

**AS Level Biology B**  
**H022/01** Foundations of biology

**Question Set 13**

1 Variegin is a small protein molecule that has been isolated from the salivary glands of the tick species, *Amblyomma variegatum*.

(a) Variegin is a competitive inhibitor of the blood-clotting enzyme, thrombin.

(i) Using your knowledge of the role of thrombin in the blood-clotting process, explain how variegin acts as a competitive inhibitor.

[3]

(ii) Fig. 1 shows the effect of two different inhibitors, Y and Z, on the activity of thrombin as substrate concentration increases.

Curve X shows the effect of substrate concentration without an inhibitor.

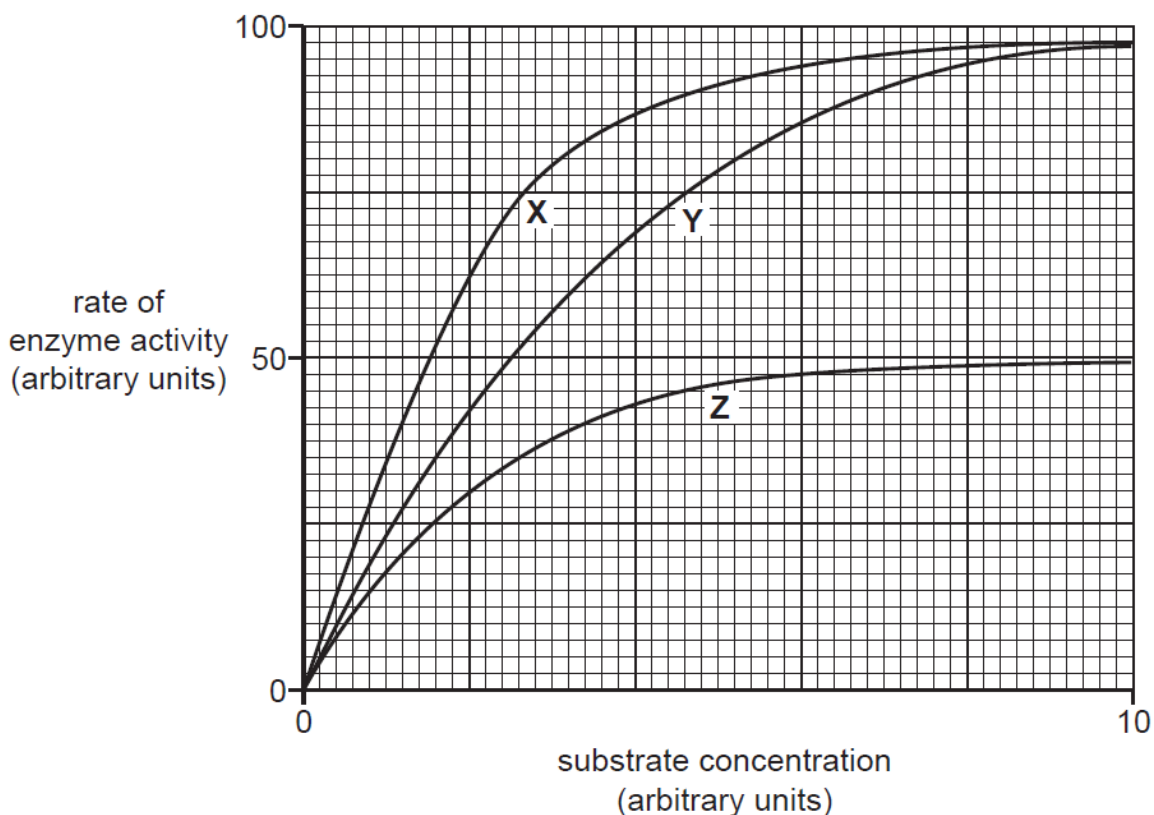


Fig.1

Which of the curves, labelled in Fig. 1, shows the effect of variegin on the activity of thrombin?

Give a reason for your choice.

[1]

(iii) Using Fig. 1, calculate the percentage decrease in rate of enzyme activity when inhibitor Z is present at a substrate concentration of 4.0 arbitrary units. Give your answer to 2 significant figures.

decrease = ..... %

[2]

- (b) Heparin is a blood-clotting inhibitor which can be used to treat people with a disorder known as antiphospholipid antibody syndrome (APS).

People with APS produce antibodies that attach to phospholipid molecules in cells. Suggest why this may result in the formation of blood clots in the circulatory system.

[2]

**Total Marks for Question Set 13: 8**



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