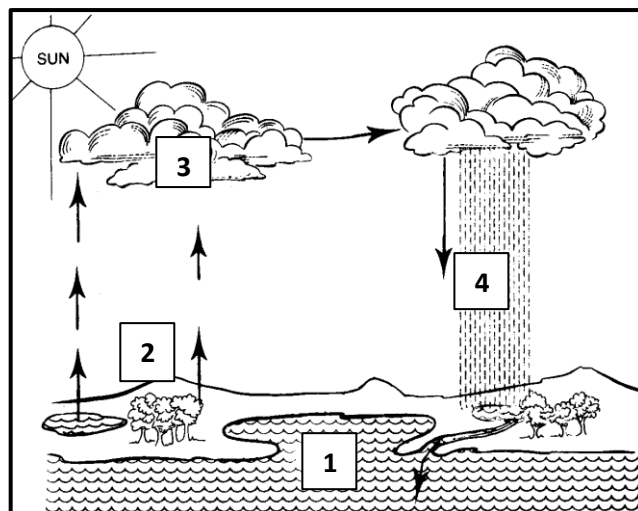
- A. half moon
- B. new moon
- C. full moon

7. Which rock has the following characteristics?

|   |  |
|---|--|
| 1 | It forms when magma cools and solidifies.                    |
| 2 | Can be formed from lava brought to the surface of the Earth. |
| 3 | Blown to the surface of the Earth in a volcanic explosion.   |

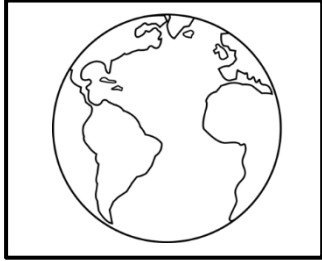
- A. Igneous rock
- B. Sedimentary rock
- C. Metamorphic rock

8. Look at the picture of the Water Cycle below. What process takes place at Number 4 in the picture?



- A. Evaporation
- B. Condensation
- C. Precipitation

9. What is the diameter of the Earth?

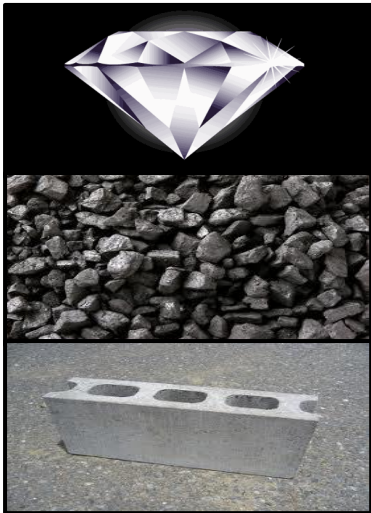


- A. The equatorial diameter of the Earth is 15,000 kilometres
- B. The equatorial diameter of the Earth is 10,500 kilometres
- C. The equatorial diameter of the Earth is 12,756 kilometres

10. How much of the earth's fresh water is frozen?

- A. 25%
- B. 61%
- C. 75%

11. What is the hardest substance known?



- A. Concrete
- B. Coal
- C. Diamond

12. The universal force that tries to press us towards the centre of the Earth is called:

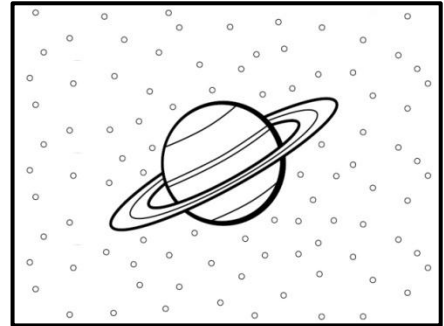
- A. Density
- B. Gravity

C. Weight

13. What is a sign of life on a planet?

- A. Water
- B. Light
- C. Wind

14. Which planet is famous for the beautiful rings that surround it?



- A. Venus
- B. Pluto
- C. Saturn

15. Earth is located in which one of the following galaxies?

- A. Andromeda
- B. Whirlpool
- C. Milky way

16. Why does the Moon shine?

- A. Light of the Sun shining on the Moon's surface.
- B. Release of light
- C. Light from stars

17. What is the object in the centre of our solar system?

- A. The Sun
- B. The Moon
- C. The Earth

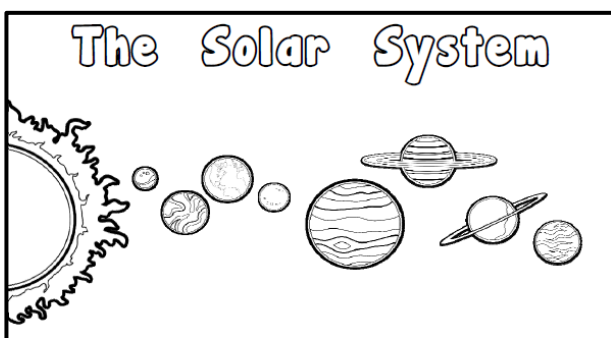
18. Which of the following planets is the biggest?

- A. Earth
- B. Jupiter
- C. Venus

19. What is a piece of rock passing through space called?
- A. A flying saucer
  - B. A spaceship
  - C. A meteor

20. Who was the first man to walk on the Moon?
- A. Mark Shuttleworth
  - B. Sir Isaac Newton
  - C. Neil Armstrong

21. Is the Earth the fourth planet from the sun?



- A. True
- B. False
- C. None of the above

22. How fast does light travel through space in kilometres per second?
- A. 300 000
  - B. 400 000
  - C. 560 000

23. How many planets are in our solar system?
- A. 11
  - B. 8
  - C. 7

24. What is a comet?
- A. Object that orbits the Sun
  - B. Object that orbits the Moon
  - C. Object that orbits the Earth

25. What are stars made up off?
- A. Liquid
  - B. Solid matter
  - C. Gas

26. What is a basic use of satellites?
- A. View the Earth's geology
  - B. Transport people
  - C. Defence against Sun's heat

27. The Moon has an atmosphere.
- A. True
  - B. False
  - C. None of the above

28. When a solar eclipse occurs, the Moon pass between the Sun and the Earth.
- A. True
  - B. False
  - C. Partly true

29. What does the abbreviation NASA stand for.....?
- A. National Administrator for Science Advancement
  - B. National Astronomy and Space Administration
  - C. National Aeronautics and Space Administration

30. During a solar eclipse the Sun is blocked out by ...
- A. Mars
  - B. The Earth
  - C. The Moon

31. What is the name of the lowest layer of the Earth's atmosphere?
- A. Lithosphere
  - B. Thermosphere
  - C. Mesosphere

32. To continue living, the human body's cells need food, water, chemicals and ....
- A. Helium
  - B. Vegetation
  - C. Oxygen

33. Oxygen moves from the lungs into the bloodstream through ...
- A. a large artery in the heart.

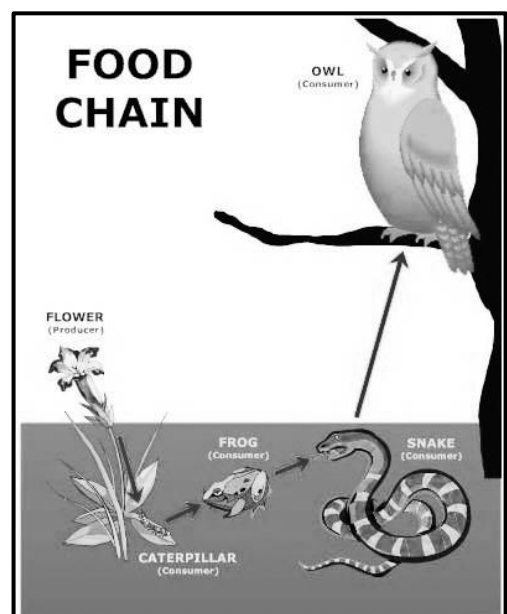
- B. small blood vessels in the alveoli.  
C. a tube in the lungs called the jugular vein.
34. What is your normal body temperature?
- A. 36 °C  
B. 38 °C  
C. 37 °C
35. What do the white blood cells in your body do?
- A. Carry oxygen  
B. Fight infection  
C. Carry food around the body
36. Genes store information about your body like a hard disc in your computer.
- A. True  
B. False  
C. None of the above
37. Your sense of taste is based on your tongue.  
Which part of your tongue detects sweet tastes?
- A. Tip of tongue  
B. Sides of tongue  
C. All of the tongue
38. What gas do leaves give off during the day?
- A. Nitrogen  
B. Oxygen  
C. Carbon dioxide
39. What is the substance called that makes leaves green?
- A. Nutrients  
B. Chlorophyll  
C. Greenleaf
40. Every year we have a special tree day in South Africa. What is this day called?
- A. Tree day  
B. Planters' day  
C. Arbor day
41. Which land animal has the biggest heart?
- A. Rhinoceros

- B. Giraffe  
C. Elephant

42. The main reason why scientists use microscopes is to ...
- a. provides contrast to the object so that it can be studied in detail.  
B. magnify small objects so that they can be studied in detail.  
C. provide colour to the object so that it can be studied in detail.



43. Which one of the following statements is not a safety precaution in a school laboratory?
- a. Keep flame and flammable solutions far apart.  
b. Do not eat and drink in a laboratory.  
c. Clean spills from the inside out using your right hand.
44. The picture below describes a simple food chain. Select the option that shows all the predators.

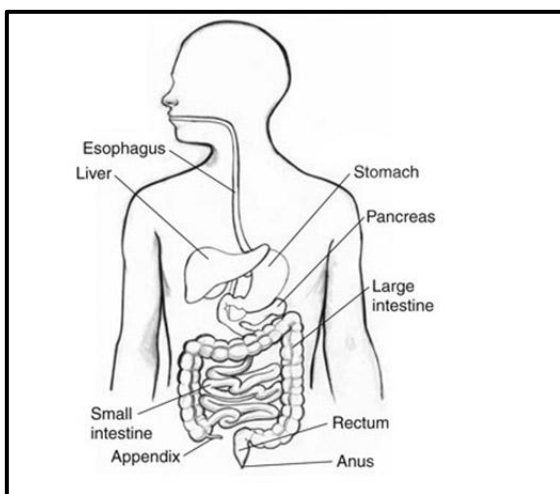


- a. Caterpillar, frog, snake and owl
- b. Frog, snake and owl
- c. Owl only

45. Refer to the food chain picture above. Select the option that shows all the prey.

- a. Caterpillar, frog and snake
- b. Flower and frog
- c. Flower and caterpillar

46. Use the diagram of the digestive system to identify the function of the liver. Select the best-suited statement below.



- A. An enzyme-producing gland that helps with the digestion of carbohydrates, fats and proteins in the small intestine.
- B. It stores and releases bile (a digestive chemical which is produced in the liver) into the small intestine.
- C. It filters toxins from the blood and makes bile (which breaks down fats) and some blood proteins.

47. The Earth's core is made of...

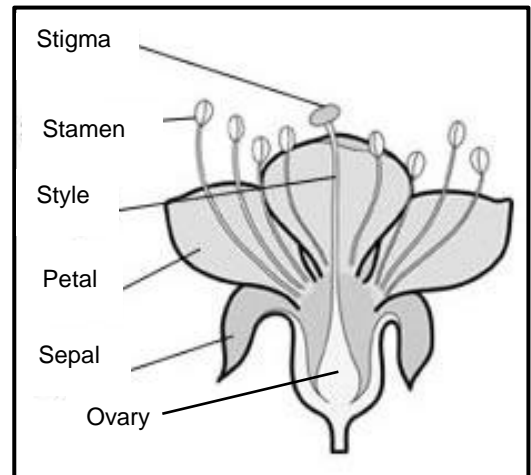
- a. Iron and nickel
- b. Soil and rocks
- c. Water and gas

48. The atmosphere consists of...

- a. 78% nitrogen, 21% oxygen, 0.9% argon, 0.03% carbon dioxide, and trace amounts of other gases.

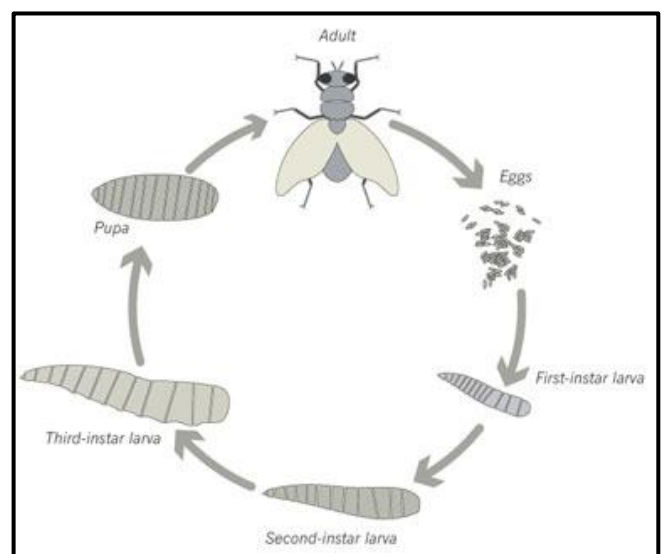
- b. 21% nitrogen, 78 % oxygen, 0.03% argon, 0.9% carbon dioxide, and trace amounts of other gases.
- c. 21% nitrogen, 78% oxygen, 0.9% argon, 0.03% carbon dioxide, and trace amounts of other gases.

49. Name the female reproductive tissue of a flower, which receives the male pollen grains during fertilization.



- A. Ovary
- B. Stigma
- C. Style

50. Provide a caption for the diagram below, from the options given below.



- a. The life span of a house fly.
- b. The life cycle of a house fly.
- c. A community of a house fly.

51. Which sense organ is responsible for balance in humans?

- a. Eyes
- b. Legs
- c. Ear

52. Which statement explains most accurately what happens when you burn your hand?

- a. The pain is felt; pain changes into electrical impulses, impulses travel to the brain for interpretation and impulse travels from brain to muscles to react to pain.
- b. The pain is felt, pain travels to the brain and pain travels from brain to muscles to react to pain.
- c. The pain is felt, pain changes into electrical impulses and impulse travels from brain to muscles to react to pain.

53. In a dark room, which part of the eye enlarges in order to see well?

- a. Retina
- b. Lens
- c. Pupil

54. The tongue is sensitive to .....

(1). bitter (2) sweet (3) heat (4) touch

- a. 1 and 2
- b. 1; 2 and 3
- c. 1; 2; 3 and 4

55. Where would you expect to find an exoskeleton?

- a. On the inside of the body of an animal
- b. On the outside of the body of an animal
- c. On the head of the animal

56. Animals like cats and rabbits have what type of skeleton?

- a. Exoskeleton
- b. Endoskeleton
- c. Inoskeleton

57. What part/s of the body is responsible for movement?

- a. Bones
- b. Muscles and cartilage
- c. Bones and muscles

58. Into which category would you place an animal with the following features?

- Lays eggs
- Cold blooded
- Vertebrate
- Has scales
- Has lungs

- a. The animal is a bird.
- b. The animal is a reptile.
- c. The animal is an amphibian.

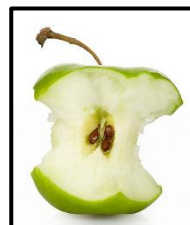
59. Into which category would you place an animal with the following features?

- Gives birth to live young
- Warm blooded
- Vertebrate
- Has hair
- Has lungs

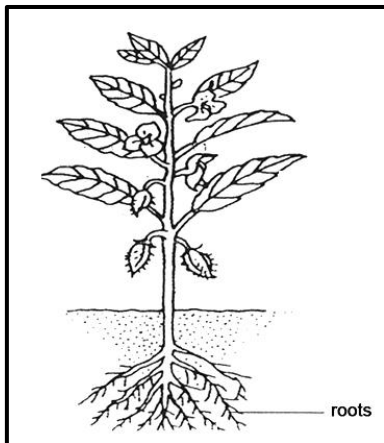
- a. The animal is a mammal.
- b. The animal is a human being only.
- c. The animal is a reptile.

60. Which item would decompose the quickest?

- |            |              |           |
|------------|--------------|-----------|
| A          | B            | C         |
| Apple core | Glass bottle | Paper bag |



61. What is the function of plant roots?

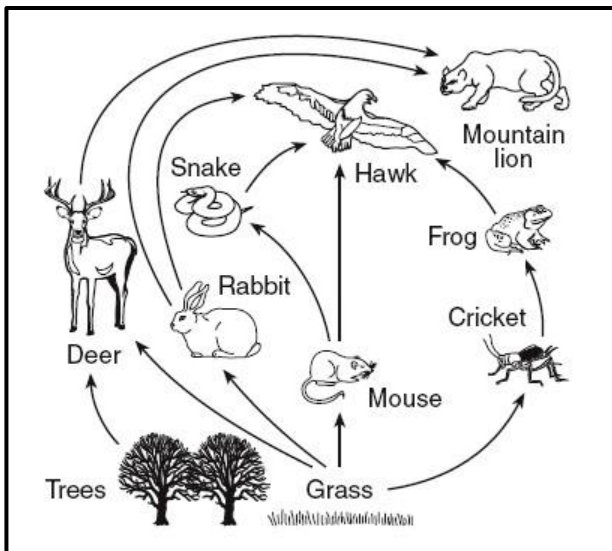


- a. Produces seeds for the plant.
- b. Part of the plant where photosynthesis occurs.
- c. Anchors the plant.

62. Bread, mealies, potatoes and sugar are classified as ....

- a. Proteins
- b. Carbohydrates
- c. Roughage

63. In the picture of the food web below, who or what are the producers?



- a. Grass and rabbit
- b. Hawk and mouse
- c. Grass and tree

64. Nutrients from food travel through the walls of the intestine to all parts of the body...

- a. in the blood through blood vessels.
- b. through the oesophagus.
- c. through the nerves connected to the digestive system.

65. A doctor will suggest one of the following plans for healthy bones.

- a. Alcohol, chocolates and sunlight
- b. Calcium, vitamin D, and sunlight
- c. Exercise, white meat and cornflakes

66. The sensation of hearing starts in the .....

- a. bones of the middle ear
- b. eardrum
- c. inner ear

67. Which one of the following diseases is caused by polluted water?

- a. Cholera
- b. Measles
- c. Influenza

68. What body structure protects the lungs from outside harm?

- a. Cartilage
- b. The rib cage
- c. The diaphragm

69. Tuberculosis (TB) is a disease of the...

- A. Kidneys
- B. Heart
- C. Lungs

70. Where was the world's first heart transplant performed?

- A. Groote Schuur Hospital in Cape Town, South Africa
- B. St Thomas's Hospital, London, England
- C. Johns Hopkins Hospital, Baltimore, US.

71. What sickness can mosquitos give a person?

- A. Tick-bite fever
- B. Flu
- C. Malaria



72. A ..... is a string instrument.

- A. Flute
- B. Guitar
- C. Clarinet

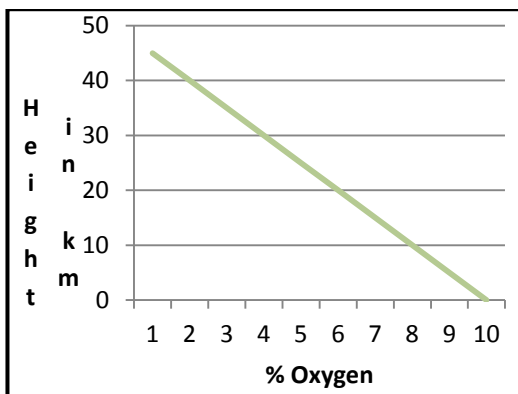
73. Why is it dangerous to heat a can of air freshener?

- A. The gas in the container contracts and the can explodes.
- B. The gas in the container expands and the can explodes.
- C. The gas in the container expands and the can implodes.

74. When would be the best time to erect telephone poles with their wires, taking into consideration safety, contraction and expansion?

- A. On a cold day
- B. On a hot day
- C. During the night

75. The graph below explains what happens when a mountaineer ascends and descends a high mountain.



Which statement is true by relating this to the graph?

- A. The higher the mountaineer climbs the more oxygen he needs.
- B. As the mountaineer climbs higher, the % oxygen decreases.
- C. As the mountaineer climbs higher, the % oxygen increases.

76. What is the result of the difference between high and low pressure systems?

- A. Rain

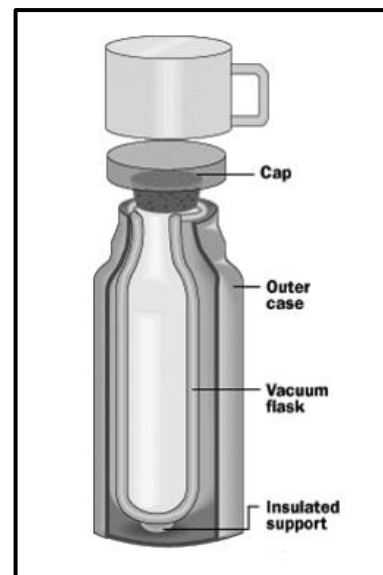
- B. Wind
- C. Lightning

77. If a beach bully poked a needle into this little girl's ball it would deflate. How would you explain this deflation?



- A. The force of gravity forces the air pressure out of the ball.
- B. The need to balance the pressure inside and outside the ball forces the air to rush out of the ball.
- C. The need to balance the low pressure inside the ball and the high pressure outside the ball causes the air to rush out of the ball.

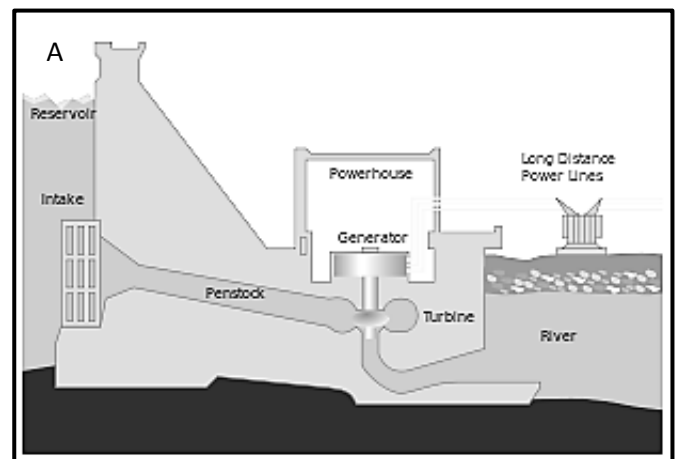
78. Which statement best explains why the content of a flask remains hot after a period?

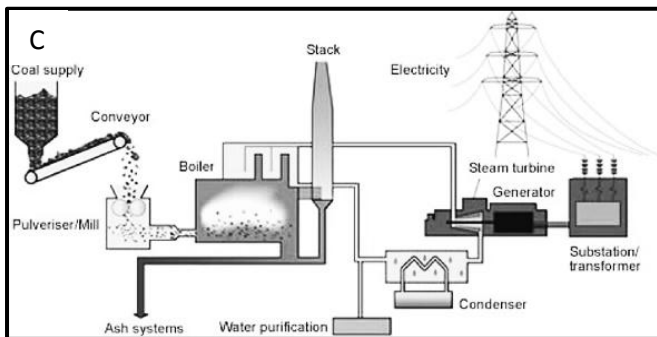
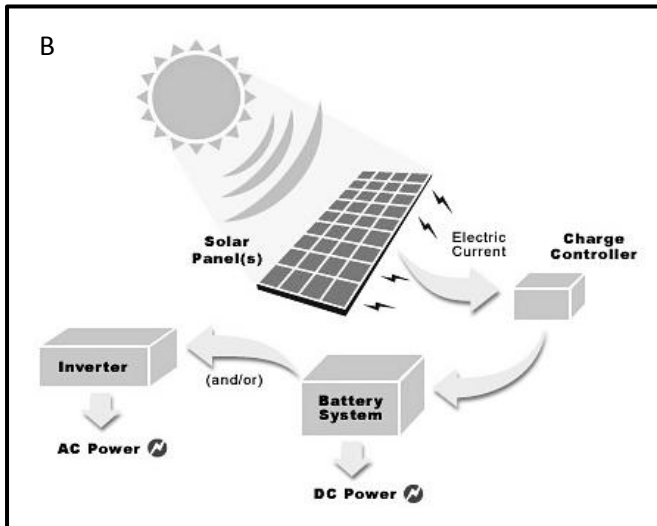


- A. The heat is trapped inside the flask and cannot escape.
- B. The cold air cannot enter the flask to cool the content of the flask.
- C. A vacuum between the two walls prevents heat escaping.

79. The basic colours used by a colour television to create the picture are:
- The seven colours of the rainbow
  - Red, blue, green and yellow
  - Red, green and blue
80. What is an alloy?
- A solid metal
  - A mixture of metals
  - A plant
81. What colour will an object be that does not reflect light?
- White
  - Black
  - Transparent
82. Which combination of factors is most suitable for the germination of seeds?
- Air, warmth, water
  - Air, soil, water
  - Water, warmth, soil
83. What is a natural form of electricity?
- Friction
  - Lightning
  - Solar energy
84. What do you call the way heat spreads through a solid or a liquid?
- Convection
  - Conduction
  - Osmosis
85. Wood is used to make paper.
- True
  - False
  - Not applicable
86. Objects have colour because they reflect or absorb the light from light sources.
- True
  - False
  - Not applicable
87. Which one of the following liquids sinks in water?
- Vegetable oil
  - Corn syrup
  - Petroleum
88. A simple device that opens and closes an electrical circuit is called a/an ...
- Resistor
  - Switch
  - Ammeter
89. The unit used for measuring electrical current is called...
- Coulomb
  - Volt
  - Ampere
90. A circuit is a path taken by electrical current. A path with no breaks is called ....
- a closed system.
  - a parallel system.
  - a series system.
91. Muscles are able to contract and relax because they get ...
- chemical energy from food.
  - heat energy from the blood.
  - electrical energy from the nerves.

Study the following pictures and answer the questions below.





92. Which of the pictures show hydropower as a system of energy?
- Picture A only
  - Picture B only
  - Picture A and B
93. Which of the pictures show a fossil fuel as a source of energy?
- Picture A and C
  - Picture B only
  - Picture C only
94. Which of the picture sets show “clean” energy sources?
- Pictures A and B
  - Pictures A only
  - Picture B only
95. Which picture shows a source of energy that causes pollution?
- Picture A only
  - Picture B only
  - Picture C only

96. In a three-pin plug, which of the following coloured wires represent the earthing wire?
- Green and yellow
  - Black
  - Brown
97. Mr Matsambo’s silver ring for his wedding 7 years ago has tarnished or lost its shininess. What do you, as a young dynamic scientist, advise him to do?
- Dip it in water for a long time
  - Dip it in soapy water
  - Dip it in lemon juice or vinegar
98. Which of the following is a chemical reaction?
- Wax melting
  - Sugar dissolving
  - Rusting
99. The burning of fossil fuels has contributed to an increase of carbon dioxide in the atmosphere. What is a possible effect that an increased amount of carbon dioxide is likely to have on our planet?
- A cooler climate
  - Damage of ozone layer
  - A warmer climate
100. An exothermic reaction is a reaction that
- Absorbs energy
  - Releases energy
  - Destroys energy

**The End**