

**BIOLOGY PAPER 231/2 K.C.S.E 2000  
PRACTICAL MARKING SCHEME**

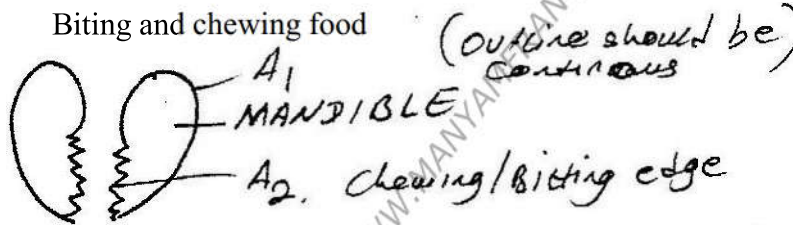
- 1 (a) You are provided with a specimen labeled D
- (i) Name the specimen to which the specimen belong Arthropoda
- (ii) State three characteristics found in the members belonging to the phylum
- presence of exoskeleton/ Ectoskeleton
  - Jointed limbs/ appendages/ legs
  - Segmented body parts

- (b) (i) Name the class to which the specimen belongs  
Insecta

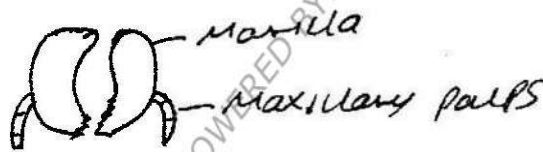
- (ii) State four characteristics found in the members of class
- Body divided into three ( head, thorax, and abdomen)
  - Three pairs ( six legs)
  - One pair ( 2 antennae)
  - Presence of spiracles/ breath through spiracles
  - Compound eyes ( one pair)

- (c) Remove, draw, and label the mouth parts used for:

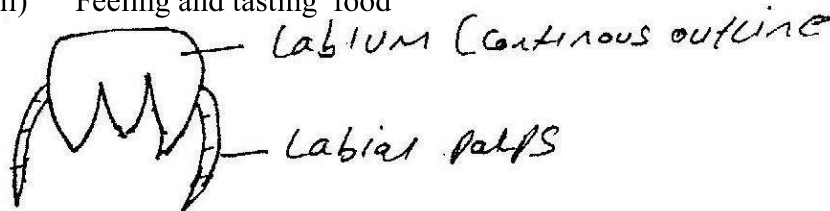
- (i) Biting and chewing food



- (ii) Hold food



- (iii) Feeling and tasting food



- (d) Examine the wings of the specimen. State the differences between them.

Forewing/outer wing

- Hard
- Narrow/ small surface/ small
- Stiff/ rigid/ inflexible
- Opaque

Hind wing/ Inner wing

- Soft/ Membranous
- Wide/ broad/ large surface area
- Flexible/ can fold
- Translucent

## 2. Confidential requirements:

### Specimens:

**G- onion bulb (Sprouting) E- Taproot/Taproot tuber/ swollen tap root/main root/Carrot root hairs/ F- stem tuber**

You are provided with specimens labelled E, F and G.

(a) With reasons state which part of plant are specimens E, F and G.

E- carrot root hairs

### Reasons

- Presence of lateral roots
- Short stem. Swollen with food

F- Irish Potato

### Reasons

F- Stem tuber

- Presence of lateral buds/ auxiliary/ auxiliary buds
- Presence of scale leaves
- Swollen with food

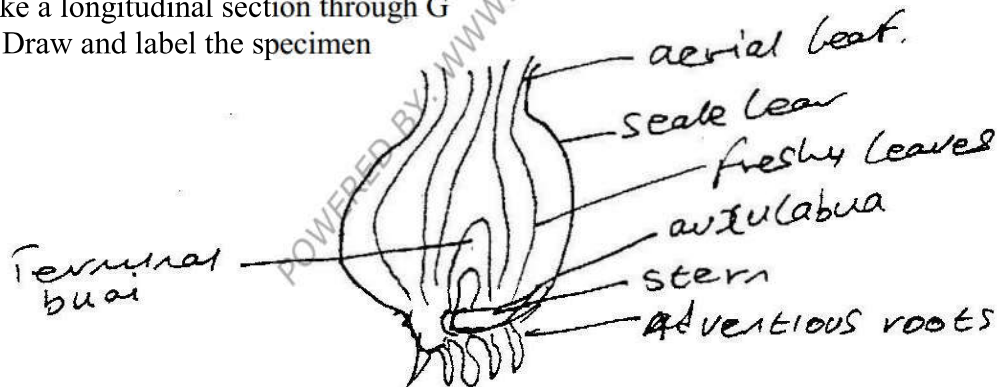
G- Bulb/ Onion bulb/ Onion plant bulb

Reasons

- Scale leaves / scaly leaves
- Short stem/ flattered stem
- Fleshy leaf bases/ leaves swollen with food.

Make a longitudinal section through G

(b) Draw and label the specimen



(c) (i) name the vitamin present in specimen E

Vitamin A retinal

(ii) What are two functions of the vitamin named in (c) (i) above.

- Protein of skin and cornea form dying
- Synthesis of Rhodopsin pigment
- Improves night vision/ vision in poor light

(d) State three differences in specimen F and G

F

- Food stored in stem
- Swollen stem
- Rudimentary/ not well Developed scaly leaves
- Small/ inconspicuous scale leaves
- Absence of adventitious roots

G

- Food stored in leaves
- small short/flattened stem
- Dry papery/ well developed scale leaves
- Presence of adventitious roots

3. You are provided with a substance labelled H. Filter the substance and collect filtrate. Filtration is expected to be complete after about 30 minutes. Using the reagents provided, test for the food substances in the residue and the filtrate. Record your procedures, observations and conclusions in the table below.

**Residue**

Food substance	procedure	Observations	Conclusion
starch	Add a drop of iodine	Colour of iodine/yellow/ orange/ brown/ reddish brown / no colour change	Starch absent
proteins	Add NaOH then a drop of 1% CuSO <sub>4</sub> and shake	Purple violet colour	Presence of proteins
Reducing Simple sugars	Add benedict's solution and heat in warm water bath	Green colour/ yellow/Orange/ red/brown/ colour	Traces of reducing sugar of colour change is greenish. Reducing/ Simple sugars present

**Filtrate**

Food Substance	Procedure	Observations	Conclusion
Starch	Add a drop of iodine	No colour change/colour of iodine/ yellow/ brown/ orange/ reddish brown colour	No starch present
Protein	Add NaoH then CuSO <sub>4</sub> and shake	Blue colour/ light blue/ No colour change/ Colour of copper sulphate retained. Purple colouration	Absence of proteins or presence of proteins according to observations
Reducing/ simple sugars	Add Benedict's solution and heat/ place in a warm water bath	Green/ yellow/ orange / red/ brick red ppt	Greenish colouration Traces of reducing/ simple sugars