Apex Examination Council

APEX EXAMINATION COUNCIL

END OF TERM ONE EXAMINATION 2025

S.6 BIOLOGY PRACTICAL EXAMINATION 530/3

3HOURS AND 15 MINUTES

***INSTRUCTIONS*:**

- *Attempt all questions in this paper*
- *Untidy work will lead to loss of marks*

FOR EXAMINER'S USE	
QUESTION	**SCORE**
1.	
2.	
3.	
TOTAL SCORE	

Q.1 You are provided with freshly specimen P.

(a) With reasons state the class to which P belongs

Class

(01 mark)

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Reasons

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(b) Examine the observable external structural features on the head of specimen. Describe how any three structural features contribute to successful survival of specimen P in its habitat.

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(c) Pin specimen P on a dissection ventral side uppermost, cut and pin the skin. Carefully remove the superficial secretory structures and examine the remaining superficial muscles. Make a drawing of the exposed muscles, label only those concerned with mastication, inhalation and movement of the arm.

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…… ***(8 marks)***

(c)(i) Continue with your dissection and open the chest cavity to expose the viscera b. Draw and label the exposed left visceral structures in the chest region in situ

(12 marks)

(ii) Now open up the abdominal cavity to expose the visceral structures in the abdominal region. Loosen the mesentery and follow the displayed route of blood supply to intestine and its associated organs. Draw and label this part of your dissection, excluding the stomach.

(15 marks)

Q.2 You are provided with a filter paper, **specimen A**, **solution T**, extract **X**, **Y** and **Z** prepared from seedlings at different days of growth.

(i) Peel specimen A and cut to obtain one piece of tissue measuring **2cm x 2cm x 2cm**.

(ii) From filter paper, measure and cut out five square pieces each measuring **5mm x 5mm**. place in a dry petridish.

(iii) Cut the obtained cube of specimen A into smaller pieces, and crush it into fine paste using a motor and a pestle, add **$10cm^3$** of water and then decant into a test tube. Mix well and leave to stand for **two minutes**. Heat extract A to a temperature of 60^oc. Leave it as extract A.

Using the reagents provided, carry out tests on extract and record your tests, observations and deductions in the table 1 below

Table 1

(10 marks)

Test	Solution	Observation	deductions
Iodine test	**A**		
	X		
	Y		
	X		

Benedict's test	**A**		

(b) Giving reasons from your observations, state the extract prepared from seedlings at;

(i) Earlier stage of growth.

(01 marks)

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(ii) Very advanced stages of growth.

(01 marks)

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(c) (i) Label 3 test tubes as **1**, **2** and **3** and to each test tube add $20cm^3$ of solution T

(ii) Label three petri dishes as $\mathbf{A_X}$, $\mathbf{A_Y}$ and $\mathbf{A_Z}$ and to each petridish add $5cm^3$ of corresponding solutions.

(iii) Place one square piece of the filter paper to each of the petri dishes A_X, A_Y and A_Z and soak it in the extract in the petri dish.

(iv) Leave the set ups to stand for one minute.

(v) After one minute remove one square piece of filter paper from $\mathbf{A_x}$ using a glass rod or spatula or forceps and introduce it into solution in test tube 1and also start a stop clock. Stop the stop clock when it is back to the surface. Repeat with $\mathbf{A_Y}$ to test tube 2 and $\mathbf{A_z}$ to test tube

3. For each test tube, record in table 2 the time taken and observation.

Table 2

(06 marks)

Test tube	Observations	Time taken for the filter paper to reach the bottom in seconds.	Time taken for the filter paper to reach the top in seconds.
1			
2			
3			

(d) Using results of table 2 above,

(i) State what is contained in specimen solutions X, Y and Z.

(01 mark)

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(ii) From your results in table 2, what is the experiment about?

(01 mark)

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(iii) Explain your observations in the following test tubes:

Test tube 1

(03 marks)

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Test tube 3

(03 marks)

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(iv) What is the biological significance of the results in table 2.

(01 mark)

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(e) Now obtain three test tubes and label them as **X**, **Y** and **Z**, then to each test tube add the corresponding solution X, Y and . Leave the solutions to stand for 10 minutes and then decant the extract to obtain clear solutions.

Label 3 other test tubes A_1 – A_3 and to all add 2cm3 of extract A

To test tube A_1, add $2cm^3$ of clear solution X. To test tube A_2 add $2cm^3$ of clear solution Y and to test tube A_3 add $2cm^3$ of clear solution Z

Table 3 shows the summary of test tubes and their contents.

Table 3

Test tube	**Content**
1	$2cm^3$ of solution **A** + $2cm^3$ of clear solution **X**
2	$2cm^3$ of solution **A** + $2cm^3$ of clear solution **Y**
3	$2cm^3$ of solution **A** + $2cm^3$ of clear solution **Z**

Incubate all the three test tubes in a water bath maintained at 37 – 40°c for 30 minutes, shaking periodically. After this time, record your observations and conclusions in table 4 below.

Table 4

(03 marks)

Test tube	**Observation**	**Conclusion**
A_1		
A_2		

A_3		

(i) What was the purpose of the following;

Heating the extract A at 60^{o}c

(01 marks)

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Leaving the extracts X, Y and Z to stand for 10 minutes.

(01 mark)

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(ii) Explain the results in table 4 from test tubes A1 and A2

Test tube A_1

(02 marks)

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Test tube A_3

(02 marks)

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(iii) State the significance of the biological activity investigated in table 4 above.

(02 marks)

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Q.3 You are provided with specimens I which is a plant organ

(a) Identify specimen K with reasons

(03 marks)

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(b) Cut a thin section of the tissue using a surgical blade or razor blade, place it on a microscope slide and stain it with Iodine solution. Mount it on a microscope and observe using low power magnification.

i) Describe the structure of the tissue as observed under the microscope (3 marks)

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ii) Draw and label the tissue plan as observed under a microscope. (6 marks

END

Specimen P……Rat

Requirements for dissection

30 mls of:

Extract X, Prepared by crushing 200g of 1 day old, cotyledons of bean seedlings in 500ml of water

Extract Y, prepared by crushing 200g of 3 day old, cotyledons of bean seedlings in 500ml of water.

Extract Z, prepared by crushing 200g of 5 day old, cotyledons of bean seedlings in 500ml of water.

Irish potato ……**specimen A**

1 filter paper

Razor blade

Mortar and pestle

40ml of Water

Food test reagents; iodine solution and Benedict's solution

Heat source

10ml measuring cylinder

Stop clock

20 mls of 3% hydrogen peroxide ….solution T

Thermometer

3 petri dishes

Plastic beaker

Hot water

7 test tubes

Irish potato tuber ……specimen I