

S.6 BIOLOGY ASSIGNMENT

Paper 2

INSTRUCTIONS

Answer all questions in both sections A and B.

Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically, illustrating with well labelled diagrams where necessary.

SECTION A

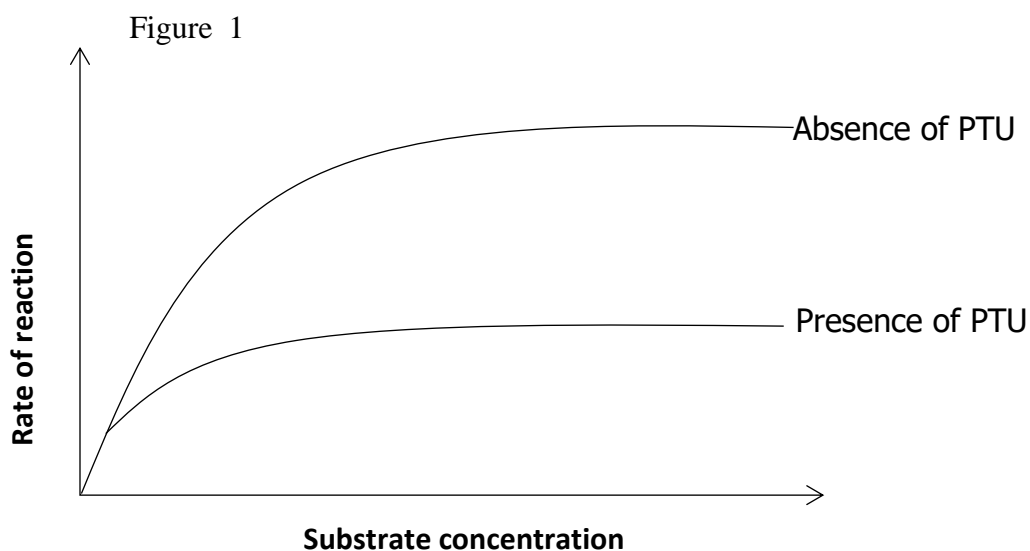
1. When plant cells are disrupted, they release the enzyme Phenoloxidase that leads to oxidation of colourless Phenols into coloured products. In an experiment, sample of an extract containing Phenol oxidase were obtained from plant tissue and then subjected to various treatments after which they were then mixed with a solution of Phenol buffered at PH7 and incubated at 35°C for 10minutes. The Pre-treatment and results are shown in table 1.

Table 1

Test tube	Pre-treatment of enzyme extract	Colour of extract after incubation with Phenol
A	None	Intense brown
B	Incubation with protease for 10 minutes	Colourless
C	Mixed with trichroacetic acid for 5 minutes	Colourless
D	Mixed with mercuric chloride for 5 minutes.	Very light yellow

In some further experiment, samples of some enzyme extract were mixed with different substrate concentrations, in the presence and absence of a stand solution of Phenylthiourea (PTU)

Figure 1 shows the results obtained in relation to rate of reaction.



- (a) Describe the effect of the Pre-treatments on the final colour of the extract after incubation. *(04 marks)*
- (b) Explain the colour of the extract after incubation with Phenol in
- (i) tube **A** *(04 marks)*
 - (ii) tube **B** and **C** *(05 marks)*
 - (iii) tube **D** *(04 marks)*
- (c) Suggest why each of the following were done.
- (i) incubating the mixture at 35°C *(03 marks)*
 - (ii) using a buffered mixture. *(05 marks)*
- (d) Compare the rate of reaction in the presence and absence of PTU. *(05 marks)*
- (e) Explain the effect of each of the following on the rate of reaction.
- (i) absence of PTU *(06 marks)*
 - (ii) presence of PTU *(05 marks)*
- (f) Suggest two precautions that could have been taken to ensure reliable results. *(02 marks)*

SECTION B

2. (a) Compare gaseous exchange in the bony fish and man. *(12 marks)*
- (b) Explain how mammals get rid of their different non-nitrogenous wastes. *(08 marks)*
3. (a) What is meant by the terms **Photosynthetic** and **oxidative phosphorylation** *(04 marks)*
- (b) Compare Photosynthetic Phosphorylation with oxidative phosphorylation. *(13 marks)*
- (c) Suggest evidence for a **two** stage procession in Photosynthesis. *(03 marks)*
4. (a) Describe the role of the Proximal convoluted tubules in the functioning of the kidneys. *(08 marks)*
- (b) Explain how the;
- (i) secretion of aldosterone is controlled. *(07 marks)*
 - (ii) nephrone regulates blood PH. *(05 marks)*
5. (a) What is meant by **rigor mortis**? *(04 marks)*
- (b) How;
- (i) is a voluntary muscle tissue adapted to its function? *(07 marks)*

- (ii) does a muscle contract when stimulated? *(09 marks)*
6. (a) Differentiate between **artificial** and **natural selection**. *(06 marks)*
(b) Explain the role played by each type of selection in the evolution of species. *(14 marks)*
7. (a) What is meant by **chemosynthesis**? *(03 marks)*
(b) Compare photosynthesis in purple sulphur bacteria with that in a higher plant. *(07 marks)*
(c) Explain the mutualistic relationship between mammals and the microorganisms in their digestion tract. *(10 marks)*
8. (a) Describe the functions of the human placenta. *(12 marks)*
(b) Explain the advantages of internal fertilization. *(08 marks)*
9. (a) Differentiate between **hormonal** and **nervous coordination**. *(07 marks)*
(b) Explain how unequal distribution of auxins influences tropic responses in plants. *(07 marks)*
10. (a) How is support achieved in herbaceous plants? *(05 marks)*
(b) (i) What problems are faced by plants growing in water logged soils? *(05marks)*
(ii) Explain how some plants have been able to overcome the above problems. *(10 marks)*

END