231/3
BIOLOGY
PAPER 3
PRACTICAL
JULY/AUGUST 2014

MWALA DISTRICT FORM IV JOINT EXAMINATION 2014
Kenya Certificate of Secondary Education
BIOLOGY
PAPER 3
CONFIDENTIAL

Each candidate requires the following

Solid x – 3g of powdered starch (provide pure soluble starch)

Solid Y – 3g egg albumen powder

2 boiling tubes

6 test tubes

10ml iodine solution

10ml benedict's solution

10ml 1% dilute sodium hydroxide solution

10ml 1% copper (II) sulphate solution

4 droppers

8 labels

Measuring cylinder 10ml

Stirring rod

Source of heat

Specimen A – black jack fruit

Specimen B – orange/lemon fruit

Specimen C – bean/pea pod

Specimen D – Sonchus species fruit

Knife/scalpel

Ruler 15cm

This paper consists of 1 printed page

Name_____ **Index No.** _____

Candidate's signature _____

Date _____

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JULY/AUGUST 2014
1 ¾ HOURS

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1 ¾ HOURS

INSTRUCTIONS TO CANDIDATES
1. Write your name and index number in the spaces provided above
2. Sign and write the date of examination in the spaces provided above
3. Answer all the questions in the spaces provided
4. You are allowed to spend the first 15 minutes of the 1 ¾ hours allowed for this paper reading the whole paper carefully before commencing your work
5. Additional pages must not be inserted

For examiner's use only

Question	Maximum score	Candidate's score
1	14	
2	14	
3	12	
Total score	40	

This paper consists of 5 printed pages

Turn over

1. You are provided with two solids X and Y. Place solid X into a boiling tube and add 10ml of distilled water and stir to dissolve. Label the resulting mixture as solution X. Divide the solution X into equal portions in three test tubes all labeled A, each of which will be used for a food test in the table below. Place solid Y into a boiling tube and add 10ml of distilled water and stir to dissolve. Label the resulting mixture as Y. divide the solution Y into equal portions in three separate test tubes all labeled Y, each of which will be used for a food test in the table below.

(a) Using the reagents provided carry out food tests to determine the food substances present in solutions X and Y in each of the test tubes. In each case, record the food substance tested for, procedure, observation and conclusion in the table below. (9mks)

Solution	Food substance	Procedure	Observation	Conclusion
A				
B				

(b) (i) Which of the two solids would be appropriate to be included in a diet of a family whose children suffer from kwashiorkor (1mk)

_____

_____

_____

(ii) Give a reason for your answer in b (i) above (1mk)

_____

_____

_____

(c) (i) Name the part of the digestive system where digestion of the food substance (s) found in y starts (1mk)

_____

_____

_____

(ii) Name the enzyme which starts the digestion of the food substance(s) in y (1mk)

_____

_____

_____

(d) State one importance of the food substance in solid X (1mk)

_____

_____

_____

2. You are provided with specimen labeled A, B, C and D. Examine them

(a) Make a transverse section of specimen B. Draw and label the section as observed (5mks)

(b) Giving reasons, state the agent of dispersal of the specimens (8mks)

Specimen	Agent	Reason(s)
A		
B		
C		
D		

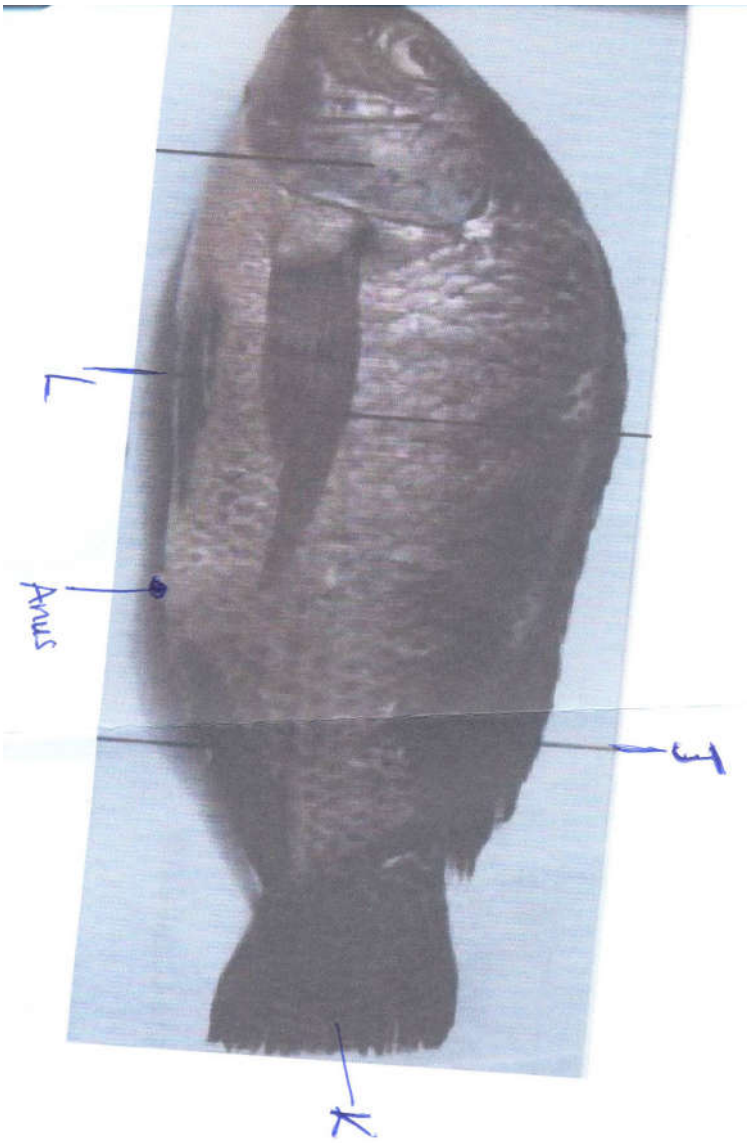
(c) State the placentation of specimen B (1mk)

_____

_____

_____

3. Study the photograph below and answer the questions that follow



(a) (i) Name the class to which the specimen belongs (1mk)

_____

_____

_____

(ii) Give two reasons for your answer in a (i) above (2mks)

_____

_____

_____

_____

(b) (i) What term is used to describe the shape of the specimen (1mk)

_____

_____

_____

(ii) What is the significance of your description in b (i) above (1mk)

_____

_____

_____

(c) Measure in millimeter the length of

(i) Specimen from tip of the mouth to the tip of the tail

Length _____mm_____ (1mk)

(ii) From the anus to the tip of the tail

Length _____mm _____ (1mk)

(ii) Using the measurement above, calculate the tail power (2mks)

_____

_____

_____

_____

(d) Name the parts labeled J, K, L (3mks)

J _____

K _____

L _____

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MARKING SCHEME

1.

Solution	Food substance	Procedure	Observation	Conclusion
X	Starch	Put $2cm^3$ of substance x into a test tube labeled A. Add three drops of iodine solution and shake;	Colour changes to blue black	Starch present;
	Reducing sugar	Put $2cm^3$ of food substance X into a test tube labeled A. Add two drops of Benedict's solution and heat the mixture to boil;	No colour change/ the colour of benedict's solution persists/remain blue;	Reducing sugar absent
	Proteins	Put $2cm^3$ of food substance X into a test tube labeled A. Add equal amount of sodium hydroxide solution and shake. Add copper (ii) sulphate solution and shake;	No colour change/blue colour of copper (II) sulphate persists;	Proteins absent;
Y	Starch	Put $2cm^3$ of food substance Y in a test tube labeled B. Add 3 drops of iodine solution;	No colour change/colour of iodine solution persists;	Starch absent
	Reducing sugar	Put $2cm^3$ of food substance Y in a test tube labeled B. Add two drops of Benedicts solution and heat the mixture to boil;	No colour change/colour of benedict's solution persists;	Reducing sugar absent;

	Protein	Put $2cm^3$ of food substance Y into a test tube labeled B. Add equal amount of sodium hydroxide solution. Add copper (II) sulphate solution while shaking	The colour changes to purple	Protein present

Conditions for marking food test

(a) (i) Reject procedure, hence observation and conclusion if:
Food substance tested is wrong
Name of reagent(s) is included in the column for food substance
The procedure is wrong
Spelling of reagent(s) is wrong
Incorrect chemical formula of a reagent is used in procedure
(ii) Reject conclusion if observation is wrong
(iii) For solid X give one mark for each correct food substance, procedure, observation and conclusion
(iv) For solid Y. award equivalent (///) for correct food substance and procedure; then give one mark for each correct observation and conclusion

Total marks $^{18}/_{2}$ = 9mks

(b) (i) Solid Y;
(ii) Solid Y is rich in proteins
(c) (i) Stomach;
(ii) Pepsin;

(d) Hydrolysed and oxidized to release energy;
Storage form of carbohydrates in plants;

Mark the first point only.

2. (a)

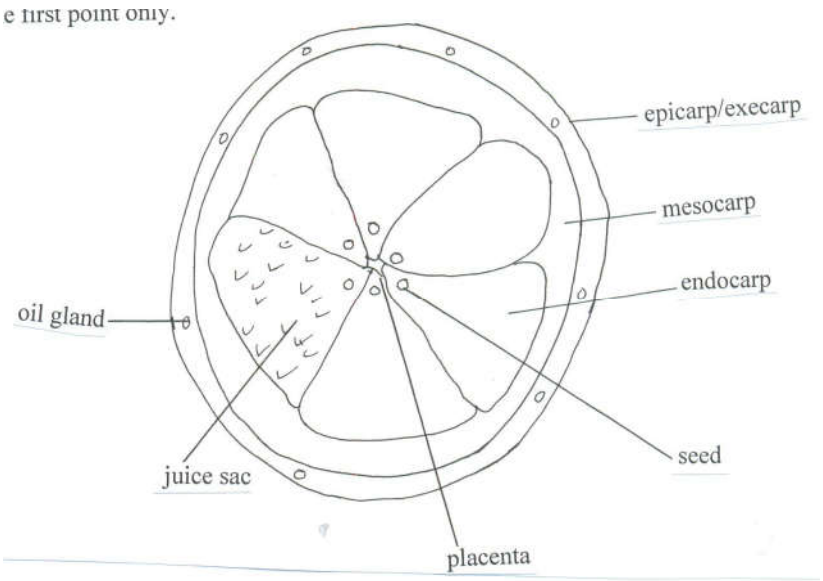

Diagram marking:
(i) Drawing mark (1)
- No shading
- Continuous out line
- Proportionality
- Correct shape/Actual specimen

(ii) Magnification (1mk)

Evidence of measurement and calculation

$$\frac{\text{Drawing length}}{\text{Length of real specimen}} = \text{magnification}$$

X – before the figure must be present
- If the mg has units- Deny the mark

(iii) Label marks
- Conditions;
- Mark only three correct labels. Marking to be done clockwise from a vertical axis
- Names must be spelt correctly
- A line and not arrow must be used
- The line should touch the part labeled
- Line should never cross each other, if they do both labels are wrong
- If two parts are labeled similarly both are wrong
- If two lines touch the same part both labels are wrong

(b)

Specimen	Agent	Reason(s)
A	Animal	Has hooks; which attach on skin/clothes of animal/man
B	Animal	Fleshy/succulent hence edible, brightly coloured to attract animals (if ripe lemon/orange are provided. It is scented/has good smell which attract animals
C	Self explosive mechanism	Presence of sutures/lines of weakness
D	Wind	Small and light; has pappus of hair which increase surface area to be easily carried by the wind

(b) Marginal placentation;

3. (a) (i) Pisces; rej wrong class and hence reject the reasons
Rej wrong spelling and continue marking the reasons
(ii) Presence of fins; operculum, scales, lateral line
Mark the first two reasons

(b) (i) Streamlined body;
(ii) To reduce friction in water;

(c) (i) 203mm + 1mm;
(ii) 85mm + 1mm;
(iii) $\frac{\text{Length from anus to tip of tail}}{\text{Length from mouth tip to tail tip}} \times 100$

$\frac{85}{203} \times 100;$

$= 41.87\%;$

(d) J – Dorsal fin;
K – Caudal fin;
L – Pelvic fin;