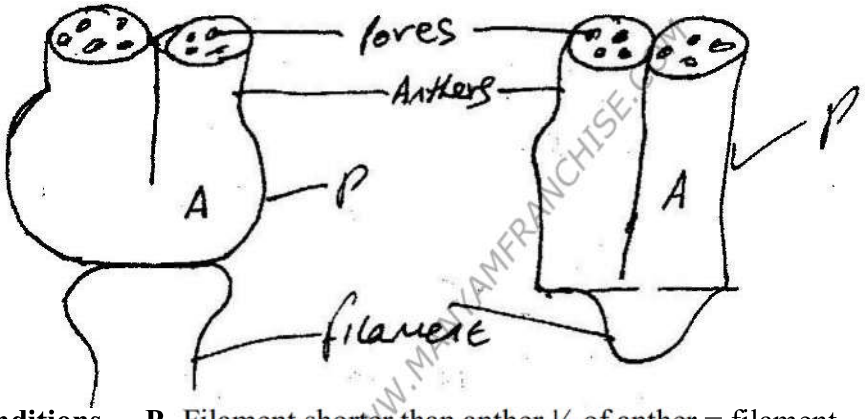
BIOLOGY PAPER 231/2 K.C.S.E 1998
PRACTICAL MARKING SCHEME
Confidential requirement: Specimen M- Solanum (Sodom apple), Specimen N – Hibiscus rosanensis

1. You are provided with specimen labeled M and N. Examine them.

(a) Describe the arrangement of the stamens in specimens M and N.
M- Stamens; five in number arranged around/ arising from free/separate/lease of ovary/corolla/anthers below stigma
N- Many numerous stamens; filaments/ fused; to form a (common) stigma (tube) stamen below stigma.

(b) Carefully remove one stamen from specimen M. Examine it using a hand lens. Draw and label it.



Conditions **P-** Filament shorter than anther ¼ of anther = filament
A- All parts to be drawn; continuous lines

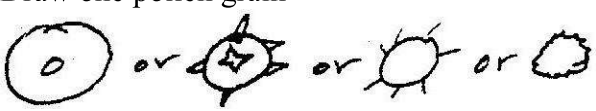
(c) Remove another stamen from specimen M. Cut the anther transversely into two equal parts. Tap the pollen grains from the lower half onto a microscope slide. Add a drop of iodine. Place a cover slip and press on the cover slip gently to spread out the pollen grains. Observe the pollen grains under medium power.

Draw one pollen grain.

State the magnification

(d) Remove an anther from specimen N. Place it on a microscope slide. Add a drop of iodine. Cover with a cover slip. Press gently on the cover slip to spread out the pollen grains. Observe the pollen grains under medium power.

Draw one pollen grain



State the magnification X 100

(e) State two observable differences between the corolla of specimen N and M

M- Smooth and small/ smaller

N- Rough/ Spiked and larger/larger

(f) State four observable differences between the corolla of specimen M and N

M- Petals fused – gamopetalous	**N-** Free petals/ verlapping/corolla Polypetalous
M- Small corolla	**N-**Corolla large/ broad
M- Petals pointed tips	**N-** Petals rounded tips
M- Nectar guides not easily	**N-** Nectar guides noticed

2. Confidential requirement: Solution L- Diastase/amylase

You are provided with a solution labelled L, starch solution and sodium chloride in two different concentration 0.1% and 1.4%. Place 3ml of starch solution in test tubes labelled 1,2 and 3. Add 3 drops of 0.1% sodium chloride to the test tube labelled 3.
Add 3 ml of solution L to each test tube labelled 2 and 3

(a) Place a drop of the contents from each test tube 1,2 and 3, on a white tile. To each drop add iodine solution. Record your results in the table below.

Test tube	Observation at start of experiment	Observation at end of experiment
Starch 1	Blue – black Blue/black/dark blue	Blue- black/blue/black/dark blue
Starch + 0.1% NaCI + L.2	Blue black as in TI	Retained the colour of odine/yellow/brown/reddish/orange Acc. Traces of blue **Rej. Red**
Starch + 1.4% NaCI + LI. 3	Blue black as in TI	Retained iodine colour as in T2

(b) Place the test tube in water bath maintained at 37^0C. Allow to stand for 30 minutes. Place a drop f the contents from each test on a white tile. To each drop add iodine solution. Record your observations in the table.

(c) Add equal amounts of Benedict's Solution in test tubes labelled 2 and 3 boil. Record your observations

Test tube 2

Changed to green/ yellow

Test tube 3

Colour changed to orange/ brown/ red/reddish/brick red

(d) Why was the test tube labeled 1 included in the experiment?

Control experiment

(e) Account for the results in test tube 1,2 and 3 at the end of the experiment.

- Starch converted/ hydrated/digested/broken down; sugars/reducing/glucose and maltose. In test tubes 2 and 3
- Starch was not converted into reducing sugars, in test tube 1; due to lack of NaCI and enzyme (sol-L)
- More reducing sugar in test tube 3 than H_2; due to high concentration of NaCL in H_3
- NaCI accelerates digestion/ hydrolysis of starch.

(f) Suggest the Identity of solution L
Enzyme /diastase /amylase /ptyalin..

(g) Why were the test tubes placed in a water bath maintained at 37^0 C? Provide optimum temp/best temp/for enzyme activity. (Ideal / most suitable.

3. Confidential requirements: Specimen R- Housefly, Specimen S- Bee.

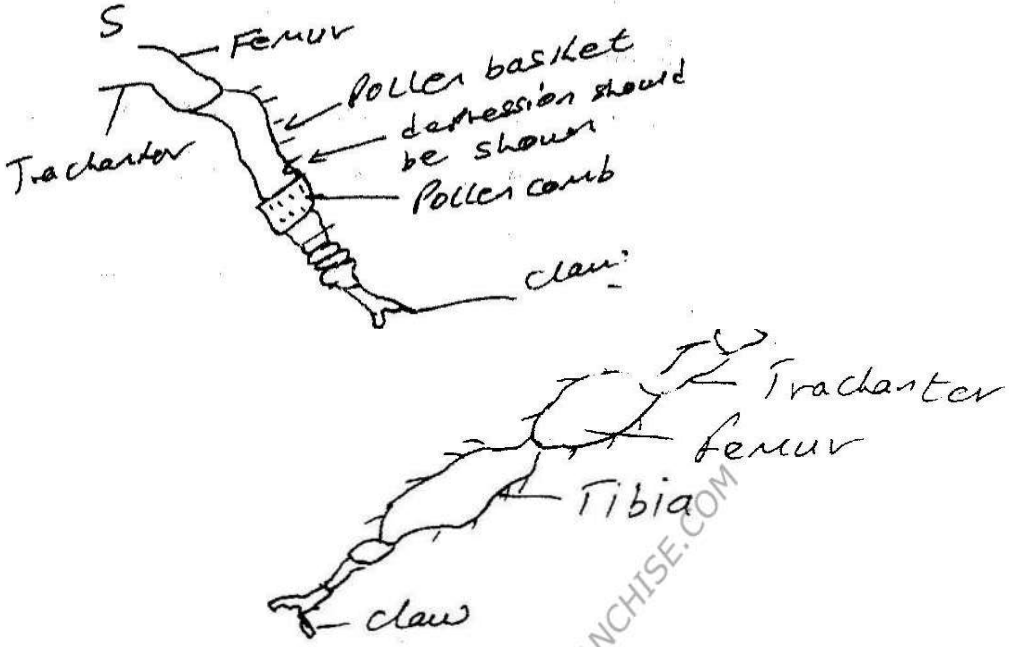
You are provided with specimens labeled R and S. Examine them.

(a) (i) Name the phylum and the class to which the specimens belong
Phylum……Arthropoda
Class…… Insecta
(ii) State two distinguishing features found in the members of

Phylum …… Presence of exoskeleton
Joined/appendage/limps
Class…….. 3 pairs of legs/ six legs
3 body parts/ namely hand, thorax, abdomen.

(b) State two differences between the wings of specimen R and S
S…….. 2 pairs
Absence of halteres/ hind wings
R……1 pair of wings
Has halteres/ hind wings
Modified wing

(c) Remove one whole hind legs from specimens R and S.
Draw and label them.



(d) Draw and label the front view of the head of specimen S.