KENYA CERTIFICATE OF BASIC EDUCATION (K.C.B.E)

MARKING SCHEME

GRADE 10: METAL TECHNOLOGY – TERM 1 – JANUARY 2026

SECTION A (35 Marks)

1. Define the following terms:

a) **Material (1 mark)**

- ✓ Anything used to make a product or perform a task.
- ✓ Can be natural or synthetic.

b) **Metal Technology (1 mark)**

- ✓ The study of metals and how to shape, join, and finish them for practical use.
- ✓ It involves knowledge of tools, machines, and fabrication techniques.

c) **Machine (1 mark)**

- ✓ A device that helps perform work efficiently by using power or energy.
- ✓ Examples: drilling machine, lathe machine, grinder.

2. Personal Protective Equipment (PPE) examples (3 marks):
i. Safety goggles / eye protection
ii. Gloves / hand protection
iii. Apron / overall / protective clothing
iv. Ear muffs / ear plugs
v. Safety boots / shoes

3. First aid procedures for a cut from a hacksaw blade (2 marks):
i. Clean the wound with clean water / antiseptic
ii. Apply sterile dressing / bandage
iii. Apply pressure to stop bleeding
iv. Seek medical attention if deep

4. Businesses related to Metal Technology (3 marks):
i. Fabrication / welding workshop
ii. Metal furniture making
iii. Construction / metal roofing
iv. Tool and machinery repairs
v. Automotive bodywork / vehicle repairs

5. Components of a metal workshop layout (3 marks):
i. Working area / fabrication area
ii. Storage area for materials and tools
iii. Assembly / finishing area
iv. Safety zone / first aid area
v. Entrance / exit and movement paths

6. General workshop rules (3 marks):
i. Wear appropriate PPE at all times
ii. Keep the workplace clean and organized
iii. Do not operate machines without permission
iv. Report accidents immediately
v. Avoid horseplay / unsafe behavior

7. Causes of accidents when using machines (3 marks):
i. Carelessness / negligence
ii. Faulty or poorly maintained machines
iii. Lack of PPE or improper clothing
iv. Distractions or rushing the task
v. Improper training or supervision

8. Uses of metals in the community (3 marks):
i. Construction of buildings, bridges, and roads
ii. Manufacturing tools and machinery
iii. Fabrication of furniture and equipment
iv. Electrical wiring and appliances
v. Transportation – vehicles and parts

SECTION B (75 Marks)

9. Metal Workshop Safety and Accident Response

a) **Causes of accidents (8 marks):**
i. Slippery or cluttered floors
ii. Improper handling of tools and machines
iii. Lack of training / inexperience
iv. Ignoring safety instructions
v. Wearing loose clothing or jewelry near machines
vi. Faulty or poorly maintained machines
vii. Horseplay / distraction

b) **First aid for deep cuts (8 marks):**
i. Stop bleeding by applying pressure
ii. Clean the wound with antiseptic solution
iii. Cover with sterile dressing / bandage
iv. Seek medical attention / call nurse / inform teacher

c) **Importance of safety (6 marks):**
i. Prevents injuries and accidents
ii. Protects workers and students
iii. Ensures efficient workflow
iv. Reduces cost of damage and downtime

d) **Responsibility of workshop technician (3 marks):**
i. Ensure machines are properly maintained
ii. Monitor correct use of PPE
iii. Supervise learners while using machines
iv. Enforce safety regulations and protocols

10. Importance and Application of Metal Technology

a) **Reasons to study Metal Technology (4 marks):**
i. Develop practical skills for employment
ii. Learn to fabricate and repair metal products
iii. Encourage self-reliance and entrepreneurship
iv. Enhance problem-solving and innovation skills
v. Understand material properties and workshop safety

b) **Magnetic metals (4 marks):**
i. Iron
ii. Steel
iii. Nickel
iv. Cobalt

c) **Career opportunities (4 marks):**
i. Welder / Fabricator
ii. Blacksmith
iii. Metal technician / machinist
iv. Workshop instructor / teacher
v. Metal products designer

d) **Ways metal products support daily life (3 marks):**
i. Tools and equipment for farming / construction
ii. Household utensils and furniture
iii. Vehicles and machinery
iv. Electrical installations

e) **Reasons metals are preferred in construction (3 marks):**
i. Strong and durable
ii. Resistant to wear and tear
iii. Can be shaped and joined easily
iv. Conductivity and other useful properties

11. Metal Workshop Management

a) **Difference between:**
i) **Tools vs Machines (2 marks):**

- ✓ Tools are hand-operated (e.g., hammer, screwdriver)
- ✓ Machines are power-operated (e.g., lathe, drill)

ii) **Workshop vs Store (2 marks):**

- ✓ Workshop: area for fabrication and practical work
- ✓ Store: area for keeping materials and tools

b) **Factors for workshop layout (4 marks):**
i. Safety and accessibility
ii. Adequate ventilation and lighting
iii. Space for movement and machines
iv. Location of storage and emergency exits

c) **Tool identification (6 marks)**
A: Hacksaw
B: Cold Chisel
C: Ball Pein Hammer
D: Wire Strainer
E: Snips
F: Pliers

d) **Reasons PPE is essential (3 marks):**
i. Protects eyes, hands, and body
ii. Reduces risk of injury
iii. Complies with safety regulations

e) **Measuring tools (2 marks):**
i. Ruler / steel rule
ii. Vernier caliper / tape measure

12. Fabrication Workshop and Metals

a) **Blacksmith definition & metallic materials (3 marks):**

- ✓ A blacksmith is a person who shapes and forges metals using heat and tools.
  Metallic materials:
  i. Iron
  ii. Steel

b) **Properties of metals (8 marks):**
i. Malleable (can be hammered into shape)
ii. Ductile (can be drawn into wires)
iii. Strong and durable
iv. Conductive (electricity and heat)
v. Corrosion-resistant (for some metals)
vi. Lustrous / shiny

c) **Differences between ferrous and non-ferrous metals (6 marks):**
i. Ferrous metals contain iron; non-ferrous do not
ii. Ferrous metals are magnetic; non-ferrous are mostly non-magnetic
iii. Ferrous metals are prone to rust; non-ferrous are corrosion-resistant

d) **Metal identification (M, N, O)**

M: Bronze
N: Iron
O: Copper

e) **Proper handling & storage of materials (3 marks):**
i. Prevents accidents and injuries
ii. Reduces material damage and wastage
iii. Ensures organized workflow and efficiency

f) **Economic benefits of metalworking (2 marks):**
i. Provides employment and income
ii. Produces tools and products for community use
iii. Encourages local entrepreneurship

NOTE TO FACILITATORS (TEACHERS):

The marking scheme provided is not exhaustive. Facilitators are advised to use their professional judgment when awarding marks. Any correct, relevant, and scientifically or contextually acceptable answer that demonstrates understanding of the concepts should be credited. Where examples are required, learners may provide other valid examples apart from those listed in the scheme.

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