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Natural Science & Technology Olympiad
GRADE 6

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 1 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 Six 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 an example of a solid? (1)
   A) Juice
   B) Rock
   C) Oil
   D) Smoke

2. Water vapour in the air condenses to form liquid water droplets. This process is an example of: (1)
   A) Vapourasation
   B) Condensation
   C) Sublimation
   D) Deposition

3. If you want to separate a mixture of your stationery in your pencil case, which separation method would you use? (1)
   A) Decanting
   B) Hand sorting
   C) Magnetism
   D) Sieving

4. Zama observed that when a solid is heated, it changes to a liquid. When heated further, it changes to a gas. What is the phase change called when a liquid changes to a gas? (1)
   A) Boiling
   B) Disappearing
   C) Evaporation
   D) Dilute

5. Xiva says that the fire is in the fourth state of matter, plasma. Is she correct? (1)
   A) Agree because fire is something magical.
   B) Disagree because fire has smoke, so it is a gas.
   C) Agree because fire is an ionised gas.
   D) Disagree because evaporation is the process of molecules leaving the surface of any substance.

6. Which of the following foods is a source of carbohydrates? (1)
   A) Meat
   B) Eggs
   C) Bread
   D) Cheese

7. Eating too much junk food such as chips, soda and sweets can lead to diseases such as: (1)
   A) Heart problems
   B) Obesity
   C) Diabetes
   D) All of the above

8. If a person is allergic to gluten, which foods should they avoid? (1)
   A) Rice
   B) Potatoes
   C) Wheat
   D) Vegetables

9. You want to plan a balanced meal that includes all the essential nutrients. Which combination of foods would best achieve this? (1)
   A) Grilled chicken, brown rice, and broccoli
   B) Cheeseburger, french fries, and a milkshake
   C) Pasta with tomato sauce and a side salad
   D) Pizza and a soda

10. Your classmate believes that skipping meals and cutting off some nutrients is a healthy way to lose weight. This type of diet is called… (1)
    A) An Improper Diet
    B) A Fad Diet
    C) A Ketogenic Diet
    D) A Vegetarian diet

11. Another name for plants in an ecosystem is… (1)
    A) Consumers
    B) Producers
    C) Algae
    D) Herbivores

12. Animals that eat plants only are called… (1)
    A) Carnivores
    B) Omnivores
    C) Herbivores
    D) Insectivores

13. The ability to do work is… (1)
    A) Power
    B) Work
    C) Gravity
    D) Energy

14. The unit for measuring energy is called… (1)
    A) Metres
    B) Joules
    C) Kilograms
    D) Newtons

15. [ ] is a unit of energy often used to express the nutritional value of food. (1)
    A) An index
    B) A weight
    C) A calorie
    D) A mass

16. What is the role of producers in an ecosystem? (1)
    A) To consume other organisms for food
    B) To break down dead organisms
    C) To make their food through photosynthesis
    D) To hunt and eat other animals

17. In a food chain, what do the arrows represent? (1)
    A) The direction of energy flow
    B) The migration of organisms
    C) The sequence of organism
    D) None of the above

18. If a new herbivore species is introduced into an ecosystem, how would it most likely affect the food web? Which option is incorrect? (1)
    A) It would create a new food chain
    B) It would disrupt the existing food chains
    C) It would have no impact on the food web
    D) It would eliminate the need to produce

19. A good example of a non-Newtonian fluid is… (1)
    A) Ice-cream
    B) Water
    C) Oobleck
    D) Cough Syrup

20. Which statements are true about photosynthesis? (1)

(i)	Plants make their food.
(ii)	Through photosynthesis, plants keep the ecosystem running.
(iii)	Chlorophyll is the green pigment found on the leaves.
(iv)	Photosynthesis is all about plants rotting
(v)	Photosynthesis is all about plant irrigation.

A) (ii), (iii) and (iv)
B) (iii), (iv) and (v)
C) (i), (iii) and (iv)
D) (i), (ii) and (iii)

21. In the digestive system, stomach acids are called… (1)

A) Digestion acids
B) Chewing acids
C) Breaking down acids
D) Gastric acids

22. Which of the following is NOT an advantage of washing your hands before eating? (1)
A) You avoid problem health problems.
B) You can do well in your school assessment.
C) Hygiene is good for your health.
D) Reduced level of contamination.

23. Which of the following is a product of photosynthesis? (1)
A) Oxygen
B) Carbon dioxide
C) Water
D) Chlorophyll

24. During photosynthesis, plants use energy from sunlight to convert carbon dioxide and water into: (1)
A) Glucose and oxygen
B) Glucose and carbon dioxide
C) Oxygen and water
D) Chlorophyll and glucose

25. Composting involves… (1)
A) Processing waste materials such as paper, glass, metal etc.
B) Managing waste and collecting it.
C) Turning waste from plants, food scraps and garden cutting into nutrients for the soil.
D) Turning waste materials and selling them for income.

26. Look carefully at the following equation for photosynthesis:
$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$.

Which combination is correct about reactants and products? (1)
A) Water is a product and is used up during photosynthesis.
B) Carbon dioxide is a product and is released during photosynthesis.
C) Carbon dioxide is a reactant and oxygen is a product involved in photosynthesis.
D) Photosynthesis is both a reactant and a product.

27. Which of the following diseases is associated with a diet high in saturated fats and cholesterol? (1)
A) Anaemia
B) Scurvy
C) Cardiovascular disease
D) Osteoporosis

28. A person with diabetes needs to be mindful of their intake of which nutrient? (1)
A) Protein
B) Carbohydrates
C) Fats
D) Vitamins

29. If a person wants to reduce their risk of developing obesity, which dietary recommendation would be most effective? (1)
A) Increase consumption of sugary drinks.
B) Eat more processed and fried foods.
C) Limit portion sizes and eat more fish, brown rice, fruits and vegetables.
D) Eat whatever you like, you live once anyway.

30. Cocomelon has been diagnosed with iron deficiency anaemia. Which of the following dietary changes would help address this condition? (1)
A) Consuming more dairy products.
B) Increasing intake of leafy green vegetables and red meat.
C) Eating more processed snacks and sweets.
D) Drinking more carbonated beverages.

31. How did indigenous people process their food to avoid spoilage? (1)
A) They used the freezing method.
B) They used irradiation.
C) They added chemicals.
D) None of the above.

32. Which of the following material is a good conductor of electricity? (1)
    A) Rubber
    B) Plastic
    C) Wood
    D) Copper

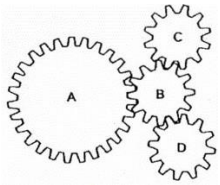
33. Static electricity is a buildup of: (1)
    A) Positive charges
    B) Negative charges
    C) Both positive and negative charges
    D) Neutral charges

34. Which of the following describes the flow of electric current in a circuit? (1)
    A) Electric current flows from negative to positive
    B) Electric current flows from positive to negative
    C) Electric current flows in both directions
    D) Electric current does not flow in a circuit

35. Lightning is an example of? (1)
    A) Natural light
    B) Static electricity
    C) Current electricity
    D) Direct current

36. Element Zinc is an example of a… (1)
    A) Metalloid
    B) Metal
    C) Material
    D) Non-metal

37. The diagram below shows a system of 4 gears: A, B, C and D. (1)



When the gears start moving together, which gear moves in a different direction from the other three gears?
    A) A
    B) B
    C) C
    D) D

38. Which one is an example of a solute and a solvent below? (1)
A) Salt and water
B) Juice and disprin
C) Milk and vinegar
D) Water and Sugar

39. The King Protea is an example of a/an…. (1)
A) Flowering plant
B) Non-Flowering plant
C) Unwanted plant
D) Exotic plant

40. Which of the following is the name of the first artificial satellite launched into space? (1)
A) Sputnik 1
B) Apollo 11
C) Hubble
D) Voyager 1

41. An explosion of a star is called… (1)
A) Gas
B) Binoculars
C) Supernova
D) Blackholes

42. Distilled water is… (1)
A) Normal tap water
B) Sparkling water.
C) The type of water that has impurities removed.
D) The type of water that is dirty and it is suitable for animals.

43. Which of the following technologies is used to study the composition of stars and planets? (1)
A) Spectroscopy
B) Microscopy
C) Telescopes
D) Photography

44. The acronym SALT in astronomy stands for… (1)
A) South Europe's Largest Telescope
B) South Africa's Largest Telescope
C) Southern African Large Telescope
D) South Asia's Large Telescope

45. You have been tasked with designing a spacecraft to explore the surface of Mars. Which technology would be most useful for this mission? (1)
    A) Rovers
    B) Satellites
    C) Space shuttles
    D) Telescopes

46. Which of the following is NOT the cause of black holes in space? (1)
    A) When a big mass is packed in a small volume.
    B) When the sun's strongest rays hit the space.
    C) The energy that holds the star disappears.
    D) When giant stars collapse.

47. How can the rhino-poaching problem be solved? Choose the best suitable option: (1)
    A) Educate people to raise awareness.
    B) Donate to stop rhino poaching.
    C) Help relocate rhinos to safe places.
    D) All of the above.

48. Deforestation is the planned destruction of forests by humans. Which of the following is not an impact of deforestation? (1)
    A) Disappearing of animal habitats
    B) Disturbance of ecosystems
    C) Photosynthesis
    D) Water pollution

49. A solution is when a mixture becomes homogeneous. Is this correct? (1)
    A) Yes, homogeneous is the same as hormones.
    B) Yes, homogenous means that the mixture is the same across.
    C) No, homogeneous means heterogeneous.
    D) No, homogenous means dissolving.

50. Who invented the first cell phone? (1)
    A) Albert Einstein
    B) Isaac Newton
    C) Cooper Leaf
    D) Martin Cooper

TOTAL MARKS = 50