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General Science, 2017 EC, Grade 8 model exam, Arada

Grade 8 · General Science · 2017 E.C.

MARKING KEY: CONFIDENTIAL

Time allowed: 120 minutes | **Questions:** 59 | **Total marks:** 59

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1. Which branch of natural science explores the chemical process with in and related to living organisms. (1)

A. Biophysics
B. ✓ **Biochemistry**
C. Physical chemistry
D. Geology

> **Answer:** B
> Biochemistry is the branch of science that studies chemical processes within and relating to living organisms.

2. Which of the following is correct about indigenous knowledge? (1)

A. ✓ **It is established by local people**
B. It is integral part of the research process
C. It is system of knowledge established through scientific method
D. It is commonly recognized as western science

> **Answer:** A
> Indigenous knowledge is the unique, local, traditional knowledge developed by communities over generations in a specific geographic area.

3. Who apply science and mathematical knowledge and skills to produce a very useful tool? (1)

A. Technology
B. ✓ **Technologist**
C. Science
D. Researchers

> **Answer:** B
> A technologist is a person who applies scientific and mathematical knowledge to create and develop practical tools and technologies.

4. Who is a famous Ethiopian scientist works on human physiology, the impacts of pesticides on human health and uses of medicinal plants? (1)

A. Dr.Akiliu Lema
B. ✓ **Prof.Yalemtsehay Mekonnen**
C. Dr. Tewolde Berhane
D. Prof. Gabisa Ejeta

> **Answer:** B
> Professor Yalemtsehay Mekonnen is a highly acclaimed Ethiopian physiologist and pharmacologist who research focuses on human physiology, the impact of pesticides on human health, and Ethiopian medicinal plants.

5. Which one of the following is the world famous scientist who developed special relativity theory? (1)

A. ✓ **Albert Einstein**
B. Michael Faraday
C. Isaac Newton
D. Marie Curie

> **Answer:** A
> Albert Einstein developed the Special and General theories of relativity, which revolutionized modern physics.

6. A metallic apparatus which supports the wire gauze is:- (1)

A. ✓ **a tripod stand**
B. ring stand
C. Test tube stand
D. Ring clamp

> **Answer:** A
> A tripod stand is a three-legged laboratory equipment commonly used to support wire gauze and containers during heating with a Bunsen burner.

7. Which of the following is not true about main ideas in the particle model of matter? (1)

A. All matter is made up of tiny particles
B. The particles of matter move continuously
C. There are force between the particles
D. ✓ **Adding heat to matter makes the particle move slower**

> **Answer:** D
> According to the particle model of matter, adding heat to a substance increases the kinetic energy of its particles, causing them to move faster, not slower.

8. Which of the following terms used to describe the odor of Doro wet? (1)

A. Fruity
B. Pungent
C. Fragrant
D. ✓ **spicy**

> **Answer:** D
> Doro wet is a highly spiced traditional Ethiopian chicken stew; therefore, its odor is best described as spicy.

9. What is the direct conversion of solid ice to gas? (1)

A. Freezing
B. Condensation
C. ✓ **Sublimation**
D. Deposition

> **Answer:** C
> Sublimation is the direct phase transition of a substance from the solid phase to the gas phase without passing through the liquid state.

10. Which of the following is not property of solid? (1)

A. Particles are orderly arranged
B. Particles are not compressible
C. ✓ **Diffuse in all direction with random motion**
D. Have definite shape and volume

> **Answer:** C
> Rapid diffusion in all directions with random motion is characteristic of gases, whereas particles in solids are held in fixed positions and only vibrate.

11. The roughness or smoothness of substance is called _____? (1)

A. Taste
B. ✓ **Texture**
C. Odor
D. Color

> **Answer:** B
> Texture is the physical property that describes the feel of a surface, such as its roughness or smoothness.

12. Out of the following which one is intensive property of matter? (1)

A. Mass
B. Length
C. ✓ **Density**
D. Volume

> **Answer:** C
> Density is an intensive physical property because it does not depend on the amount of substance present, unlike mass, length, and volume.

13. Which of the following is true about chemical property of substance? (1)

A. Identity of substance cannot be changed physical process
B. Easily identified by viewing or touching
C. It is easily reversed to original substance by
D. ✓ **Describes the formation of new substance**

> **Answer:** D
> Chemical properties describe the ability of a substance to undergo a chemical change that alters its identity and results in the formation of new substances.

14. The density of a substance is defined as the ---? (1)

A. ✓ **Ratio of its mass to volume**
B. Product of its weight and volume
C. Ratio of its weight to volume
D. Product of its mass and volume

> **Answer:** A
> Density is defined as mass per unit volume, which is mathematically represented as the ratio of mass to volume.

15. Which of the following is not property of metals? (1)

A. Metals are ductile
B. ✓ **Metals are brittle**
C. Metals are lustrous
D. Metals have high density

> **Answer:** B
> Metals are typically malleable and ductile (can be drawn into wires) rather than brittle; brittleness is a characteristic of solid non-metals.

16. All of the following are heterogeneous mixtures except : (1)

A. Blood
B. Ink
C. ✓ **Brass**
D. Smoke

> **Answer:** C
> Brass is a solid solution (alloy) of copper and zinc, which makes it a homogeneous mixture, whereas blood, ink, and smoke are heterogeneous mixtures (colloids).

17. Which one of the following element can be classified under metalloid element? (1)

A. ✓ **Silicon**
B. Bromine
C. Mercury
D. Manganese

> **Answer:** A
> Silicon is classified as a metalloid because it exhibits properties of both metals and non-metals.

18. Mixtures are substances that consists of (1)

A. Two or more elements chemically combined in a fixed ratio.

B. One types of atom.

C. ✓ **Two or more pure substances**

D. The simplest type of matter that retains characteristic property.

> **Answer:** C
> A mixture is a physical combination of two or more pure substances in which each substance retains its own chemical identity.

19. Which of the following is classified under a compound? (1)

A. Coca cola

B. Silver

C. ✓ **Sugar**

D. Air

> **Answer:** C
> Sugar (such as sucrose, C12H22O11) is a compound made of chemically combined elements in a fixed ratio, whereas silver is an element, and coca cola and air are mixtures.

20. Your General science teacher wants to investigate preparation of oxides by burning a yellow sulfur powder which is changed to red-brown color this change is: (1)

A. ✓ **Chemical change**

B. Mechanical change

C. Change of state

D. Physical change

> **Answer:** A
> Burning sulfur reacts chemically with oxygen to produce sulfur dioxide, a new substance, representing a chemical change.

21. A physical change is a change that (1)

A. Forms a substance with new composition

B. Results in the formation of new property

C. Results in the formation of new substance

D. ✓ **Does not alter the composition of the substance**

> **Answer:** D
> A physical change affects the form of a chemical substance but does not alter its chemical composition.

22. Which of the following characteristics distinguishes chemical change from physical change? Chemical change is (1)

A. No new substance is formed ,while physical change forms new substance

B. Easily reversed ,while physical change is difficult to reverse

C. ✓ **A change in the composition of substance, while physical change is not altered**

D. Energy change is not necessary, while in physical change energy change is necessary

> **Answer:** C
> A chemical change involves a transformation in the chemical composition and identity of the substance, whereas a physical change does not change the identity of the substance.

23. The separation method that used to separate to immiscible liquids like oil and water is (1)

A. Simple distillation
B. Evaporation
C. Filtration
D. ✓ **Decantation**

> **Answer:** D
> Decantation, often aided by a separatory funnel, is used to separate two immiscible liquids (like oil and water) by pouring off or draining the denser liquid layer.

24. Which of the following method of separation of mixtures used to separate suspended solids from liquids? (1)

A. ✓ **Filtration**
B. Decantation
C. Simple distillation
D. Evaporation

> **Answer:** A
> Filtration is a separation method specifically designed to separate insoluble suspended solid particles from a liquid by passing the mixture through a filter medium.

25. If you are asked to separate and collect the salt crystal and water from a mixture of salt solution ,which method of separation can be used? (1)

A. Evaporation
B. ✓ **Simple distillation**
C. Decantation
D. Sedimentation

> **Answer:** B
> Simple distillation allows you to heat the mixture to vaporize the water, condense it, and collect it in a separate flask, leaving the dry salt crystals behind, thereby recovering both components.

26. What is the name of an element having the chemical symbol "Hg"? (1)

A. Silver
B. ✓ **Mercury**
C. Lead
D. Gold

> **Answer:** B
> The chemical symbol 'Hg' represents Mercury, which comes from its Greek name 'hydrargyrum' meaning liquid silver.

27. Which of the following elements correctly matched with its Latin name? (1)

A. Sodium ---Kalium
B. Silver--- Aurum
C. Lead ---Stannum
D. ✓ **Iron ---Ferrum**

> **Answer:** D
> Iron is correctly matched with its Latin name 'Ferrum' (symbol Fe). Sodium is 'Natrium', Silver is 'Argentum', and Lead is 'Plumbum'.

28. Which of the following chemical formula is formula of iron(III)Sulphate? (1)

A. FeSO 4
B. ✓ **Fe 2 (SO 4) 3**
C. Fe 3 (SO 4) 2
D. Fe(SO 4) 3

> **Answer:** B
> Iron(III) sulfate contains Fe^{3+} and SO_4^{2-} ions. Balancing their charges gives the chemical formula $Fe_2(SO_4)_3$.

29. Quantitatively, the formula 2Cl 2 represents (1)

A. 1 molecule of chlorine
B. 4molecules of chlorine
C. 2 atoms of chlorine
D. ✓ **2 molecules of chlorine**

> **Answer:** D
> The formula $2Cl_2$ consists of a coefficient of 2, indicating two molecules of diatomic chlorine gas (Cl_2).

30. In the reactions between Oxygen molecule and hydrogen molecule which gives water. In the above reaction what is the coefficient of water? (1)

A. ✓ **2**
B. 1
C. 3
D. 4

Answer: A
The balanced chemical equation for the formation of water is $2H_2 + O_2 \rightarrow 2H_2O$, where the coefficient of water (H_2O) is 2.

31. What is the byproduct of photosynthesis? (1)

A. H 2 O & C 6 H 12 O 6
B. ✓ **O 2 & C 6 H 12 O 6**
C. H 2 O & O 2
D. CO 2 & H 2 O

Answer: B
Photosynthesis uses carbon dioxide and water to produce glucose ($C_6H_{12}O_6$) and oxygen (O_2), where oxygen is released as a byproduct.

32. Which of the following chemical reaction used for synthesis of ammonia? (1)

A. ✓ **By the reaction of hydrogen and nitrogen**
B. By the reaction of hydrogen and oxygen
C. By the reaction of methane and oxygen
D. By the reaction of sulphure and oxygen

Answer: A
Ammonia (NH_3) is synthesized industrially via the Haber-Bosch process, which involves the reaction of hydrogen and nitrogen gases under high pressure and temperature.

33. Which of the following organic compounds used for cleaning of wounds in clinics and hospitals? (1)

A. Formalin
B. Ethyne
C. Vinegar
D. ✓ **Ethanol**

Answer: D
Ethanol (commonly at 70% concentration) is widely used in healthcare facilities as an antiseptic and disinfectant to clean wounds and skin.

34. Which of the following pairs of oxides are acid anhydrides? (1)

A. ✓ **SO_2, P_2O_5, N_2O_5**
B. CaO, Na_2O, MgO
C. N_2O, Li_2O, NO
D. K_2O, CO, H_2O

Answer: A
Acid anhydrides are non-metal oxides that react with water to form acidic solutions; SO_2, P_2O_5, and N_2O_5 are all non-metal acidic oxides.

35. When an acid reacts with active metals, which one of the following gas is usually liberated? (1)

A. Oxygen gas
B. ✓ **Hydrogen gas**
C. Chlorine gas
D. Nitrogen gas

Answer: B
When an active metal reacts with an acid, it undergoes a single-displacement reaction that typically releases hydrogen gas (H_2).

36. If you burn magnesium in the presence of air, what will be the possible product formed? (1)

A. $Mg(OH)_2$
B. ✓ **MgO**
C. Mg_2O_2
D. Mg

> **Answer:** B
> Burning magnesium in air reacts it with oxygen to form magnesium oxide, which has the empirical and molecular formula MgO.

37. Suppose you are in science laboratory. Take two clean test tubes and pour 5 ml of NaOH solution in each of the tubes. Labeling the test tubes as A and B, then insert a blue litmus paper in A and red litmus in B. Which one of the following would be observed? (1)

A. ✓ **The litmus paper in B changed to blue**
B. The litmus paper in A changed to red
C. Sour taste is felt around both test tubes
D. The litmus paper in B changed to pink

> **Answer:** A
> Sodium hydroxide (NaOH) is a strong base. Bases turn red litmus paper to blue, so the red litmus in test tube B will turn blue.

38. What is the formula of a salt formed from nitric acid and potassium hydroxide? (1)

A. KNO_2
B. ✓ **KNO_3**
C. $KHNO_3$
D. $K(NO_3)_2$

> **Answer:** B
> The reaction of nitric acid (HNO_3) and potassium hydroxide (KOH) is a neutralization reaction that yields water and the salt potassium nitrate (KNO_3).

39. Which of the following is an application of neutralization reaction? (1)

A. Making of car battery
B. ✓ **Treatment of factory wastes**
C. Production of soaps
D. Preparation of ammonia

> **Answer:** B
> Neutralization is commonly applied in industry to treat acidic or alkaline factory wastes before they are safely discharged into the environment.

40. The idea of atom was first proposed by the Greek philosopher _____ (1)

A. Dalton
B. Aristotle
C. ✓ **Democritus**
D. Socrates

> **Answer:** C
> The ancient Greek philosopher Democritus first proposed the concept of indivisible particles of matter, which he named 'atomos' (indivisible).

41. The central parts of an atom consisting both proton and neutron is: (1)

A. Atomic number
B. Mass number
C. ✓ **Nucleus**
D. Electronic shell

> **Answer:** C
> The nucleus is the extremely dense, central region of an atom that contains both protons and neutrons.

42. An element has 92 protons, 92 electrons and 238 mass number. So what is its neutron number? (1)

A. 92
B. 184
C. 238
D. ✓ **146**

> **Answer:** D
> The number of neutrons is found by subtracting the atomic number (protons, 92) from the mass number (238), which equals 146.

43. A neutral atom has 16 neutrons and a mass number of 31, what will be its atomic number? (1)

A. 16
B. ✓ **15**
C. 31
D. 47

> **Answer:** B
> The atomic number represents the number of protons, which is calculated by subtracting the number of neutrons (16) from the mass number (31) to get 15.

44. Which of the following is categorized under molecule of compound? (1)

A. Br_2
B. O_3
C. Ne
D. ✓ **H_2O**

> **Answer:** D
> A molecule of a compound consists of two or more different elements chemically bonded together; H_2O contains hydrogen and oxygen, whereas the others are elements.

45. Which one of the following molecule is polyatomic? (1)

A. ✓ **P_4**
B. Cl_2
C. Xe
D. I_2

> **Answer:** A
> A polyatomic molecule contains more than two atoms. P_4 (white phosphorus) contains four atoms, while Cl_2 and I_2 are diatomic and Xe is monoatomic.

46. Organic compound is defined as the study of (1)

A. Compounds obtained from minerals
B. ✓ **Carbon containing compounds**
C. Non-carbon containing compounds
D. Nitrogen containing compounds

> **Answer:** B
> Organic chemistry is defined as the study of carbon-containing compounds, with a few exceptions like carbon oxides and carbonates.

47. What is the chemical formula of alkyne that contains 20 hydrogen atoms? (1)

A. $C_{20}H_{38}$
B. $C_{11}H_{22}$
C. ✓ **$C_{11}H_{20}$**
D. $C_{20}H_{40}$

> **Answer:** C
> The general formula for alkynes is C_n H_{2n-2}. For an alkyne with 20 hydrogens, 2n - 2 = 20, which gives n = 11, resulting in $C_{11}H_{20}$.

48. Which of the following represents a tentative explanation of certain scientific law? (1)

A. ✓ **Hypothesis**
B. Observation
C. Theory
D. Analyzing result

> **Answer:** A
> A hypothesis is a tentative, testable explanation for a set of observations or a scientific phenomenon.

49. Which of the following statement is correctly presented in relation to the components of scientific investigation? (1)

A. Data collection is done before observation in science
B. ✓ **Scientific investigation usually begins with observation**
C. Scientific investigation should start with hypothesis testing
D. Hypothesis is tested before conducting experiment

> **Answer:** B
> A scientific investigation typically begins with making observations, which lead to questions, a hypothesis, and subsequent experimental testing.

50. Among scientific methods, which steps concerned on putting together your findings and presenting them to others? (1)

A. ✓ **Communicating result**
B. Test your hypothesis
C. Analyze result and draw conclusion
D. Establish your hypothesis

> **Answer:** A
> Communicating results is the final step of the scientific method where scientists share their findings, methodologies, and conclusions with the wider scientific community and public.

51. A process of finding the answer to a question using various research method is ____? (1)

A. Measurement
B. ✓ **Scientific investigation**
C. Physical quantity
D. Prefix

> **Answer:** B
> A scientific investigation is a systematic process of asking questions, performing research, and experimenting to find answers about the natural world.

52. All of the following are true about the historical development of atomic theory? (1)

A. Aristotle supported the idea of discrete nature of matter
B. Democritus supported the idea of continuity nature of matter
C. ✓ **Democritus proposed the existence of atoms**
D. Aristotle proposed that matter is indivisible

> **Answer:** C
> Democritus was one of the earliest philosophers to propose that all matter is composed of small, indivisible particles called atoms. Aristotle, on the other hand, opposed this and believed in the continuous nature of matter.

53. Which one of the following list is among the indigenous units of measuring length? (1)

A. ✓ **Hand span**
B. Weqet
C. Meter
D. Square meter

> **Answer:** A
> Hand span is an ancient, traditional, and indigenous unit of length based on the distance from the tip of the thumb to the tip of the little finger on an outstretched hand, whereas Weqet is a unit of mass, and meter is a modern SI unit.

54. Out of the following which one is fundamental physical quantity? (1)

A. Area
B. Velocity
C. ✓ **Amount of substance**
D. Density

> **Answer:** C
> Amount of substance (measured in moles) is one of the seven base (fundamental) physical quantities in the International System of Units (SI), whereas area, velocity, and density are derived quantities.

55. When 2.25m is expressed in cm it will be _____? (1)

A. ✓ **225cm**
B. 22500cm
C. 2250cm
D. 22.5cm

> **Answer:** A
> To convert meters to centimeters, multiply by 100 (since 1 m = 100 cm). Thus, 2.25 m * 100 = 225 cm.

56. Suppose a time allowed for completing mathematics national examination for grade 8 is 2 hours. How much is this time in seconds? (1)

A. 120
B. ✓ **7200**
C. 240
D. 720

> **Answer:** B
> There are 3600 seconds in one hour (60 minutes * 60 seconds). Therefore, a 2-hour duration is equal to 2 * 3600 = 7200 seconds.

57. The accepted value of a certain body is 14kg. If the students measure with in a laboratory and obtained the results, 11.5kg, 11.49kg and 11.48kg, then the measurement is: (1)

A. Accurate not precise
B. ✓ **Precise not accurate**
C. Both precise and accurate
D. Neither accurate nor precise

> **Answer:** B
> The measurements (11.5 kg, 11.49 kg, 11.48 kg) are very close to each other, indicating high precision, but they are far from the true value of 14 kg, indicating low accuracy.

58. Which of the following sets of prefixes are arranged in increasing order? (1)

A. Mega, Kilo, Centi, Milli
B. Milli, Mega, Centi, Kilo
C. ✓ **Centi, Kilo, Mega**
D. Mega, Milli, Centi, Kilo

> **Answer:** C
> The metric prefixes in Centi (10^{-2}), Kilo (10^{3}), and Mega (10^{6}) are correctly arranged in increasing order of their numerical values.

59. Grade eight students wants to do an activity. They first take a candle fix it on a table and light the candle, the candle will continue to be burned due to the presence of oxygen. Which scientific investigation do the student confirm in their activity? (1)

A. Ask question
B. Formulating hypothesis
C. Performing background research
D. ✓ **Test the hypothesis by experiment**

> **Answer:** D
> Carrying out a physical activity or trial in a laboratory setting to see if a prediction holds true (e.g., seeing if a candle burns in the presence of oxygen) is the step of testing a hypothesis by experiment.

END OF THE MARKING KEY

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