

BIOLOGY

SUBJECT 9190

PAPER 4

GENERAL COMMENTS

It was generally agreed upon by the examiner that the level of difficulty in this paper was the same as those of previous sessions. Therefore any shifts on the overall performance of candidates can only be attributed to the caliber of the candidates and their (un)preparedness for this particular examination. Another contributory factor could be the staff-turnover in most centres.

The examiner is, however, pleased to note that some candidates, though very few, did exceptionally well in this component.

COMMENTS ON INDIVIDUAL QUESTIONS

QUESTION 1

- (a) The majority of candidates lost marks here, not because they did not know the iodine test for starch, but because they used wrong procedures in designing their experiments. About 70% of the candidates made the mistake of adding iodine solution into the test-tubes containing the starch-amylase mixture, when they were expected to mix **known** or **stated** volumes of starch and amylase solutions, extract **stated** volumes of the resolution mixtures and do the iodine test on the white tiles provided time intervals. The majority of candidates also ignored the concept of **precautions** taken to make valid conclusions, which included ...
- (b)
- (c)
- (d)
- (e) In Biology, the concept of dependent and independent variables must be emphasized when plotting graphs. Percentage concentration of amylase being the independent variable in this investigation must have been on the x-axis. Also, axes must be labelled fully, and units included where applicable.

Other candidates lost marks for drawing lines of best fit and extrapolating. This must be discouraged.

- (f) The weak candidates gave general statements here. There was no evidence of application of biological knowledge. Instead of giving an account, only descriptions were given and in the majority of cases, no reference to the graph as made.
- (g) A common response here was simply to mention use of different temperatures without being specific on the temperatures used. Again, candidates were expected to explain, and not simply to describe. Only one enzyme concentration was supposed to be used here, not all **Z1**, **Z2** and **Z3**. Simply to state use of room temperature, optimum and boiling temperature was not correct.

QUESTION 2 (a)

- (i) Marks were lost here for drawing incomplete onion cells. Although nothing was mentioned about the size of the cells to be drawn, candidates should be encouraged to use almost all the space which is available when making drawings. The variables were to be seen under the light microscope but these were drawn by most candidates. The nuclei which were visible were omitted by some candidates. The shapes of the onion cells were also wrongly represented. Shading, broken pencil lines and stippling must be totally discouraged.
- (ii) Explanations, not descriptions, were given. The position of the nucleus was rarely mentioned.

QUESTION 3

This was the most failed question in the examination.

- (a) The making of plan drawings must be emphasized when teaching aspects of microscopy. Some weak candidates attempted to represent all the individual cells. Others drew only one segment of the leaf. Those candidates who drew all 3 segments did not represent the proportions of the different tissues accurately. They did not bother to count how many tissues there were in the section.
- (b) Many candidates were not able to identify that **Z1** was round/circular in shape, a feature which helps to reduce surface area available for evapotranspiration. Candidates were required to mention **visible features** only, and such features should enable **Z1** to live in the environment where it is found.

- (c) The good candidates could suggest a suitable habitat for **Z1**, but could not fully explain how the features mentioned in 3 (b) make **Z1** better adapted to that habitat. A common response was **Z1** is an aquatic plant, when the opposite is true.