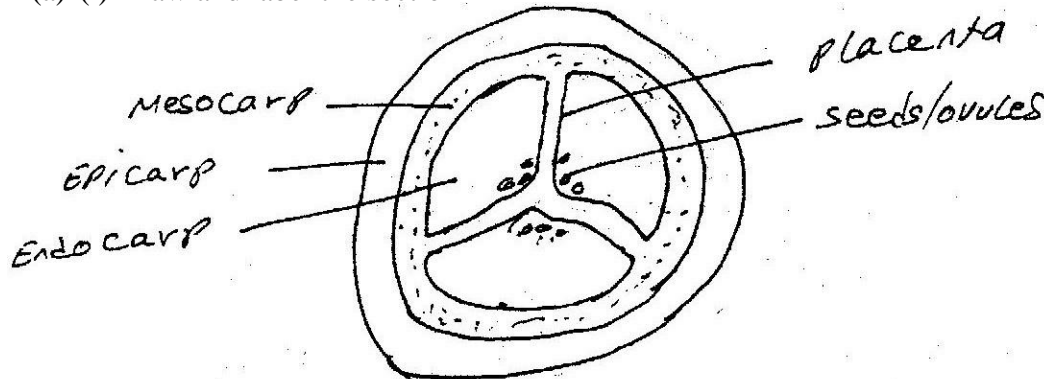


**BIOLOGY PAPER 231/2 K.C.S.E 1997
PRACTICAL MARKING SCHEME**

1. Confidential Requirement specimen Q- Ripe banana

You are provided with a specimen labeled Q. Make a transverse section of the specimen.

(a) (i) Draw and label the section



(ii) Work out the magnification of your drawing

$X \frac{1}{2} - X3$

$Mag = \frac{\text{Size of diagram}}{\text{Size of object}} = X \frac{1}{2} - X3$

(b) What type of fruit is specimen Q?

Freshly/simple/berry/succulent

(c) Slice off about 2cm thick disc from the specimen. Peel it. Place piece into a beaker and mash it into paste using a glass rod. Add 20ml of distilled water and stir. Tie one end of the transparent tubing provided. Decant the extract into the tubing and tie the other end tightly.

ENSURE THERE IS NO LEAKAGE AND BOTH ENDS OF THE TUBING
Rinse the outside of the tubing with water. Immerse the tubing with its content in 100ml beaker containing iodine solution. Allow standing for 20 minutes.

(i) Record your observations in the table below.

	Extract inside tubing	Iodine solution Outside tubing
Before the experiment	Cream/white/cream white/pale yellow/ light yellow Rej. Yellow	Colour of iodine Yellow/brown Reddish brown/ orange
After the experiment	Blue + Black/ blue Black Rej purple	As above no colour change

(ii) Account for the results obtained in c (i) above

Iodine/ dissolved/ entered and reacted with starch concentration

Gradient

Reaction

Extra mole cannot come out- too large to diffuse out.

2. Below is a photograph of a dissected mammal. Study the photograph and answer the questions that follow



(a) Name the structures labeled

S1 - Oesophagus/gullet/trachea

S3 - Lungs

S4 – Gal bladder/ liver

S7 – Kidney

S9- Ovary/uterus/womb

S10- Uterus/ womb

S12 – Caecum

S13- Colon/ large intestine/ileum/small intestine

S14- Stomach

S15- Liver

S16 – Heart

S20- Tongue/ mouth

(b) (i) state the functions of the structure labeled

F1 – Bladder; storage of urine/holding/ keeping

F2- Hepatic portal vein/bile duct; transport of digested food into the liver

- Transport of bile juice/ salts to duodenum

(ii) With reasons, state the sex of the dissected mammal

Sex- Female

Reasons – Ovaries/ pregnant/fallopian tubes/ uterus present.

(c) (i) Name the dissecting tool placed at the anterior end of the mammal

- Forceps

(ii) State the use of the tool during a dissection

Holding tissues during dissection/ lifting/ caching/ pulling parts in place/
removing parts.

(d) The actual length of the tool you have named in c(i) is 15cm. Measure the actual length of the tool in the photograph and calculate the magnification of the photograph.

Length of the tool in the photograph; 4.5 to 5 cm

= Length of the tool

Actual length of the object

$$\frac{4.5}{15} = 0.3 = \times 0.3$$

Magnification of the photograph

Length of diagram/ photo

Length of object

$$\frac{4.5 \text{ cm}}{15 \text{ cm}} = 0.3 \text{ mag}$$

3. You are provided with specimens P1, P2, P3, P4, P5, P6, P7, P8, P9 and P 10

Below is a dichotomous key, which can be used to identity specimen P1 – P9.

(a) Identify the specimens using the key. Indicate the steps followed to identify each specimen.

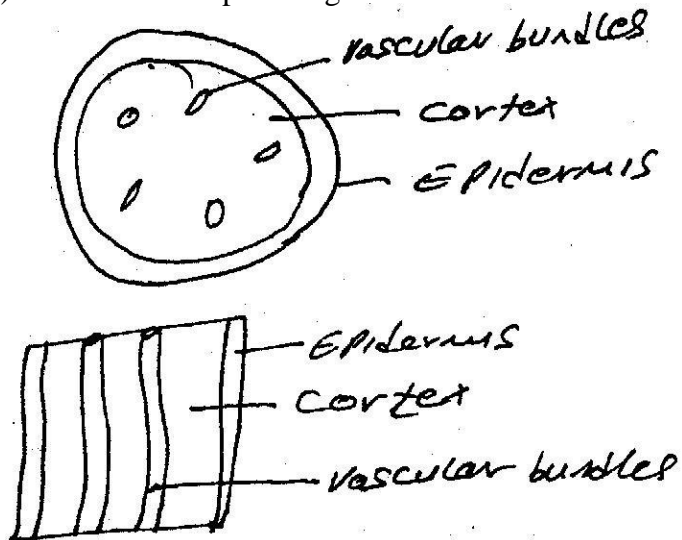
1 a; Leaf simple	go to 3
b; leaf compound	go to 2
2 a; Leaf lobbed	Oxalidaceae
b; Leaf with unlobbed leaflets	go to 8
3 a; Leaf parallel veined or with a spine	go to 4
b; leaf net- veined	go to 6
4 a; leaf succulent	go to 5
b; Leaf not succulent	Graminae
5 a; Leaf with sheath	Commelinaceae
b; leaf without sheath	Agavaceae
6 a; leaf rough on the upper surface	go to 9
b; leaf surface smooth or hairy	go to 7
7 a; leaf surface smooth	Anacardiaceae
b; Leaf surface hairy	Solanaceae
8 a; leaflets margins serrated	Compositae
b; leaflets margins smooth	Mimosaceae
9 a; Leaf surface not spiny	Verbanaceae
b; Leaf surface spiny	Rosaceae

Specimen	Identity	Steps Followed
P1	Commelinaceae	1a, 3a, 4a, 5a
P2	Compositae	1 b. 2b, 5a
P 3	Anacardoceae	1a, 3b, 6b, 7a
P4	Mimosaceae	1b, 2b, 8b
P5	Solanaceae	1a, 3b, 6b, 7b
P6	Oxalidaceae	1b, 2c
P7	Agavaceae	1a, 3a, 4a, 5b
P8	Verbanaceae	1a, 3b, 6a, 9a
P9	Graminae	1a, 3a 4b

Wrong steps, wrong identity no mark

- (b) Using a razor blade, make a thin section of the petiole of specimen P 10.
Stain the section methylene blue and mount on a microscope slide
Observe using the hand lens

(i) Make a labeled plan diagram of the section



(ii) From your observations of the section, to which class does the specimen belong?

Class Dicotyledonous – rej. Dicot and cotyledon

Reason Vascular bundles arranged in a ring/ circle/ vascular bundles is on either side of pith/distinct cortex.