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Natural Science & Technology Olympiad

GRADE 5

DATE: 20-21 AUGUST 2024

TIME: 90 MINUTES

INSTRUCTIONS:

1. This booklet has 50 multiple-choice questions.
2. Use the answer sheet provided.

   Circle the letter corresponding to your answer.
3. Each question carries one mark.
4. You have 90 minutes for the paper, which works out to an average of 1.8 minutes per question.
5. Read the questions carefully before answering.

ENJOY THE OLYMPIAD.

Grade Five Natural Science & Technology Olympiad 2024

Indicate the correct answer by circling the correct letter on the answer sheet provided.

1. Which of the following is NOT a type of fuel commonly burned for energy? (1)
   A) Coal
   B) Natural gas
   C) Water
   D) Oil

2. Why do we burn fuels like coal and natural gas? (1)
   A) To get water
   B) To produce energy
   C) To grow plants
   D) To make food

3. If a power plant burns natural gas to generate electricity, what form of energy is converted into electrical energy? (1)
   A) Thermal energy
   B) Mechanical energy
   C) Solar energy
   D) Nuclear energy

4. What is a common environmental effect of burning fossil fuels? (1)
   A) Increased plant growth
   B) Clean air
   C) Air pollution
   D) Decreased ocean levels

5. Imagine you are designing a new type of vehicle. What is an alternative to burning fossil fuels that you could use to power your vehicle in a more environmentally friendly way? (1)
   A) Gasoline
   B) Solar power
   C) Diesel
   D) Coal

6. Which of the following is a property of matter? (1)
   A) Volume
   B) Time
   C) Sound
   D) Light

7. Why does ice float on water? (1)
   A) Because ice is heavier than water
   B) Because ice has a lower density than water
   C) Because ice is hotter than water
   D) Because ice is darker than water

8. If you have a metal spoon and a plastic spoon, which property of matter can you use to determine which will heat up faster in hot soup? (1)
   A) Colour
   B) Hardness
   C) Conductivity
   D) Shape

9. You have a solid piece of wax and a liquid cup of water. Which property can help you identify that the wax is a solid and the water is a liquid? (1)
   A) Density
   B) Mass
   C) State of matter
   D) Temperature

10. Imagine you are creating a new material that needs to be lightweight and strong. Which two properties would be most important to consider in your design? (1)
    A) Colour and taste
    B) Density and hardness
    C) Volume and smell
    D) Temperature and shape

11. What is a common method used to preserve food? (1)
    A) Freezing
    B) Casting
    C) Measuring
    D) Packing

12. Why is recycling important in the processing of materials? (1)
    A) It increases the weight of products
    B) It helps conserve natural resources
    C) It makes products more expensive
    D) It reduces the number of products made

13. If you want to make a glass bottle from sand, which material processing method would you use? (1)
    A) Freezing
    B) Melting
    C) Crushing
    D) Painting

14. Which property of metals makes them suitable for making wires during material processing? (1)
    A) They are transparent
    B) They are magnetic
    C) They are ductile
    D) They are liquid

15. Who invented the first telescope? (1)
    A) Isaac Newton
    B) Capt. Refilwe Moreetsi
    C) Capt. Londy Ngcobo
    D) Hans Lippershey

16. What is soil primarily made from? (1)
    A) Plastic and glass
    B) Rocks and organic matter
    C) Water and air
    D) Metal and rubber

17. Why is organic matter important in soil? (1)
    A) It makes the soil harder
    B) It provides nutrients for plants
    C) It increases soil temperature
    D) It gives the soil a blue colour

18. If you wanted to improve the quality of your garden soil, which of the following could you add? (1)
    A) Sand
    B) Organic compost
    C) Plastic pellets
    D) Salt

19. Which layer of soil is most fertile and why? (1)
    A) Topsoil, because it has the most organic matter
    B) Subsoil, because it is deeper
    C) Bedrock, because it is the hardest
    D) Surface layer, because it has the most sunlight

20. Imagine you are creating a new type of soil for growing plants on Mars. What two main components would you need to include to ensure plant growth? (1)
    A) Sand and gravel
    B) Organic matter and minerals
    C) Water and plastic
    D) Salt and metal

21. What supplies energy in an electric circuit? (1)
    A) a conductor
    B) a battery
    C) wires
    D) light bulb

22. Why is clay soil not good for plants? (1)
    A) It is slow to drain water
    B) It is very quick to harden
    C) It blocks root absorption
    D) All of the above

23. Which soil type would be best for growing most garden plants? (1)
    A) Sand
    B) Clay
    C) Loam
    D) Rock

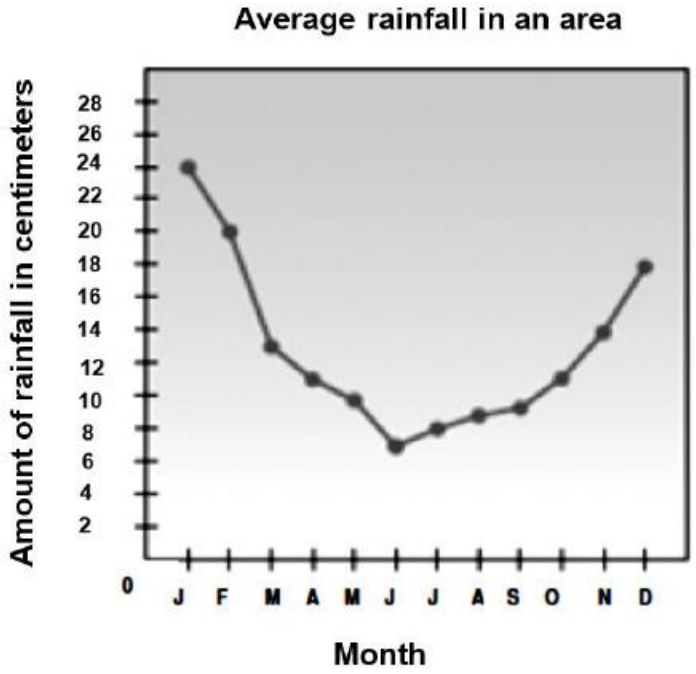
24. Which soil type has the smallest particles? (1)
    A) Sand
    B) Clay
    C) Loam
    D) Gravel

25. If you wanted to create soil that holds some water but also drains well, which two types of soil might you mix? (1)
    A) Sand and gravel
    B) Clay and loam
    C) Sand and clay
    D) Loam and sand

26. Which of the following is a type of rock? (1)
    A) Plastic
    B) Sandstone
    C) Water
    D) Paper

27. Why is granite used for building? (1)
    A) It is very soft
    B) It is very strong
    C) It is very light
    D) It is very shiny

The graph below shows the average rainfall in a specific area measured over a period of one (1) year. Study the graph and answer questions 28 to 31.



28. What is the difference in rainfall figures when comparing the months of January and December? (1)
    A) 6 centimetres
    B) 24 centimetres
    C) 18 centimetres
    D) 4 centimetres

29. Which month was the driest in this area? (1)
    A) August
    B) June
    C) January
    D) All the months

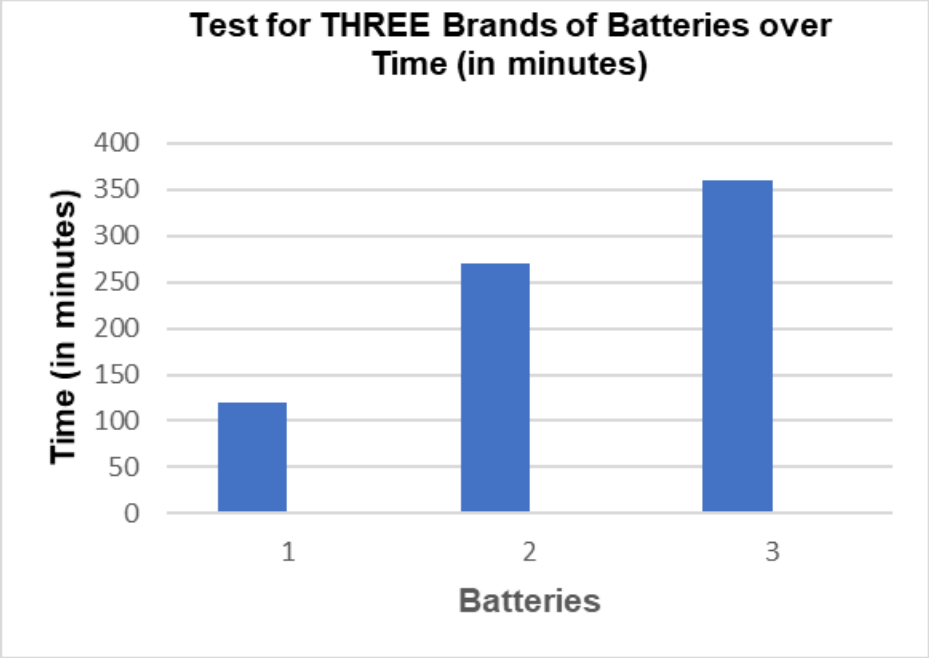
30. How much rain fell in that month mentioned in question? (1)
    A) 7 centimetres
    B) 6 centimetres
    C) 18 centimetres
    D) 24 centimetres

31. What was the average rainfall during the first six months? (1)
    A) 24 centimetres
    B) 14 centimetres
    C) 6 centimetres
    D) 85 centimetres

32. How are sedimentary rocks formed? (1)
A) By cooling of lava
B) By layers of sediment pressing together
C) By melting in the Earth's core
D) By lightning striking rocks

33. If you find a rock with visible layers, what type of rock is it most likely to be? (1)
A) Igneous
B) Sedimentary
C) Metamorphic
D) Volcanic

34. Thembi tested THREE brands of batteries to learn which would last longest in a flashlight. She placed two brand A batteries in a flashlight, turned the flashlight on, and measured the time the light shined. Using the same flashlight, she repeated the experiment with battery brands B and C. She recorded the data on the bar graph below. Which of these is an accurate conclusion that Thembi can make about the batteries she tested? (1)



A) Brand C batteries lasted twice as long as brand A batteries.
B) The light was twice as bright with brand A batteries than with brand B batteries
C) Brand C batteries lasted three times longer than brand B batteries
D) The light shined three times farther with brand C batteries than with brand B batteries

35. If you wanted to explain to your friend how a sedimentary rock is made, which materials could you use to demonstrate the process? (1)
    A) Sand, water, and pressure
    B) Lava, ice, and time
    C) Heat, metal, and electricity
    D) Wind, clay, and fire

36. Why are fossils important to scientists? (1)
    A) They make pretty decorations
    B) They help us understand past life on Earth
    C) They can be turned into fuel
    D) They change colour in the sun

37. If a scientist finds a dinosaur fossil in South Africa, what can it tell us about the area? (1)
    A) It used to be a desert
    B) Dinosaurs once lived there
    C) It had no plants or animals
    D) It was always underwater

38. What can the presence of many fossils in South Africa tell us about its ancient environment? (1)
    A) It was always icy
    B) It had diverse plant and animal life
    C) It never changed
    D) It was always dry

39. Imagine you are a palaeontologist studying fossils in South Africa. Which tools and methods would you use to learn about ancient animals? (1)
    A) Telescope and microscope
    B) Microscopes
    C) Paint and canvas
    D) Brush and excavation tools

40. What are the three main states of matter? (1)
    A) Solid, liquid, gas
    B) Cold, warm, hot
    C) Light, dark, shadow
    D) Big, medium, small

41. What happens to water when it freezes? (1)
    A) It turns into steam
    B) It becomes a solid
    C) It stays a liquid
    D) It disappears

42. What phase change will occur if you heat a block of ice? (1)
    A) Freezing
    B) Melting
    C) Condensing
    D) Sublimating

43. Why does a puddle of water on the ground disappear on a sunny day? (1)
    A) It sinks into the ground
    B) It evaporates into the air
    C) It freezes
    D) It turns into a solid

44. When a solid changes to a gas, that phase change is called… (1)
    A) Melting
    B) Boiling
    C) Sublimation
    D) Deposition

45. Which of the following describes the particles in a gas state of matter? (1)
    A) Closely packed
    B) Fixed position
    C) Spread out and moving freely
    D) Arranged in a regular pattern

46. The _____ protects the brain in the skeleton. (1)
    A) Skull
    B) Ribs
    C) Shoulder blade
    D) Spine

47. If you want to turn water vapour back into a liquid, what process would you use? (1)
    A) Freezing
    B) Boiling
    C) Condensation
    D) Sublimation

48. Why does a glass of cold water "sweat" on a hot day? (1)
    A) It is crying
    B) The glass is leaking
    C) Water vapour in the air condenses on the cold glass
    D) The water is evaporating

49. If you were designing a new cooking pot that could heat food quickly, which material would be best to use for efficient heat transfer during the cooking process? (1)
    A) Plastic
    B) Wood
    C) Glass
    D) Metal

50. What is technology? (1)
    A) Animals living in the wild
    B) Tools, machines, and systems used to solve problems and accomplish tasks
    C) The study of stars and planets
    D) Food grown on farms

TOTAL MARKS = 50