1. You are provided with specimen **S** and solutions **X** and **Y**, which are of different concentrations.

(a) (i) Label **three** test tubes T_1, T_2 and T_3. To each of the test tubes, add a mixture of solution **X** and solution **Y** as indicated in table **1**.

Table 1

Test tube	Volume of **X** (cm^3)	Volume of **Y** (cm^3)
T_1	0.0	10.0
T_2	5.0	5.0
T_3	10.0	0.0

(ii) Using a 5 mm cork borer, obtain **three** potato cylinders from specimen **S** and trim each cylinder to a uniform length of 3.0 cm.

(iii) Place **one** potato cylinder in each of the test tubes T_1, T_2 and T_3 and ensure it is completely immersed in the solution. Keep the cylinders in the solutions for 25 minutes. (*You may continue doing other work.*)

(iv) After 25 minutes, remove the potato cylinders from solutions and measure the final length of each of the cylinders. Record your results in table **2** and determine the changes in length of each potato cylinder.

Table 2 *(03 marks)*

Test tube	Initial length (cm)	Final length (cm)	Change in length (cm) (Final length - Initial length)
T_1	3.0		
T_2	3.0		
T_3	3.0		

(b) (i) Explain the change in length of the potato cylinder in the test tube T_1. *(04 marks)*

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(ii) Why is the change in length of the potato cylinder in test tube T_2 different from that in T_3? (*04 marks*).

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(c) (i) Feel the potato cylinder from T_1 between your fingers, try bending without breaking it. Repeat the procedure for the potato cylinder in T_3. Describe your observations.

Potato cylinder from T_1 (*02 marks*)

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Potato cylinder from T_3 (*02 marks*)

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(ii) What is the significance of the observations in (c)(i) to the plant?

Potato cylinder from T_1 (*02 marks*)

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Potato cylinder from T_3 *(02 marks)*

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(d) How can the observed changes in the potato cylinder in test tube T_1 be reversed to its original state? *(01 mark)*

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2. You are provided with specimens **P**, **Q** and **R** which are plant organs.

(a) Cut longitudinally through each of the specimens **Q** and **R**.

(i) Observe the cut surfaces and state the type of fruit to which specimens **Q** and **R** belong.

Specimen **Q** ..... *(01 mark)*

Specimen **R** ..... *(01 mark)*

(ii) Describe the observable structures in one half of each of the specimens **Q** and **R**.

Specimen **Q** *(03 marks)*

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Specimen **R** (*02 marks*)

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(iii) What are the advantages of the type of dispersal of specimen **Q** over that of **R**? (*03 marks*)

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(b) Using observable features, explain how specimen **P** is dispersed. (*03 marks*)

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(c) (i) Put one half of specimen **R** on a table, measure and record the length of the fruit from the stalk up to the scar. (*01 mark*)

Length ..... cm

(ii) Draw and label **one** half of specimen **R**. State the magnification of your drawing. *(06 marks)*

3. You are provided with specimens **T** and **U** obtained from a mammal.

(a) Observe and feel the working surface of each of the specimens with your fingers.

(i) Describe what you observed and felt.

Specimen **T** *(02 marks)*

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Specimen **U** *(02 marks)*

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(ii) From your observations, identify the specimens **T** and **U**.

T ..... *(01 mark)*

U ..... *(01 mark)*

b) Outline **four** structural differences between specimens **T** and **U**. *(04 marks)*

	T	**U**
(i)		
(ii)		
(iii)		
(iv)		

(c) (i) State the function of each specimen to the mammal. *(02 marks)*

T

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U

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(ii) Explain **two** adaptations of specimen **U** to its function. (*04 marks*)

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(d) (i) Identify the longest portion of specimen **T** and then measure it. Record your results. (*½ mark*)

Length ..... cm

(ii) Draw and label specimen **T**. State your magnification. (*3½ marks*)

END