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Natural Sciences Olympiad
GRADE 9

DATE: 06 AUGUST 2026

TIME: 90 MINUTES

INSTRUCTIONS:

1. This booklet has 50 multiple-choice questions.
2. 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.
3. All working details must be done in the space provided.
4. Calculators are permitted.
5. Diagrams are not necessarily drawn to scale.
6. Each question carries one mark.
7. You have 90 minutes for the paper, which works out to an average of 1.8 minutes per question.
8. Read the questions carefully before answering.
9. Visit the website: www.saolympiads.co.za.

ENJOY THE OLYMPIAD.

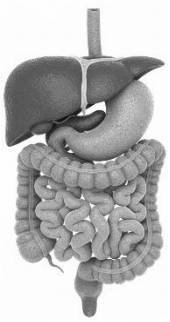
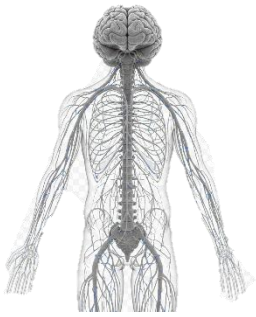
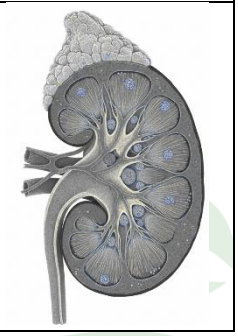
Grade 9 NS Olympiad 2026

Various options are provided to answer the following questions. Choose the correct answer and indicate the correct answer by circling the correct letter on the answer sheet provided. E.g., 1.1.1 – A. (see guide)

1. A learner is given an unknown tissue sample. Under a microscope, they observe a rigid outer boundary and green oval-shaped organelles, but **no** centrioles. Based on these specific observations, what is the most logical conclusion about the specimen's primary method of obtaining energy?

   A It consumes other organisms to obtain glucose.
   B It absorbs nutrients through a mouth-like opening.
   C It uses light energy to synthesize its own organic compounds.
   D It breaks down decaying matter in the soil through absorption. (1)

2. Arrange the following levels of organisation from simplest to most complex:

R	X	Y	Z
			

   A $R \rightarrow X \rightarrow Y \rightarrow Z$
   B $X \rightarrow Y \rightarrow Z \rightarrow R$
   C $X \rightarrow Z \rightarrow R \rightarrow Y$
   D $R \rightarrow Y \rightarrow Z \rightarrow X$ (1)

3. After switching from a low-power objective lens to a high-power objective lens, a student notices the specimen is visible but lacks sharpness. Which part should be used to bring the image into sharp focus without risking damage to the slide?

   A Coarse adjustment knob
   B Stage clips
   C Fine adjustment knob
   D Diaphragm (1)

4. When excess carbohydrates are consumed over long periods, the body mainly:

A Releases them as heat
B Stores them as fat for future use
C Converts them directly into protein
D Removes them through the kidneys (1)

5. A teenager regularly sleeps less than 5 hours per night due to screen use.
Which effect is MOST likely to occur over time?

A Improved concentration
B Faster muscle growth
C Disrupted hormone regulation
D Increased immune response (1)

6. Why are bacterial infections often treated early with antibiotics?

A To strengthen the immune system permanently
B To prevent bacteria from multiplying further
C To increase body temperature
D To reduce viral replication (1)

7. Prostate cancer occurs when cells in the prostate gland begin to grow uncontrollably. Which of the following best describes the primary function of the prostate gland in the male reproductive system?

A Producing the hormone testosterone
B Secreting fluid that nourishes and protects sperm
C Storing mature sperm until ejaculation
D Producing sperm cells for fertilisation (1)

8. The meningitis vaccine is recommended for teenagers entering hostels or dormitories. What is the main reason for this recommendation?

A Teenagers have weaker immune systems
B Close living spaces increase disease spread
C Vaccines only work before adulthood
D Meningitis only affects young people (1)

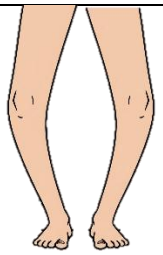
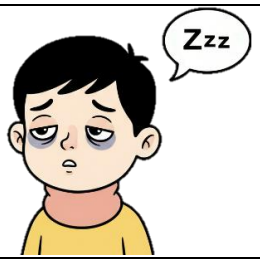
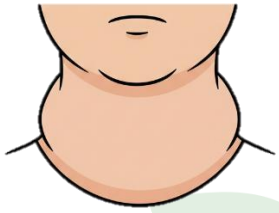
9. Which physiological change is LEAST associated with the onset of puberty in humans?

A Increased activity of sebaceous (oil) glands
B Accelerated ossification and bone elongation
C A permanent significant decrease in basal metabolic rate
D The development of secondary sexual characteristics (1)

10. In a first aid emergency involving arterial bleeding, direct pressure is applied to the wound. What is the PRIMARY physiological objective of this action?

A To stimulate the release of endorphins to reduce pain
B To assist the body's natural clotting process by slowing blood flow
C To prevent airborne pathogens from entering the bloodstream
D To increase local blood pressure to flush out debris (1)

11. Which of the following diagrams depicts a vitamin D deficiency?

A	B	C	D
			

12. Scientists now believe the tongue does NOT have separate taste zones. What does this suggest about taste receptors?

A Each receptor detects all tastes
B Taste depends only on smell
C Receptors work together across the tongue
D Taste buds only detect sweetness (1)

13. A pharmaceutical tablet is found to dissolve significantly faster in the stomach when crushed. This is because crushing the tablet:

A Decreases the density of the chemical compounds.
B Increases the total surface area available for the reaction.
C Catalyses a change in the water's temperature.
D Neutralises the stomach acid before it can react. (1)

14. When matching blood for transfusions, which factor is MOST critical?

A Age of donor
B Blood group compatibility
C Size of blood cells
D Diet of donor (1)

15. A learner feels dizzy after a head injury during sport.
What should be done NEXT?

A Allow rest and continue playing
B Give sugary drinks
C Seek medical evaluation
D Apply ice only (1)

16. In Nature, certain elements are never found as single atoms but exist as pairs.
Which of the following is a diatomic molecule?

A Helium
B Oxygen
C Carbon
D Neon (1)

17. Balance the equation:
$A\ell + O_2 \rightarrow A\ell_2O_3$

Which coefficient is needed in front of $A\ell$?

A 2
B 3
C 4
D 6 (1)

18. Iron "rusts," but Aluminium undergoes a process called passivation. Why is Aluminium considered more resistant to deep corrosion than Iron?

A It is a non-metal and does not react with oxygen.
B It forms a tough, microscopic oxide layer that seals the metal underneath.
C It has a much lower density than iron, preventing oxidation.
D It only reacts with nitrogen, not oxygen. (1)

19. Some people experience "nickel dermatitis" (skin irritation) from jewellery. This is usually caused by:

A A chemical reaction between the metal and the acidic nature of sweat.
B The transfer of heat from the body to the metal.
C Static electricity building up in the jewellery.
D Jewellery magnetic field interfering with blood flow. (1)

20. During a practical investigation, a teacher collects a gas produced by the reaction of Magnesium and Hydrochloric acid. When a burning wooden splint is placed at the mouth of the tube, a distinctive 'pop' sound is heard. This observation confirms the presence of:

A Oxygen gas, which supports combustion.
B Carbon dioxide, which is denser than air.
C Hydrogen gas, which is highly flammable.
D Nitrogen gas, which is chemically inert. (1)

21. Which household substance could act as a natural acid–base indicator?

A Red cabbage juice
B Sugar water with a dash of milk
C Salt solution
D Cooking oil mixed with vinegar (1)

22. Farms close to factories struggle with acid rain on their crops and soil. Which substance would BEST neutralise acid rain on soil?

A Vinegar
B Limestone powder
C Table salt
D Distilled water (1)

23. Some bakers use "starting cultures" (sourdough starters) to bake bread instead of store-bought yeast. These cultures can be over 100 years old and contain a living community of wild yeast and bacteria. During the fermentation process, these microbes consume sugars and release carbon dioxide gas as a byproduct.

What is the primary physical effect of this gas on the dough during the "proofing" (rising) stage?

A It acts as a preservative to prevent the bread from molding.
B It gets trapped in the gluten network, causing the dough to expand and become porous.
C It reacts with the flour to increase the nutritional density of the loaf.
D It lowers the temperature of the dough to slow down the baking process. (1)

24. Complete the general word equation for the reaction used in "volcano" science projects:
acid + carbonate → ____ + _____ + _____ (1)

A	Salt	Water	Oxygen
B	Salt	Water	Carbon dioxide
C	Base	Hydrogen	Water
D	Metal	Carbon dioxide	Heat

25. A parachute allows a skydiver to land safely. It works by increasing the upward force of:

A Gravitational pull
B Magnetic flux
C Air resistance (drag)
D Inertia (1)

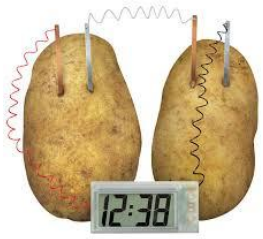
26. If two unequal forces act on a single object in opposite directions, the "net force" will cause the object to:

A Remain in a state of static equilibrium.
B Accelerate in the direction of the larger force.
C Move at a constant velocity toward the smaller force.
D Instantly lose all its mass. (1)

27. Some animals can detect changes in Earth's magnetic field.
Which behaviour does this ability support?

A Hunting
B Migration
C Camouflage
D Communication (1)

28. A potato can power a digital clock when connected correctly.
Which energy conversion occurs?

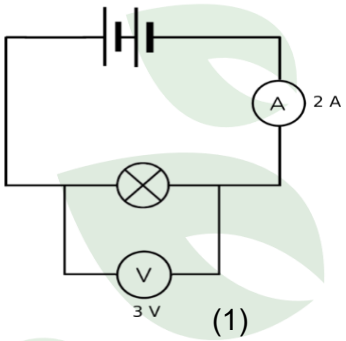


A Electrical → Chemical
B Chemical → Electrical
C Light → Electrical
D Heat → Electrical (1)

29. In South African households, plug points and light bulbs are connected in parallel. The most important reason for this is:

A To ensure that the total resistance of the house is as high as possible.
B To allow each appliance to be switched on or off independently.
C To divide the voltage equally between every appliance.
D To prevent the flow of current during a lightning storm. (1)

30. Study a circuit where a 3V battery is connected to a single bulb. If a second, identical battery is added in series without changing the bulb, what will happen to the current (I) and the resistance (R)?

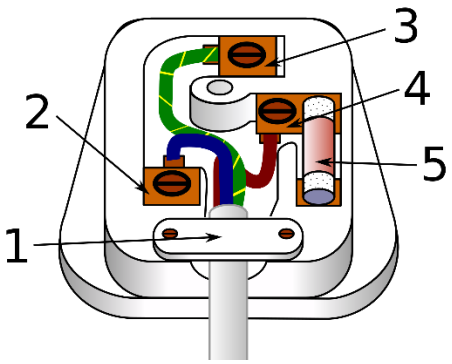


A I will double, and R will stay the same
B I will stay the same, and R will double.
C Both I and R will decrease.
D I will double, and R will decrease.
(1)

31. When a neutral object "loses electrons" the object will be …

A positive
B negative
C neutral
D none of the above (1)

32. The diagram below shows the front view of a standard three-pin plug used in South Africa. Each pin is connected to a specific wire with a unique color code and function. A learner is wiring a plug and correctly connects the **green and yellow** striped wire to the top-most pin (labeled **3**). What is the primary function of this specific pin and wire?



https://www.mmkelectricians.ie/how-to-wire-a-3-pin-plug/

A To provide a path for the current to return to the power source.
B To carry the high-voltage electrical energy to the appliance.
C To protect the user by directing leakage current safely into the ground.
D To act as a fuse that melts and breaks the circuit during an overload (1)

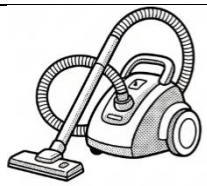
33. Why should wet hands never touch electrical switches?

A Water blocks electricity
B Water increases resistance
C Water conducts electricity
D Water cools circuits (1)

34. When load shedding ends and the electricity is switched back on, a "power surge" (a sudden, massive increase in voltage) can occur. This can "fry" the delicate circuits of a computer.
How does a UPS or a surge-protection plug protect an appliance from this voltage spike?

A It absorbs the extra electrical energy and turns it into light.
B It changes the electricity into Direct Current (DC) to slow it down.
C It acts like a "safety valve," diverting the excess voltage safely to the earth wire.
D It increases the frequency of the electricity so it moves through the appliance faster. (1)

35. Four different electrical appliances are used for exactly one hour. Which of the following will consume the least amount of electrical energy? (1)

A	B	C	D
ELECTRIC KETTLE: 2000 W	 VACUM CLEAINER: 1200 W	SMARTRHONE CHARGER: 5 W	MICROWAVE OVEN: 800 W

36. A learner compares two different light bulbs that produce the same amount of light (measured in lumens). They notice that after 10 minutes of use, the Incandescent bulb feels very hot to the touch, while the LED bulb remains cool.

Which statement best explains why the LED bulb is considered more energy-efficient?

A The LED bulb converts a higher percentage of electrical energy into light and wastes less as heat.
B The LED bulb uses more current to produce a brighter, warmer light.
C The Incandescent bulb is more efficient because the heat it produces can be used to warm the room.
D The LED bulb creates energy from nothing, allowing it to stay cool while shining brightly. (1)

37. A family wants to buy a new refrigerator that will be the most cost-effective to run over several years. When comparing two different models at the store, what is the most reliable scientific method to determine which appliance will use the least amount of electricity to perform the same task?

A Compare the physical size of the appliances; the smaller one always uses less energy.
B Look at the energy rating label (e.g., A+++ vs. B) and the estimated annual energy consumption in kWh.
C Check the purchase price; the more expensive appliance is always more efficient.
D Choose the appliance with the highest power rating (Watts) because it works faster. (1)

38. Your science class is building simple circuits, but you have run out of standard insulated copper connecting wires. You need to find a household material that can act as a conductor to complete the circuit and light up a bulb.

Which of the following would be the most effective substitute for a conducting wire?

A A nylon string
B An aluminium foil strip
C A plastic drinking straw
D A sheet of paper (1)

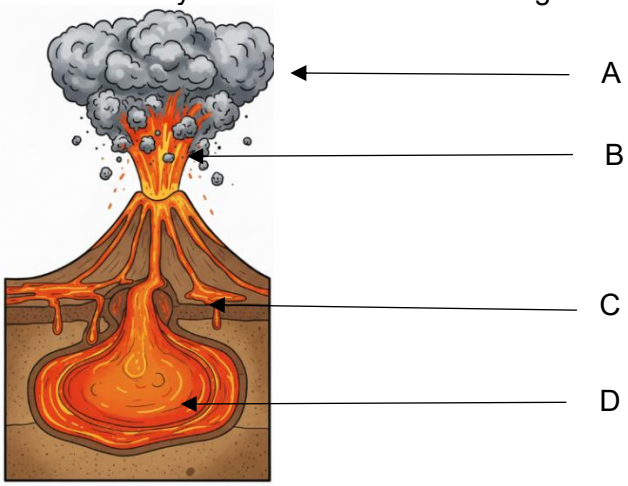
39. Rusting (oxidation) is a major problem for metal structures. Engineers often use "galvanisation" to protect iron. Which of the following describes how this structural adaptation works?

A It replaces the iron with plastic so it cannot react with water.
B It coats the iron with a layer of zinc, which reacts with oxygen first to protect the metal underneath.
C It uses a special paint that absorbs all the moisture from the air so the iron stays dry.
D It turns the iron into a liquid state so that oxygen cannot stick to the surface. (1)

40. In a closed terrarium (a sealed ecosystem), which biological process is the primary source of the oxygen required by the soil bacteria and the plants themselves during the night?

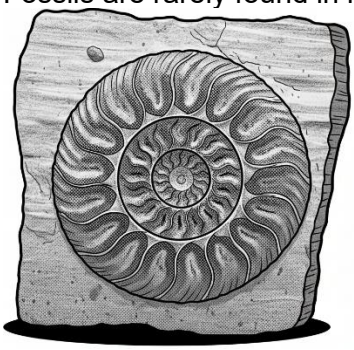
A Transpiration.
B Photosynthesis
C Decomposition
D Condensation (1)

41. Identify the area where extrusive igneous rocks are formed.



(1)

42. Fossils are rarely found in igneous rocks because:



A Magma destroys organic material
B Igneous rocks erode quickly
C Fossils dissolve in lava
D Sediments cannot form fossils (1)

43. Most modern mines are required to have a "Social and Labour Plan" and an environmental closure strategy. Which of the following best describes the process of rehabilitation after an open-cast mine is closed?

A Clearing more land to build a new factory on the site.
B Restoring the topsoil and vegetation to make the land stable and usable again.
C Leaving the pit open so it can naturally fill with rainwater for local animals.
D Moving the mining equipment to a different country to save costs. (1)

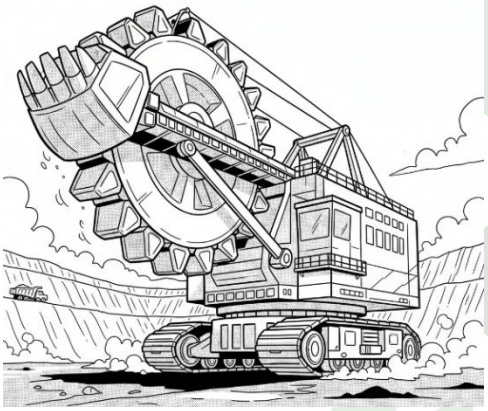
44. In parts of the Karoo, there is a large amount of natural gas trapped deep underground inside shale rock layers. To extract (mine) this gas, a process called fracking is used. This involves drilling deep into the Earth and pumping a high-pressure mixture of water, sand, and chemicals into the rock to crack it open.

What is the most significant environmental concern regarding the lithosphere and hydrosphere during this process?

A The process uses too much oxygen from the atmosphere, causing breathing problems for local animals.
B The high-pressure liquid can leak into underground aquifers, contaminating the fresh groundwater used by farmers.
C Fracking causes the shale rock to turn into igneous rock, which stops plants from growing.
D The natural gas released from the rock creates a vacuum that causes the Earth's crust to shrink. (1)

45. The following mining equipment is known as a …

A Dozer
B Electric rope shovel
C Bucket-wheel excavator
D High-wall excavators (1)



46. The President of the United States has shown great interest in the countries of Venezuela and Greenland in the beginning of 2026. From a scientific and economic perspective, why are these two regions strategically important?

A Venezuela has the world's largest rare earth metal reserves, and Greenland is rich in oil (petroleum).
B Venezuela has the world's largest oil (petroleum) reserves, and Greenland is rich in rare earth elements used in green technology.
C Both countries have discovered how to turn common sand into gold using cold temperatures.
D Both countries have strong established gold mines. (1)

47. *Kessler Syndrome* is a theory that space debris could start a chain reaction of collisions. Why is space debris a major threat to modern technology?

A It blocks the sun's rays, causing global cooling.
B It can destroy satellites used for GPS, weather, and communication.
C It creates "holes" in the atmosphere that let in extra UV radiation.
D It increases the Earth's gravitational pull on the moon. (1)

48. A 2024 MIT-led study has confirmed that the Antarctic ozone layer is finally healing. Based on your knowledge of the atmosphere, what was the primary global action that led to this healing process?

A Increasing the amount of carbon dioxide emissions.
B The global ban on the production and use of Chlorofluorocarbons (CFCs).
C Switching from wind energy back to coal power.
D Spraying large amounts of liquid oxygen into the stratosphere. (1)

49. The Sun is approximately 4.5 billion years old. Currently, it is a stable star that generates energy by fusing hydrogen into helium in its core.

Identify the current phase of the Sun's life cycle and predict what the next major stage will be when it eventually runs out of hydrogen fuel. (1)

	Current stage	**Next stage**
A	Nebula	Protostar
B	Main Sequence	Red Giant
C	White Dwarf	Black Hole
D	Supernova	Neutron Star

50. Which of the following is known as the "birthplace" or "nursery" of a star? (1)

A	B	C	D
Black hole	Nebula	Asteroid belt	Red giant

TOTAL MARKS = 50