KENYA NATIONAL EXAMINATION AND ASSESSMENT PREDICTION SERIES

ENDTERM 2 ASSESSMENT 2025

GRADE 9

INTEGRATED SCIENCE PP1

MARKING SCHEME

SECTION A (30 marks)

1. **A. Corrosive symbol**
2. **B.** Applying knowledge of biological processes and environmental science.
3. **D.** K, N, Ca
4. **D.** Iron and Water.
5. **B.** Sugar and water, and air.
6. **C.** Zinc and Sodium.
7. **C.** (i) solid, (iii) gas (Assuming standard diagrams where (i) is tightly packed and (iii) is widely dispersed)
8. **B.** Heat
9. **A.** Boiling the water and adding a water softener.
10. **B.** Milk fermenting and iron nails rusting.
11. **B.** Base for antacids, Acid for car batteries.
12. **C.** Growth of pubic hair.
13. **B.** (the fallopian tube/oviduct)
14. **B.** Engage in regular physical exercise and seek support.
15. **D.** (Kidneys)
16. **B.** Dermis
17. **C.** Bladder
18. **C.** Magnet
19. **B.** Electrical energy to light and heat energy.
20. **C**
21. **C.** Unplugging an appliance by pulling the plug itself, not the cord.
22. **B.** The magnets repelled each other.
23. **C.** Copper
24. **A.** Atomic Number: 17, Element: Chlorine (Cl)
25. **B.** Oxygen - used for respiration.
26. **C.** Chemical change has occurred.
27. **B.** Physical change, which is temporary.
28. **D.** Gonorrhea
29. **D 2.8.1**
30. **C.** The relationship between the cattle and the cattle egrets is commensalism, and the relationship between the cattle and the ticks is parasitism.

SECTION B (40 marks)

31. (a) (i) Identify two basic science skills applied in this activity. (2 marks)
    Measuring
    Observing
    Estimating
    Communicating (if they shared their findings) *(Any two of the above)*
    (ii) State the International System of unit (SI unit) of length. (1 mark) **Metre (m)**

32. (a) Is this a homogeneous or heterogeneous mixture? Give a reason. (2 marks)
Homogeneous mixture.
Reason: Ethanol and water are miscible and mix completely to form a uniform solution where individual components cannot be distinguished.
(b) Describe a suitable method the learners can use to separate pure ethanol from the water-ethanol mixture. (4 marks)
The suitable method is **fractional distillation.**
Procedure:
1. Pour the water-ethanol mixture into a round-bottom flask.
2. Connect the flask to a fractionating column, then to a condenser, and finally to a receiving flask.
3. Heat the mixture gently. Ethanol, having a lower boiling point (78°C), will vaporize first.
4. The ethanol vapor will rise through the fractionating column, condense in the condenser, and then collect as pure liquid ethanol in the receiving flask. Water will remain in the round-bottom flask.
(c) What separation technique would be used to obtain pure solid salt crystals from a salt solution? (1 mark) *
Crystallization or **Evaporation**

33. (a) A curious learner found an unknown clear liquid in the lab. They noticed it felt soapy to touch and turned red litmus paper blue. State the general physical properties of this unknown liquid, other than what is mentioned. (2 marks)
Corrosive/Caustic (It can cause burns or damage to skin/materials)
Bitter taste (Though tasting in a lab is unsafe, it's a general property of bases)
(b) Describe how you would prepare a plant extract from red cabbage to use as an acid-base indicator. (3 marks)
Chop red cabbage leaves into small pieces.
Boil the chopped cabbage in distilled water for about 10-15 minutes until the water turns a deep purplish color.
Filter the mixture to separate the liquid extract from the solid cabbage pieces. The resulting purple liquid is the indicator.

34. (a) A science teacher provided learners with a prepared temporary slide of a cheek cell and a prepared temporary slide of an onion epidermal cell.
(i) State two organelles that would be clearly visible in both cells under a light microscope. (2 marks)
Cell membrane
Cytoplasm
Nucleus *(Any two of the above)*
(ii) Describe the process of preparing a temporary slide of an onion epidermal cell for observation under a light microscope. (3 marks)
1. **Peel** a thin epidermal layer from the inner surface of an onion scale leaf using forceps.
2. **Place** the peel flat on a clean microscope slide.
3. **Add** a drop of water (or a stain like iodine solution) onto the peel.
4. **Gently lower** a cover slip over the peel, avoiding air bubbles.
(iii) Identify the following parts of a cell. (2 marks)
S: Smooth endoplasmic reticulum
T: mitochondrion
(b) Explain two roles of diffusion in living things. (2 marks)
i. **Gaseous exchange:** Diffusion allows for the movement of oxygen into cells and carbon dioxide out of cells in organisms (e.g., in the lungs, gills, or through the skin).
ii. **Absorption of nutrients:** Digested food molecules (e.g., glucose, amino acids) are absorbed from the digestive tract into the bloodstream by diffusion.
iii. **Excretion of waste products:** Metabolic waste products (e.g., urea) diffuse from cells into the blood to be transported to excretory organs.

35. (a) A person was rushed to the hospital complaining of severe pain during urination and the presence of pus in their urine. The doctor diagnosed them with a urinary tract infection affecting the bladder.
(i) Name the two main parts of the human urinary system responsible for producing and transporting urine to the bladder. (2 marks)

- **Kidneys** (produce urine)
- **Ureters** (transport urine from kidneys to bladder)

(ii) State one common cause of urinary tract infections. (1 mark)

- **Bacterial infection** (e.g., E. coli)
- **Poor hygiene**
- **Sexual activity**
- **Holding urine for too long**

(b) During a reproductive health class, the teacher explained the menstrual cycle.

(i) Name the two main hormones that control the menstrual cycle. (2 marks)

- **Estrogen**
- **Progesterone**
- *(Also acceptable: Follicle-Stimulating Hormone (FSH) and Luteinizing Hormone (LH) from the pituitary gland, which regulate estrogen and progesterone production)*

(ii) Briefly describe the process of implantation in human reproduction. (2 marks)

Implantation is the process where the **blastocyst** (early embryo) attaches itself to the wall of the **uterus** (specifically the endometrium) after fertilization. This typically occurs about 6-12 days after fertilization.

36. (a) A school dormitory caught fire due to a short circuit from faulty electrical wiring.

(i) What class of fire is this, and what type of fire extinguisher would be most appropriate to put it out? (2 marks)

Class of fire: Electrical fire (Class C)

Most appropriate extinguisher: Carbon Dioxide (CO_2) extinguisher or Dry Chemical Powder (DCP) extinguisher.

(ii) Explain two dangers posed by such a fire in a dormitory setting. (2 marks)

- **Rapid spread of fire:** Dormitories often contain highly flammable materials (beds, curtains, clothes) which can cause the fire to spread quickly, making escape difficult.
- **Smoke inhalation:** Burning materials produce toxic smoke, which can cause respiratory damage, suffocation, and disorient residents, hindering evacuation.
- **Structural damage:** Intense heat can weaken the building structure, leading to collapse.
- **Injuries/Fatalities:** Direct burns, falling debris, or inability to escape can lead to severe injuries or death.

(Any two of the above)

(b) State one method of fire control that involves removing the heat from a burning object. (1 mark)

Cooling (e.g., by spraying water)

37. (a) A village relies on energy sources for lighting and cooking. They currently use kerosene lamps and firewood. Suggest two alternative renewable energy sources that could be introduced to the village. (2 marks)

- **Solar energy** (for lighting and cooking via solar cookers)
- **Biogas** (from animal waste for cooking and lighting)
- **Wind energy** (for electricity generation)
- **Hydroelectric power** (if there's a suitable water source)

(Any two of the above)

(b) Explain the energy transformation that occurs when a hand-cranked generator is used to light a bulb. (2 marks)

Mechanical energy (from cranking the generator) is converted into **electrical energy** by the generator. This electrical energy is then converted into **light energy** and **heat energy** by the bulb.

Mechanical Energy ➡ Electrical Energy ➡ Light Energy ➡ Heat Energy

38. (a) Describe two physical properties that make steel a suitable material for construction, considering it is an alloy. (2 marks)
    i. **High tensile strength:** Steel can withstand significant pulling forces without breaking, making it ideal for structural support.
    ii. **Ductility:** It can be drawn into wires or shaped without breaking, allowing for versatile structural designs.
    iii. **Malleability:** It can be hammered or pressed into shape without breaking, useful for fabricating components.
    iv. **Hardness/Durability:** Steel is resistant to wear and tear, ensuring longevity in construction.
    v. **Corrosion resistance** (especially stainless steel): It resists rusting, crucial for outdoor structures.

    (Any two of the above)

    (b) Name the types of magnets shown below. (2 marks)

    A Bar magnet

    B): Horseshoe magnet

39. (a) A science learner was tasked with writing word equations for simple chemical reactions.

    (i) Write a word equation for the reaction where Carbon burns in Oxygen to form Carbon Dioxide. (1 mark)

    Carbon + Oxygen → Carbon Dioxide

    (ii) Write a word equation for the reaction between Magnesium and Oxygen to form Magnesium Oxide. (1 mark)

    Magnesium + Oxygen → Magnesium Oxide

    (b) An element has an electron arrangement of 2.8.1.

    (i) Name this element. (1 mark)

    Sodium

    (ii) Is this element a metal or a non-metal? (1 mark)

    Metal

40. (a) A farmer observes that the leaves of his maize plants are yellowing, and the growth is stunted despite adequate watering. Upon inspection, he notices that the underside of the leaves has fewer stomata than expected.

    (i) What process in plants is likely being affected by the reduced number of stomata? (1 mark)

    Transpiration (and subsequently photosynthesis, as less CO_2 might enter)

    (ii) Name the parts of a leaf shown below. (2 marks)

    N: Vein

    O: Midrib

    (b) During a biology lesson, learners were told that carnivores like lions have specific types of teeth for tearing meat. Name the type of teeth that are well-adapted for tearing. (1 mark)

    Canines

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