



COLLEGE SAINTE MARIE REINE KABGAYI

END OF TERM I EXAMINATIONS, 2025-2026

DURATION: 3 HOURS

SENIOR S6 MCB-PCB

SUBJECT: BIOLOGY II

CLASS:

INSTRUCTIONS:

- 1) Do not open this question paper until you are told to do so.**

2) This paper consists of Two sections: A and B

SECTION A: Attempt all questions(70marks)

SECTIONB: Attempt any three questions (30marks)

- 3) For multiple choice questions circle the correct letter corresponding to appropriate answer .**

 - 4) Use only a blue**

SECTION A: Attempt all the questions in this section./70 marks

1. Match the type of tropism on the left with its correct description on the right.
(6 marks)

Tropism	Description
1. Phototropism	A) Plant growth response to touch or contact with an object.
2. Gravitropism	B) Plant growth response to light, causing it to grow towards the light source.
3. Thigmotropism	C) Plant growth response to gravity, causing roots to grow downward and stems upward.

- 2.** Which one of the following is not correct about viruses?

- a) Can only reproduce in living cells. **1mark**
- b) Are the smallest living organisms.
- c) Are facultative parasites.
- d) Do not have a cellular structure.

3. Which one of the following features of red blood cells does not contribute to their high absorptive nature of oxygen? They **1mark**

- e) Possess a thin flexible membrane
- f) Possess a biconcave disc shape
- g) Are filled with hemoglobin
- h) Are manufactured at a high rate

4. Complete the table below related to the food test./**10**

Food nutrient tested	Reagent used	Boiling or not	Positive test	Negative test
	Benedict solution			
Starch				Yellow solution
	Millon's reagent	Boiling		

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5. True/False questions concerning carbohydrates and lipids. (10 marks)

- a) Carbohydrates and lipids are both primarily used by the body as an immediate source of energy, but carbohydrates are more easily converted to glucose.....

- b) Lipids, unlike carbohydrates, are less efficient at forming structural components in cell membranes.....
- c) The presence of an ester bond in the structure of both carbohydrates and lipids is critical for their energy storage properties."
- d) A high concentration of carbohydrates in the diet leads to the storage of energy primarily as glycogen in the liver and muscles, while lipids are stored as triglycerides in adipose tissue.
- e) Carbohydrates contribute more to long-term energy storage than lipids due to their higher energy density.

6.DNA replication is described as *semi-conservative* because:/2

- A. Each daughter molecule contains two new strands
- B. Each daughter molecule contains one new and one original strand
- C. Both strands remain unchanged
- D. Only one strand is replicated

7.Which enzyme unzips the DNA double helix?/2

- A. DNA polymerase
- B. Helicase
- C. Ligase
- D. Primase

8.The enzyme that adds complementary DNA nucleotides during replication is:/2

- A. Ligase
- B. Polymerase
- C. Endonuclease
- D. ATP synthase

9.Predation can best be defined as:/2

- A. One organism benefits, the other is unaffected
- B. Both organisms benefit
- C. One organism kills and eats another
- D. One organism lives inside another and harms it

10.A predator adaptation includes:/2

- A. Bright warning colors
- B. Camouflage and sharp senses
- C. Reduced mobility
- D. Dependence on a host

11.a. Explain the roles of helicase, DNA polymerase, and ligase./6

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b. Why is DNA replication described as semi-conservative?/2

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12. Calculate the amount of energy produced by 5 moles of ATP

a) Under standard conditions /5

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b) In a living cell /5

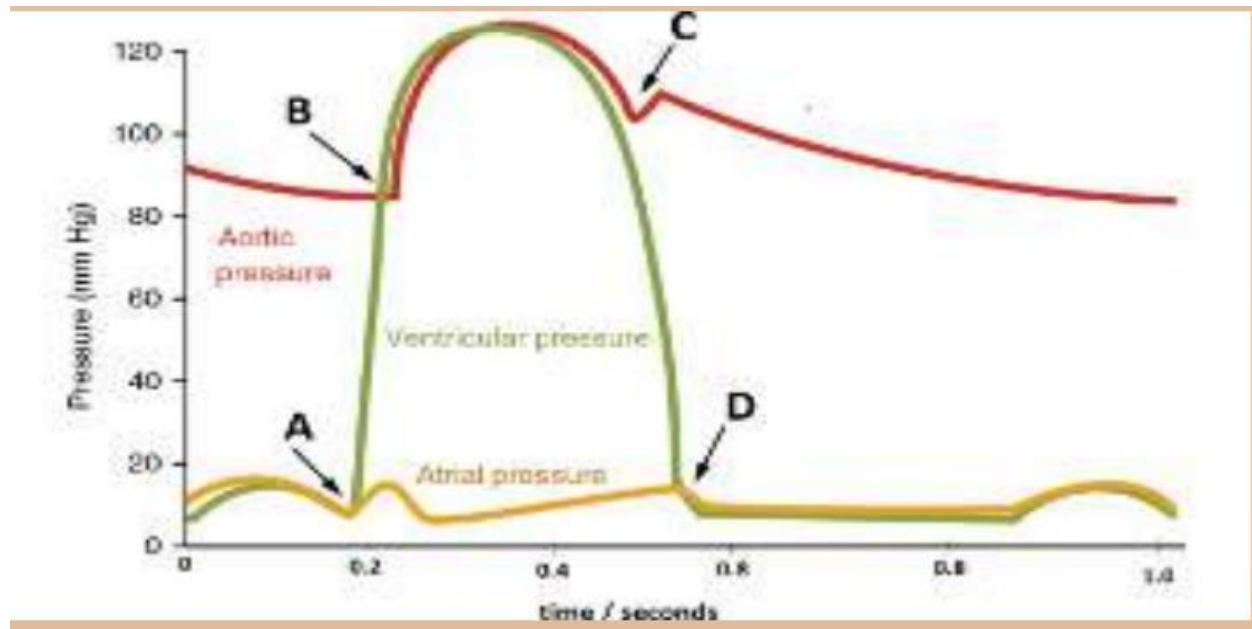
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13. Why is it important that the AV node delay the electrical impulse moving from the SA node and the atria to the ventricles?/2

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14. Use the diagram below to answer the questions



a) State what is happening at point A,B,C,D on the graph. /4

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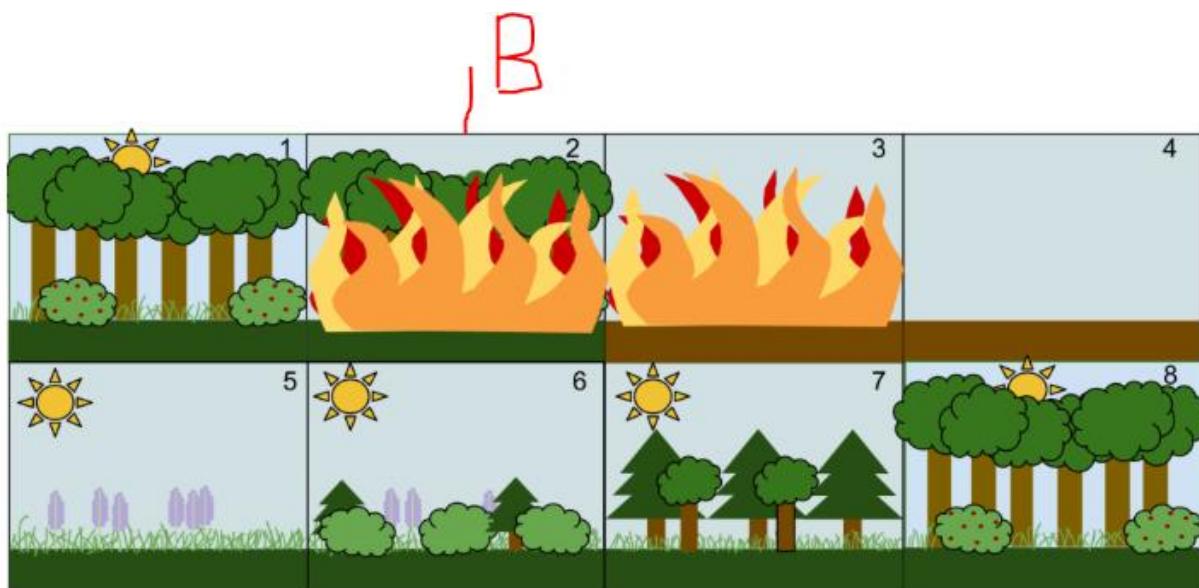
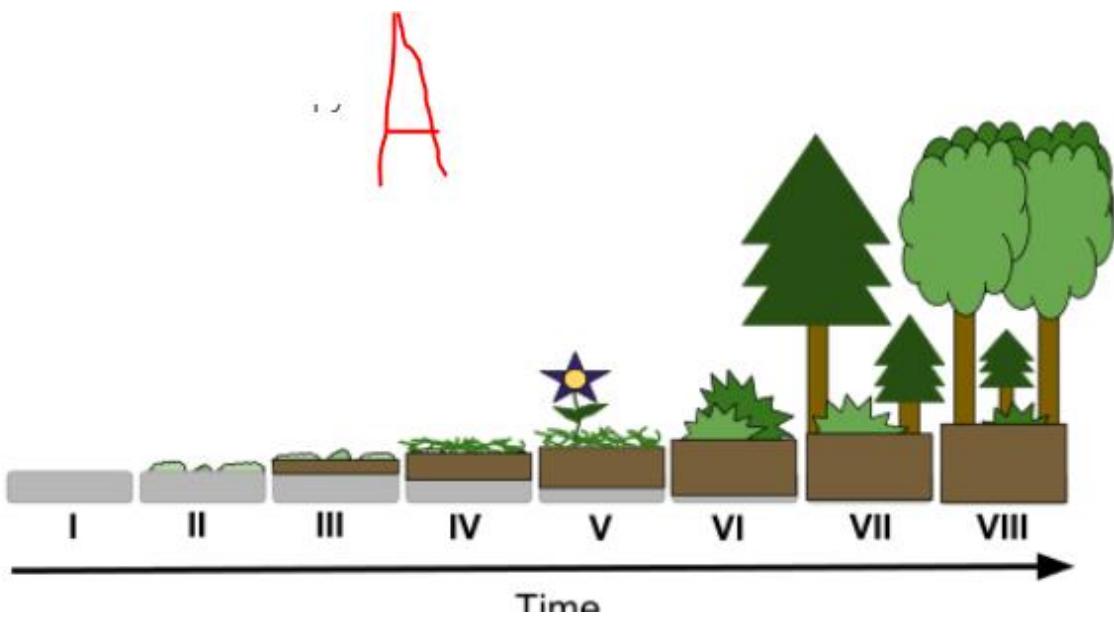
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b) If the time taken for one complete cardiac cycle is 0.8 seconds, how many cardiac cycles are there in one minute? /2

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15. using pictures below what is the type of ecological succession in each area(A an B)? Differentiate them./5



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SECTION B: Attempt only **THREE** questions. (30 marks)

16. What are the advantages and disadvantages of using enzymes in industries like food processing or biofuel production? How would you assess the benefits in comparison to the challenges that come with using enzymes in these processes? (10 marks)

Q17. Compare and contrast between the xylem and Phloem (10 Marks)

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18. In Humans

- **F** = free earlobes (dominant), **f** = attached
 - **D** = dimples (dominant), **d** = no dimples

A heterozygous man (FfDd) has children with a woman with genotype (ffdd).

- a. Draw the Punnett square.
 - b. Determine the genotypic ratio.
 - c. Determine the phenotypic ratio.
 - d. What percentage of children are expected to have free earlobes AND dimples?

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19. a. What is the main function of the heart?
b. Name the four chambers of the heart.
c. Which side of the heart pumps blood to the lungs?
d. Why are the walls of the left ventricle thicker than the right?
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20. a. How does the oxygen dissociation curve of fetal haemoglobin compare to adult haemoglobin?
b. Why must fetal haemoglobin have a higher affinity for oxygen?
c. How does this difference ensure oxygen transfer in the placenta?
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MERRY CHRISTMAS !!!!