



SOUTH AFRICAN AGENCY FOR SCIENCE AND TECHNOLOGY ADVANCEMENT
9th NATURAL SCIENCE OLYMPIAD EXAM

GRADES 7 – 9

2019

INSTRUCTIONS

Please read the instructions carefully before answering the questions

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, C, and D. **Only one answer is correct.** Choose the 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 to 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.

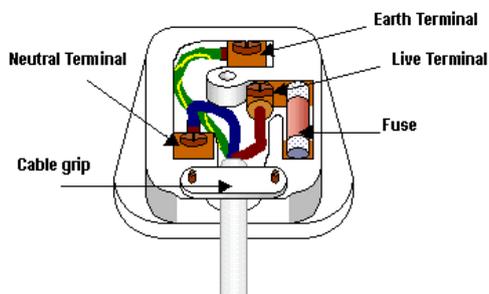
To avoid disqualification - You are required to complete **all** the information requested on the answer sheet. Please complete the information in script, as well as shade the corresponding blocks. If the corresponding blocks are not shaded appropriately, your results will be returned without a name and you will be disqualified. Do not fold the answer sheets.

Three hours are allowed to answer the questions

1. The only Nuclear Power Plant in Africa is found at

- A Abuja, Nigeria
- B Cairo, Egypt
- C Addis-Ababa, Ethiopia
- D Koeberg, South Africa

2. The diagram below shows a three pin-plug.



The purpose of the pin labelled "Earth Terminal" is to:

- A ensure that you do not get an electrical shock in case of a short circuit.
- B supply the electrical appliance with electrical power.
- C ensure you get an electrical shock if you don't put on rubber shoes.
- D increase the amount of electricity supplied to an appliance.

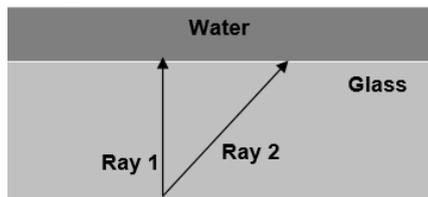
3. Which one of these is not a sexual organ from a living organism?

- A Flower
- B Penis
- C Vagina
- D Sperm

4. Which scientific classification of the domestic dog is correct? In other words, which of the following is the proper way to name the domestic dog?

- A Canis lupus Familiaris
- B Canis Lupus familiaris
- C Canis lupus familiaris
- D Familiariscanis lupus

5. Consider two light rays emanating (moving) from the glass into the water as shown in the figure below.



Which one of the following statements is CORRECT?

- A Ray 2 will not be refracted
- B Ray 1 will not be refracted
- C Ray 1 and ray 2 will be refracted away from the normal
- D Ray 1 and ray 2 will be refracted towards the normal

6. Use the data table and picture to answer this question.

Breathing Experiment

Glass	Time for candle to go out (seconds)
1	12
2	9
3	15
4	7



To model an animal breathing in an enclosed environment, Jackie lit a candle and placed a glass over the candle with the open end down. She measured how long it took for the candle flame to go out. She repeated her experiment with three other glasses, each time using the same candle. Jackie's results are shown in the data table.

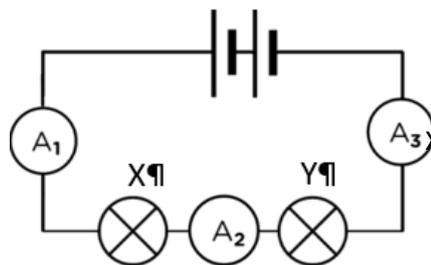
Based on the data, which statement is most likely true?

- A Glass 3 is the largest glass.
- B Glass 4 is the hottest glass.
- C Glass 1 is the coldest glass.
- D Glass 2 is the smallest glass.

7. Fracking, or hydraulic fracturing, is the process of fracturing rock by a pressurised liquid to extract natural gas from shale rock layers deep within the Earth. South Africa has a huge reserve of shale gas in the Karoo area which could benefit the economy of South Africa. Some people are opposed to possible fracking in the Karoo because it is suspected that:

- A Fracking will not create jobs.
- B Fracking will cause depopulation of the rural areas.
- C Fracking will badly affect water resources in the Karoo area.
- D Fracking might cause veld fires.

8. Consider the following electrical circuit and answer the question that follows:



The resistance of bulb X and bulb Y are 4 ohm and 8 ohm respectively. The relationship between the three ammeters A_1 , A_2 and A_3 are ...

- A $A_1 > A_2 > A_3$
- B $A_1 < A_2 < A_3$
- C $A_1 = 4A_2 = 8A_3$
- D $A_1 = A_2 = A_3$

9. What is the meaning of a reading of 3 A on an ammeter?

- A 3 Joule of energy is carried by the charges per second.
- B 3 Coulomb of charge is moving through the circuit per second.
- C Every 3 coulomb of charge carries 1 joule of energy in the circuit.
- D 1 Joule of energy is carried by every 3 coulombs of charge.

10. During photosynthesis the change in the type of energy is ...

- A chemical energy to light energy
- B light energy to radiant energy
- C light energy to chemical energy
- D light energy to heat energy

11. During respiration ...

- A growth occurs.
- B energy is needed.
- C food is produced.
- D energy is released.

12. Which of the following terms describes an animal that eats another animal in a food chain?

- A Primary consumer
- B Secondary consumer
- C Decomposer
- D Herbivore

13. Plants create their own food by absorbing and processing sunlight. The ability to produce your own food is a metabolic process called _____.

- A heterotrophy
- B autotrophy
- C homotrophy
- D self-metabolisation

14. When did John Glenn became the first American to orbit the Earth in the "Friendship 7" space capsule?

- A 1907
- B 1972
- C 1994
- D 1962

15. New substances that are formed during a chemical reaction are called ...

- A atoms.
- B products.
- C sub-atomic particles.
- D reactants.

16. Thembisa pours herself a glass of cola with ice in it. Identify which substances are solid, liquid or gas.



A GLASS OF COLA WITH ICE IN IT

- A The cola is the solid, the ice is the liquid, and the bubbles are the gas.
- B The ice is the solid, the bubbles are the liquid, and the cola is the gas.
- C The bubbles are the solid, the cola is the liquid, and the ice is the gas.
- D The ice is the solid, the cola is the liquid, and the bubbles are the gas.

17. The incomplete table below shows how organisms are classified.

Kingdom
Z
Class
Y
Family
X
Species

What do the letters X, Y and Z represent?

	X	Y	Z
A	Order	Genus	Phylum
B	Organism	Order	Phylum
C	Genus	Order	Phylum
D	Phylum	Order	Genus

18. The best place to be during a lightning storm is?



Tent



Shack



Tree

- A In a ditch in an open field.
- B Under a tall tree.
- C In a shack made of corrugated iron.
- D In a tent.

19. Which one of the following light bulbs is the most energy efficient electric light source?



LED light bulb Incandescent light bulb CFL light bulb CFL Tube

- A LED light bulb
B CFL light bulb
C Incandescent light bulb
D CFL Tube

20. An example of a STD is ...

- A AIDS.
B anorexia nervosa.
C cancer.
D bronchitis.

21. The best method to separate a mixture of sand and iron nails is...

- A Evaporation
B Distillation
C Magnetism
D Filtration

22. A student is conducting an experiment on seed germination. When the seeds germinate, which part of a plant will start to grow following the development of the radicle?

- A Leafs
B Root
C Stem
D Flower

23. A gas found in the atmosphere, that is responsible for causing global warming.

- A Ozone
B Hydrogen
C Oxygen
D Carbon dioxide

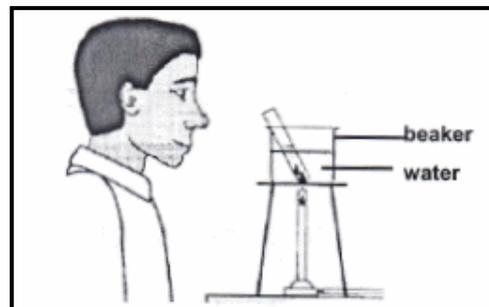
24. What is the meaning of "tinnitus", which is considered to be one of the symptoms as a result of exposure to high levels of noise?

- A A temporary loss of hearing, especially of upper frequencies
B Abdominal discomfort from low-frequency noise
C A persistent ringing or hissing in the ears
D A permanent loss of hearing

25. The reactants of photosynthesis are ...

- A carbon dioxide and water
B glucose and oxygen
C carbon dioxide and glucose
D glucose and water

26. In order to test a hypothesis, a scientist designs an experiment. He/she asks 27 learners to make observations about boiling water in a beaker. The diagram below shows one of his/her learners. Because the learners must be kept safe from harm, which statement BEST describes the mistakes in the laboratory practices shown in the diagram below?



- A The opening of the test tube points towards the learner and he is not wearing safety goggles.
B The test tube has no stopper in it and the learner is not wearing safety goggles.
C The flame is too high and the test tube has no stopper in it.
D The beaker has water in it and the flame is under the tripod.

27. Which of the following statements best explains why green marine algae are most often restricted to the top 100 meters of the water layer in the ocean?

- A The water pressure is too great for algae to survive below 100 meters.
B If the algae lived below 100 meters, it would be eaten by animals.
C Algae has no roots to anchor it to the ocean floor.
D Algae can only live in areas where it is exposed to light.

28. Two platinum electrodes are connected to a 6 V battery and immersed in distilled water. Which gas will form at the cathode of this electrolytical cell?

- A Oxygen gas.
B Hydrogen gas.
C Water vapour.
D No gas is formed.

29. The large dark areas of the moon are known as mares and are easily visible from Earth. Which of the following statements best explains the presence of these dark areas?

- A Massive volcanic eruptions, causing the formation of large volcanic craters.
B Shortly after the formation of the moon, Earth's strong gravitational pull on the moon caused the release of magma from the crust.
C Large meteors crashed into the moon and formed huge craters.
D When the moon was still semi-molten, these areas of crust collapsed due to tectonic activity, creating low areas that trapped sediments.

30. A forest is flooded when a dam breaks, leaving the forest floor under two meters of water. Which animal is most affected by the flooding?

- A a crow
- B a rabbit
- C a squirrel
- D a butterfly

31. In which situation would osmosis most likely occur in cells?

- A Through a permeable membrane that separates solutions of the same concentration.
- B Through a permeable membrane that separates solutions of different concentrations.
- C Through a non-permeable membrane that separates solutions of the same concentration.
- D Through a non-permeable membrane that separates solutions of different concentrations.

32. The solid part of Earth's surface is called the ...

- A hydrosphere.
- B lithosphere.
- C troposphere.
- D atmosphere.

33. Which one of the following is an egg-laying mammal?

- A Crocodile
- B Whale
- C Chicken
- D Platypus

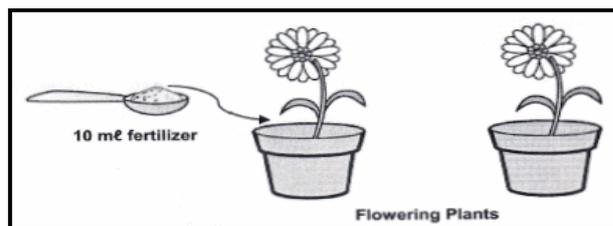
34. The salivary glands, liver and pancreas are organs associated with ...

- A excretion.
- B digestion.
- C respiration.
- D reproduction.

35. Which example describes a behavioural adaptation?

- A A bird builds its nest near a volcano.
- B When Blue whales need to eat they migrate to areas where food is abundant.
- C A fox's hair is white in the winter and brown in the summer.
- D A monkey has long arms that allow it to swing from one branch to another.

36. A learner will measure and record the growth of two flowering plants every other day for 10 days.



According to the diagram, which question is being tested?

- A How much fertilizer do flowering plants need?
- B Does fertilizer added to the soil lead to taller flowering plants?
- C Do flowering plants grow better when watered with salt water?
- D How tall do flowering plants grow?

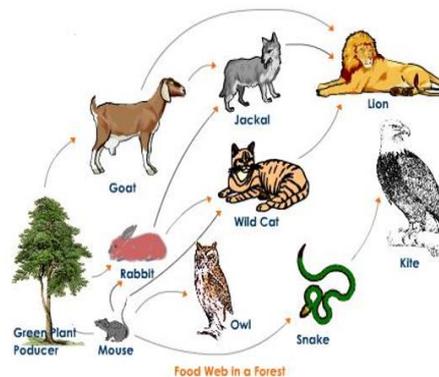
37. A girl found the skull of an animal in a field. She did not know what animal it was but she was sure that it preyed on other animals for its food. Which of the following clues could have led her to this conclusion?

- A There was a projecting ridge along the top of the skull.
- B Four of the teeth were long and pointed.
- C The eye sockets faced sideways.
- D The skull was much longer than it was wide.

38. Exhalation is the process when ...

- A muscles of the diaphragm relax, the intercostal muscles relax and air is forced out of the lungs.
- B the muscles of the diaphragm contract, the intercostal muscles contract and air is forced out of the lungs.
- C the muscles of the diaphragm relax, the intercostal muscles relax and air flows down the air passages into the lungs.
- D the muscles of the diaphragm contract and air flows down the air passages into the lungs.

39. Consider the following food web. A disease broke out that killed a large number of wild cats. Which of the responses A, B, C or D shows what happened to the populations of organisms thereafter?



	Increased	Decreased
A	Rabbits	Mice
B	Mice	Kite
C	Snakes	Mice
D	Mice	Green plants

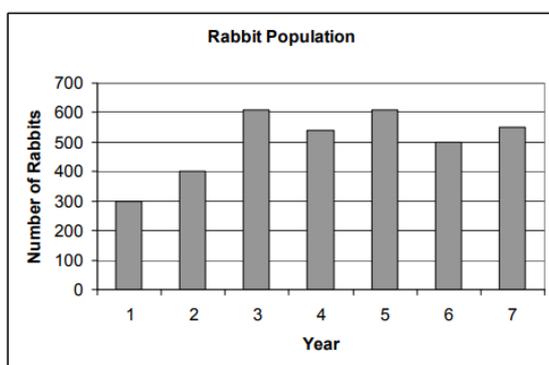
40. Volcanoes erupt when they become active. Until an eruption occurs, volcanoes are described as...

- A stagnant
- B dormant
- C extinct
- D plugged

41. Consider three types of cars; an electric car, a hybrid car, and a hydrogen fuel cell car. Which one of these cars emits a substance which does not pollute the environment?

- A An electric car
- B A hybrid car
- C A Hydrogen fuel cell car
- D Both hybrid and hydrogen fuel cell cars

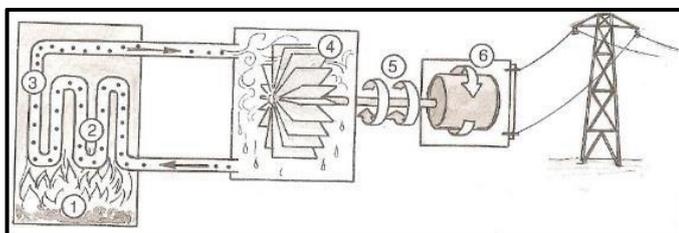
42. Use the graph below to answer the question.



The graph above shows the population of rabbits in a field over a seven-year period. Based on the data, what is the approximate carrying capacity of the field for rabbits?

- A 300
- B 400
- C 520
- D 600

43. The following diagram shows how electricity is generated at a coal-fired power station. What energy conversion takes place at stage six (6) of the power plant?



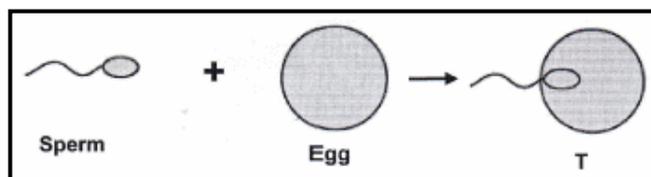
- A Heat energy into electrical energy
- B Kinetic energy into electrical energy
- C Electrical energy into potential energy
- D Electrical Energy into kinetic potential energy

44. Campers often use propane-fuelled lanterns as a source of light at campsites in the evening. As propane burns, it undergoes a change that is ...



- A chemical and exothermic.
- B physical and endothermic.
- C potential and endothermic.
- D mechanical and exothermic.

45. Which process is shown in the diagram below?



- A metamorphosis
- B ovulation
- C fertilization
- D respiration

46. A beaker contains a sodium hydroxide solution. The probe of a pH-meter is immersed in the sodium hydroxide solution. Which one of the following statements best explains how the reading on the pH meter varies as more and more hydrochloric acid is added to the sodium hydroxide solution?



- A The reading increases from 7 to around 14.
- B The reading increases from 1 to around 14.
- C The reading decreases from 13 to around 1.
- D The reading decreases from 7 to around 1.

47. Hummingbirds have this special feature:

- A They can see at night.
- B They can fly backwards.
- C They can stand on one foot for 3 hours.
- D They can swim in water for a distance of 3 km.

48. Which of the following is/are classified as Homo sapiens?

- A An ape and a boy.
- B A gorilla.
- C A boy.
- D All of the above.

49. Which system in a human body can be affected by a stroke?

- A Digestive system.
- B Circulatory system.
- C Respiratory system.
- D All of the above.

50. Which resource is most likely found in large amounts in forest ecosystems?

- A iron
- B plastic
- C wood
- D petroleum

51. Study the diagram below and answer the question that follows.

Martin shines a torch on a model of the globe. By doing so he tries to model the Sun shining on the Earth.



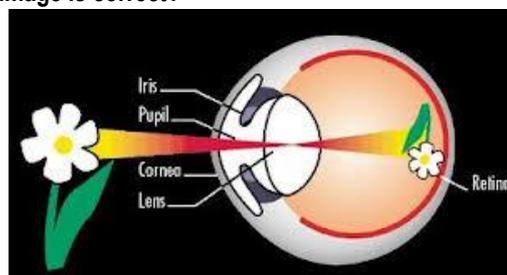
Estimate what time of day it would be on the Earth at position labelled A.

- A A = 6:00 pm
- B A = 12:00 pm
- C A = 9:00 pm
- D A = 2:00 pm

52. A house has three 100 W incandescent light bulbs and ten 20W-CFL (compact fluorescent) light bulbs that are switched on for 730 hours per month. The cost of electricity is R3.89 per kWh. Which one of the following statements is true?

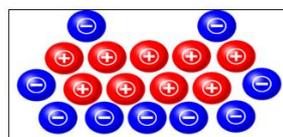
- A The monthly cost of electricity used by the ten CFL-bulbs is less than that used by the three incandescent bulbs.
- B The monthly cost of electricity used by the ten CFL-bulbs is equal to that used by the three incandescent bulbs.
- C Total energy used by all the bulbs in the house per month is 499 kWh.
- D The total cost of electricity used by all bulbs per month is R153,61.

53. The figure below shows how an image of a flower is formed on the retina of a human eye. Which one of the following statements related to the formation on the image is correct?

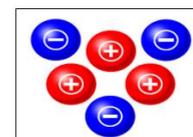


- A The flower is the source of light, the air between the flower and the eye is transparent, the cornea is transparent, the lens is transparent and the retina is opaque.
- B The flower reflects light, the air between the flower and the eye is transparent, the cornea is transparent, the lens is transparent and the retina is opaque.
- C The flower, the cornea and the retina are opaque materials.
- D The flower refracts light and the lens reflects light.

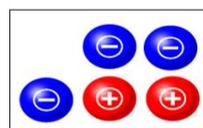
54. Consider the four charged objects in the figures below and choose the correct answer.



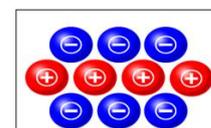
Object A



Object B



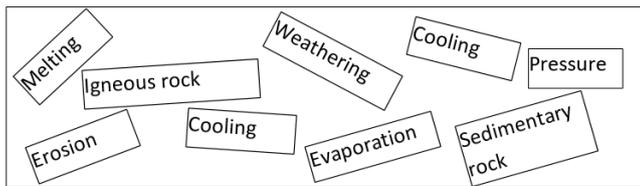
Object C



Object D

- A The total charge on object A is the same as the total charge on object D.
- B The total charge on object A is -1 and the total charge on object D is -2.
- C Object C will be repelled by object D.
- D Object B is negatively charged.

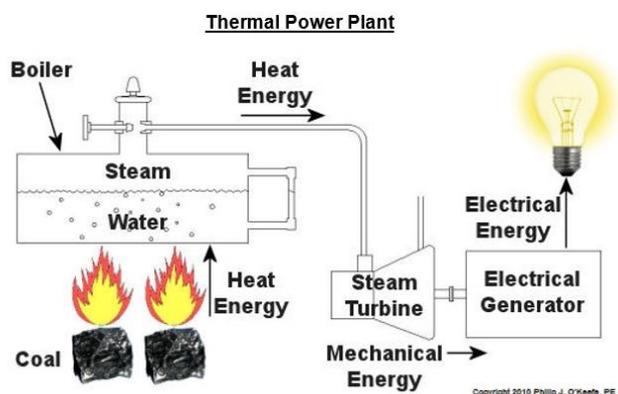
55. Consider the following word block.



Identify one word in the word block that is NOT usually associated with the Rock Cycle.

- A Erosion
- B Cooling
- C Sedimentary rock
- D Evaporation

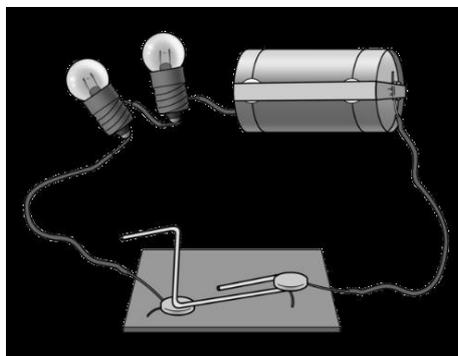
56. Consider all energy conversions taking place in the picture:



Which one of the following combinations of energy conversions is in the correct order, starting at coal?

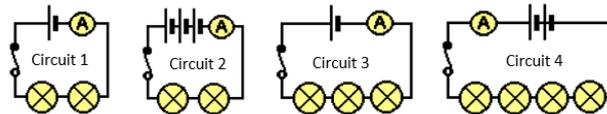
A	thermal	→	chemical	→	kinetic	→	light	→	kinetic
B	chemical	→	thermal	→	kinetic	→	electrical	→	light
C	thermal	→	kinetic	→	potential	→	electrical	→	light
D	chemical	→	thermal	→	electrical	→	light	→	heat

57. Consider the diagram below and choose the CORRECT answer from the four statements.



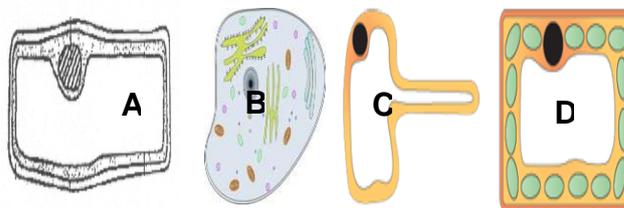
- A When the circuit is switched on the bulbs will start glowing, one after the other.
- B Each bulb will convert electric current into light.
- C Energy conversions take place in the cell and in the bulbs.
- D Each bulb will convert electric voltage into light.

58. Which of the following circuits will have the same ammeter readings? (Note that all bulbs and all cells are identical.)



- A Circuits 1 and 2.
- B Circuits 1, 3 and 4.
- C Circuits 1 and 4.
- D Circuits 2 and 3.

59. The cell diagrams below each represents a sample taken from the contents of a salad bowl containing carrots, lettuce leaves, a raw fish fillet and olive oil. Which statement below is correct?



- A A represents a cell from a carrot while B represents a cell from a lettuce leaf.
- B B represents a cell coming from a fish fillet, A represents a cell from a carrot and D represents a cell from a lettuce leaf.
- C C represents a cell coming from olive oil, D represents a cell from a carrot and A represents a cell from a fish fillet.
- D A represents a cell from a carrot, B represents a cell from the fish fillet and C represents a cell from the lettuce leaf.

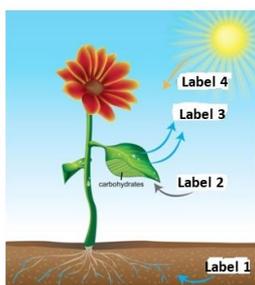
60. Scientists have observed an increase in global atmospheric temperatures over the past 100 years. Which phenomena do scientists believe contributes to the increase in temperatures?

- A An increase in undersea volcanic activity.
- B A decrease in the distance between Earth and the Sun.
- C An increase in certain gases released during the use of fossil fuels.
- D A decrease in the amount of water on Earth due to overconsumption.

61. Which one of the following statements best describes Earth's movement in relation to the Sun?

- A The sun revolves around the Earth.
- B The sun and Earth revolve around each other.
- C The Earth revolves around the sun.
- D The sun and Earth revolve around other planets.

62. The diagram below shows the process of photosynthesis. Which one of the following combinations of labels is correct?



	Label 1	Label 2	Label 3	Label 4
A	water	oxygen	carbon dioxide	light
B	carbon dioxide	oxygen	water vapour	light
C	oxygen	water	carbon dioxide	light
D	water	carbon dioxide	oxygen	light

63. Study the following chemical equations and indicate the correct balanced equation.

- A $2\text{Na} + \text{H}_2\text{O} \longrightarrow 2\text{NaOH} + \text{H}_2\text{O}$
- B $2\text{Na} + 2\text{H}_2\text{O} \longrightarrow 2\text{NaOH} + \text{H}_2$
- C $\text{Na} + 2\text{H}_2\text{O} \longrightarrow 2\text{NaOH} + \text{H}_2$
- D $2\text{Na} + \text{H}_2\text{O} \longrightarrow 2\text{NaOH} + 2\text{H}_2$

64. Which colour of light is considered the least efficient wavelength in the visible spectrum of light for the process of photosynthesis?

- A Red
B Orange
C Yellow
D Green

65. In a diagram of a food chain what do the arrows indicate?

- A Which organism eats the next organism
B The flow of energy
C The flow of biomass
D The amount of energy in the biological system

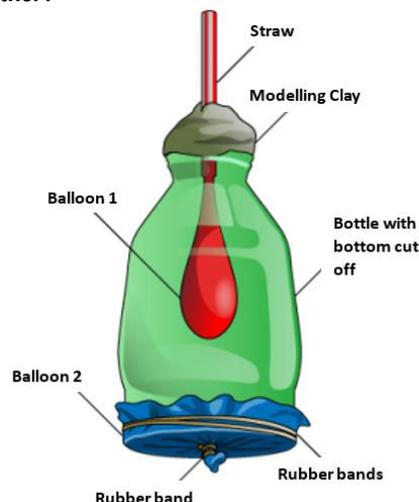
66. Which solution is used to test for the presence of starch?

- A Benedict solution
B Tollens solution
C Iodine solution
D None of the above

67. As you go down into a well, your weight:

- A increases slightly
B decreases slightly
C remains exactly the same
D None of above

68. A student made this model of the human respiratory system from a plastic soda bottle. Which sentences best explain how the model can be used to show how different parts of the respiratory system work together?



- A Balloon 1 represents the lungs and balloon 2 represents the diaphragm. Pulling balloon 2 down shows how the diaphragm causes air to enter the lungs.
- B Balloon 1 represents an alveolus and balloon 2 represents a capillary. The bottle shows that the alveolus and capillary must be close together for gases to move between them.
- C The bottle represents the lungs and the straw represents the larynx. Squeezing and letting go of the bottle shows how the lungs push air into and out of themselves.
- D The bottle represents the ribs and the straw represents the windpipe. Squeezing the bottle shows how the ribs help push air out of the lungs.

69. When a negatively charged ruler is held near a neutral ball, the ...

- A electrons in the ball move to the side further away from the ruler.
B electrons in the ruler move onto the ball and also charge it negatively.
C protons in the ball move to the side closest to the ruler.
D protons in the ball move onto the ruler and also make it neutral.

70. Adult human lungs have a surface area of around _____ square metres.

- A 5
B 30
C 45
D 70

71. In a cell or battery, _____ energy is transformed into electrical energy?.

- A mechanical
B heat
C kinetic
D chemical

72. Fehling's solution is used to test for ____

- A starch.
- B glucose.
- C protein.
- D mineral salts.

73. Natural gas is stored energy which originated from:

- A sedimentary rock.
- B a mixture of air and oil.
- C once-living plants and animals.
- D wind and water.

74. Which one of the following statements about a car travelling along a freeway is correct?

- A All chemical energy in petrol is converted to useful kinetic energy.
- B The output energy of the car is equal to the input energy.
- C Wasted energy is produced in the form of potential energy.
- D Sound energy produced by the car can be considered as wasted energy.

75. The products that are formed when an acid reacts with metal are ...

- A salt and hydrogen gas.
- B salt and water.
- C salt and carbon dioxide gas.
- D salt and oxygen gas.

76. What makes renewable energy different from non-renewable energy?

- A Renewable energy sources cannot be used over and over again.
- B Renewable energy comes from resources which are continuously replenished by nature.
- C Renewable energy cannot be replaced.
- D Renewable energy cannot be replaced by nature.

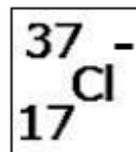
77. A certain element has the following properties:

Good conductor of electricity, ductile, malleable

Which one of the following represents the symbol of the element that best suits the description given above?

- A Br
- B Ne
- C H
- D Fe

78. Which one of the following combinations gives the correct number of sub-atomic particles and the correct charge for the ion in the block?



	Proton	Electron	Neutron	Charge
A	17	17	20	-1
B	17	18	20	-1
C	17	18	19	0
D	17	17	17	0

79. Which one of the following metals forms an amalgam with other metals and is used by dentists to produce teeth fillings?

- A Iron
- B Mercury
- C Lead
- D Zinc

80. The gas that is produced when acid reacts with a carbonate is ...

- A Carbon dioxide.
- B Oxygen.
- C Hydrogen.
- D Water vapour.

81. The total number of atoms contained in $3\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ is ...

- A 3
- B 18
- C 27
- D 63

82. Water flows through a horizontal pipe at a constant volumetric rate. At a location where the cross-sectional area decreases, the velocity of the fluid _____ and the pressure in this section of the pipe _____.

- A. increases; decreases
- B. decreases; decreases
- C. stays the same; increases
- D. increases; increases

83. Arrange according to the pH scale from the least to the most acidic.

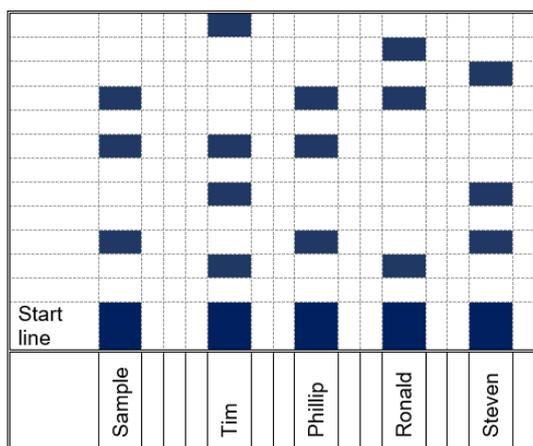
- A 6 : 4 : 2 : 1
- B 1 : 4 : 2 : 6
- C 6 : 2 : 1 : 4
- D 1 : 2 : 4 : 6

84. Which one of the following is NOT a negative consequence associated with poor waste management?

- A. Pollution of the environment
- B. Diseases
- C. Blockage of sewers and water drainage systems
- D. Soil erosion

85. The manager of NFH called their delivery company to enquire about goods that were not delivered. The manager of the delivery company claimed, a certain employee from NFH signed and received the goods. Four men were at work during the time of delivery. Their names are Tim, Phillip, Ronald and Steve. All of them, when asked about the goods, denied knowledge of them.

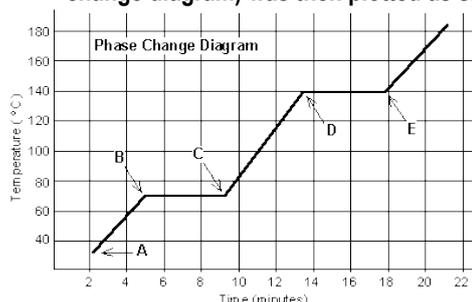
The signed document was sent to the laboratory to extract the ink pigment. At the same time pens used by the four NFH employees were seized from them and sent to the lab to be compared to the sample from the signed document. A modified chromatogram showing the result is given below.



Who amongst the gentlemen should the police pick up for questioning?

- A. Tim
- B. Phillip
- C. Ronald
- D. Steve

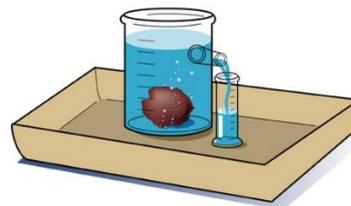
86. An unknown solid was gently heated in a container. The change in temperature was recorded for a period of 22 minutes. A graph of temperature against time (phase change diagram) was then plotted as shown below:



Which state(s) of matter was(were) present in the container after 6 minutes of heating?

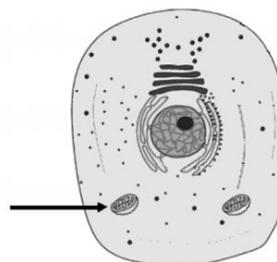
- A. Solid
- B. Solid and gas
- C. Liquid
- D. Solid and liquid

87. The apparatus below can be used to...



- A. measure the volume of a regular shaped, insoluble solid.
- B. measure the solubility of any object.
- C. measure the volume of an irregular shaped, insoluble solid.
- D. measure how much water is absorbed by the solid immersed in water.

88. Make use of the diagram and answer the question that follows.



What is the main purpose of the mitochondria indicated by the arrow?

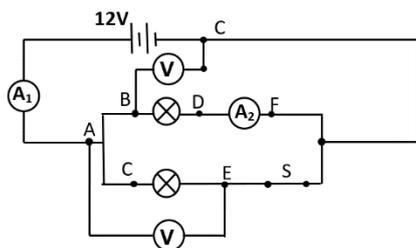
- A. cell reproduction
- B. cellular digestion
- C. energy production
- D. manufacturing of protein

89. Which one of the following statements is correct regarding the Milky Way Galaxy?



- A. The Milky Way Galaxy contains more than 100 billion stars and more than 100 billion planets.
- B. The Sun is located at the centre of the Milky Way Galaxy.
- C. The Milky Way Galaxy is part of our Solar System.
- D. The Milky Way Galaxy is the biggest galaxy in the Universe.

Study the diagram of the electric circuit and answer questions 90 to 92. All bulbs have the same resistance and the battery can supply a total potential difference of 12V.



90. The relationship between the readings on voltmeter V_{AE} and voltmeter V_{BC} is ...

- A V_{AE} is equal to V_{BC}
 B V_{AE} is greater than V_{BC}
 C V_{AE} is less than V_{BC}
 D V_{AE} equals $\frac{1}{2} V_{BC}$

91. Compare the readings on the Ammeters A_1 and A_2 after the switch (S) has been opened.

- A $A_1 > A_2$
 B $A_1 < A_2$
 C $A_1 = A_2$
 D $A_1 = 2 \times A_2$

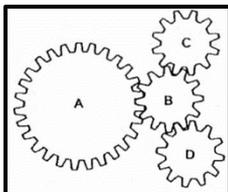
92. What will happen to the brightness of the bulb connected between C and E if the bulb connected between B and D burns out?

- A The bulb will stop functioning.
 B The bulb will glow brighter than before.
 C The bulb will glow less brightly than before.
 D The bulb will glow with the same brightness as before.

93. Which of the following factors does not affect the resistance of a conducting wire?

- A Length
 B Thickness
 C Type of a metal used
 D Potential difference

94. The diagram below shows a system of 4 gears, A, B, C and D.



When the gears start moving together, which gear moves in a direction that is different from the other three gears?

- A A
 B B
 C C
 D D

95. Who was the first female aviator to fly solo across the Atlantic Ocean?

- A Sandy Boeing
 B Amelia Earhart
 C Lee-Ann Lubitz
 D Amy Johnson

96. Which part of the airplane creates the lift?

- A The Pilot
 B The Propeller
 C The Rudder
 D The Wings

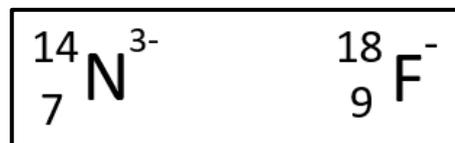
97. Which one of the following is NOT a mass meter?

- A Bathroom scale
 B Chemical balance
 C Kitchen scale
 D Newton spring balance

98. Which phase of water has the highest density?

- A Ice
 B Liquid water
 C Water vapour
 D Steam

99. Consider the following two ions and answer the question that follows:



Determine the number of electrons found around the nucleus of each ion.

	Nitrogen ion	Fluorine ion
A	7 electrons	9 electrons
B	3 electrons	8 electrons
C	10 electrons	10 electrons
D	14 electrons	18 electrons

100. The World Wide Web (WWW) began at _____, as a project named ENQUIRE, initiated by Tim Berners-Lee in 1989.

- A NASA in the United States of America
 B Oxford University in England
 C CERN in Switzerland
 D MIT in the United States of America

~ The End ~