

PAPER 3
MARKING SCHEME
OCT/NOV2014

KENYA NATIONAL EXAMINATION COUNCIL
Kenya certificate of secondary education

BIOLOGY

Paper 3

MARKING SCHEME
(CONFIDENTIAL)

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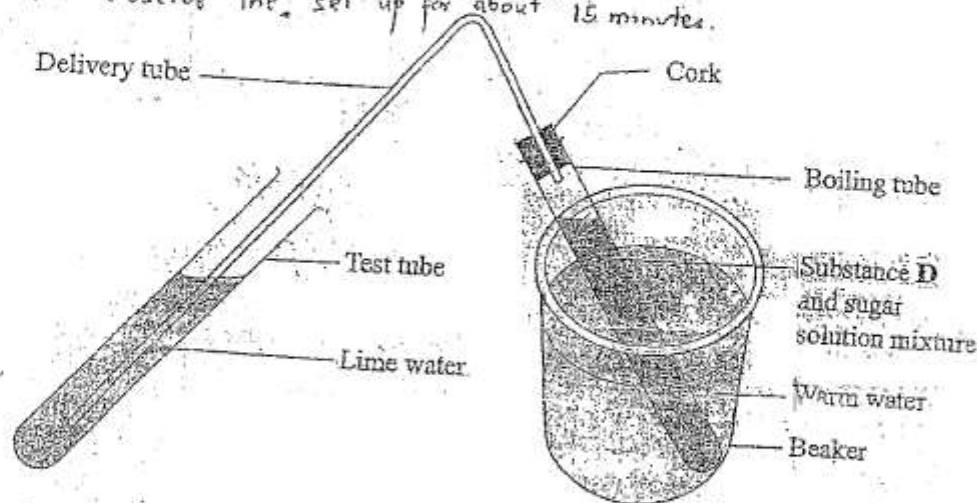
KCSE BIOLOGY

PAPER 3 PRACTICAL 231/3

11 (a) You are provided with solutions labelled Q and R, a substance labelled D and a delivery tube fitted with a rubber bung/cork.

- Label solution Q as lime water.
- Label solution R as 10% sugar solution.
- Add substance D to the 10% sugar solution.
- Tightly close/ plug the boiling tube with the rubber bung/cork fitted with a delivery tube.
- Dip the other end of the delivery tube in the test tube containing lime water.
- Put the boiling tube in the warm water bath at 40°C and allow the set up to stand as shown in the diagram below.

vii Observe the set up for about 15 minutes.



(i) State the observations made in the lime water.

(2 marks)

Bubbles / gas formed / effervescence

Lime water turns white / milky / cloudy / white ppt / white suspension

(ii) Explain the observations made in the lime water.

(2 marks)

Gas produced is carbon(IV) oxide / carbon dioxide / CO_2
 which reacts with Ca(OH)_2 (lime water) to form a (white ppt) / calcium carbonate / insoluble solid / compound

Diagram

lime water
 turns white
 milky / cloudy

-/ You are provided with specimens labelled E and F.

- (a) (i) Name the sub-division to which the specimens belong. (1 mark)

any spelt
to it
ve 1
wavy plant
character
closed
wavy

Angiospermophyta / Angiospermatophyta / Angiospermae

- (ii) Using observable features on the specimens, give two reasons for your answer in (a)(i) above. (2 marks)

E - presence of fruits / flanges / seed structures in fruits
F - presence of veins in leaves

- (b) State the differences between the

- (i) Leaves of specimens E and F. (5 marks)

	LEAF E	LEAF F
any five	ovate	lanceolate
	opposite	alternate
	not succulent	succulent / fleshy
	net veined	parallel veined
Teeth like	serrated / saw like	smooth / entire margin
many of colour	rough surface	smooth surface
colours	green	purple
	thin	thick
	broad	narrow
	has compound petiole / leaf stalk	

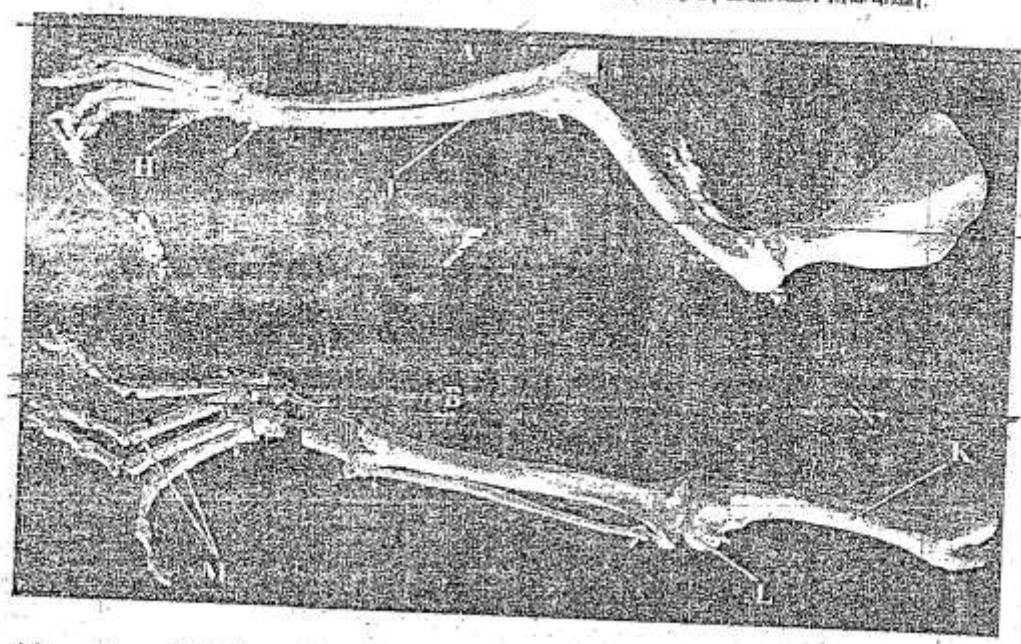
- (ii) Stems of specimens E and F. (2 marks)

	STEM E	STEM F
any two	leaf opposite	leaf alternate
any two	angular / cubical / rectangular / square	round / cylindrical / circular / round
	prickly / prickly / thorny / spiny / spiky	smooth / hairy
	woody / hard	herbaceous / soft
	green / grey	purple
		succulent / fleshy / juicy

- (c) Using observable features on the specimen, state the adaptation of the stem of specimen E to its habitat. (4 marks)

prickly / thorny / spiny / prickly for protection against browsers / animals / herbivores
hard / woody; for (mechanical) support

3 The photograph below shows two (A and B) skeletal limbs of a certain mammal.



(a) (i) Which of the two (A and B) skeletons represents a forelimb? (1 mark)

A

(ii) State two features observable on the skeleton to confirm your answer in (a)(i) above. (2 marks)

presence of scapula/shoulder blade
presence of olecranon process / ulna / radius / ulna and radius / humerus

(b) Name the bones labelled J, K and M.

J Radius ✓

(1 mark)

K Femur ✓

(1 mark)

M Metatarsal(s) ✓

(1 mark)

(c) Which bone forms the second joint with the bone labelled K?

(1 mark)

pelvic (girdle) bone / hip (bone/girdle)
innominate bone

✓ pelvis
✓ innominate

g. carbon
in plants

(iii) Name the physiological process that was being investigated:

(1 mark)

Respiration / anaerobic respiration / alcohol / fermentation
aerobic respiration

(iv) Write a word equation for the physiological process investigated.

(1 mark)

Glucose (sugar) + oxygen $\xrightarrow{\text{yeast / zymase}}$ Carbon (IV) oxide + water + energy

Anaerobic respiration / fermentation

Why was the warm water bath used in the experiment?

energy / ATP (2 marks)

acc: Ideal temp

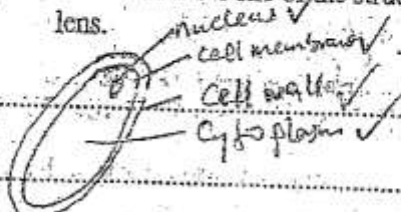
To provide optimum / best / most suitable temperature for enzyme activity / action / reaction / function

acc break down

b) Put a drop of the contents in the boiling tube on a microscope slide. Stain with a drop of methylene blue and cover with a cover slip. Observe it under a light microscope using low, medium and high power objective lenses.

(i) Draw and label one of the structures observed under the high power objective lens.

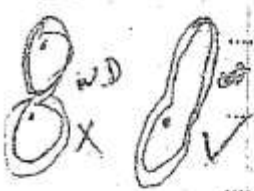
(3 marks)



labelled 1/2 max 2

- Continuous outline
- not wavy
- nucleus present
- Diagram oval / not round

g. if compass is used many cells are drawn



(ii) State the magnification of your drawing.

Eye piece mag x10 (1 mark)

g. x 400
if no drawing is made

x 200 - x 675

objective lenses x40, 45, 60, 65

(iii) State the identity of substance D.

(1 mark)

g. budding yeast
yeast cells

Yeast / yeast cell / yeast cells / yeast bud / yeast budding
yeast substance / granule / powder / yeast plant cell
yeast juice

(d) Name the type of joint formed at the part labelled H and L.

H Gliding (joint) / Sliding joint

(1 mark)

L Hinge (joint)

(1 mark)

(e) Apart from the bones, state the function of any two other components of a joint.

(4 marks)

Component

Function

Ligament ✓

attach a bone

Articular Cartilage ✓

Acts as a shock absorber / lubricates gliding / reduce friction

Synovial fluid

Lubrication / shock absorber / reduce friction / movement of tissues

Synovial membrane

secretes synovial fluid / encloses synovial fluid

NB! function is tied to component

wrong spelling of component, underlined and continue marking

✓ Synovial membrane encloses synovial membrane

- Synovial membrane contains synovial fluid

- Has synovial fluid