

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION 2008

Biology Paper II

Time allowed: 2 hours 25 minutes Marks 40

INSTRUCTIONS

Please read the following instructions carefully.

1. Check your name and school information. Sign that it is correct.

**I agree that this is my name and school.
Candidate's signature**

2. Write the number of the seat in which you are sitting.
3. RUBRIC. There are Seven questions. Answer ALL SEVEN questions. Questions 5, 6 and 7 offer choices, answer any one choice from each.
4. When answering the questions:

Read each question carefully.
Use ONLY black ink.
Do not use staples, paper clips, glue or correcting fluid.
DO NOT write outside the answer box.
Complete your answer in the allocated space only.
5. The marks for the questions are shown in brackets ().

Q.1. (Total 6 Marks)

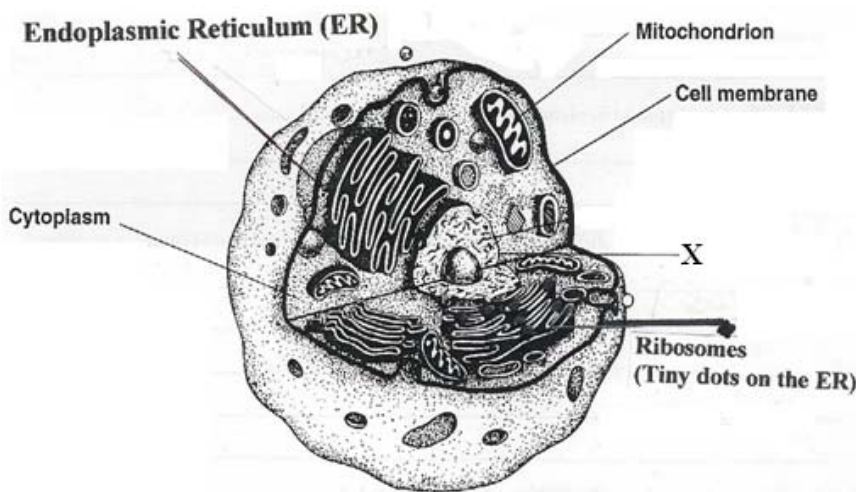
a. Write TWO differences between prokaryotic and eukaryotic cells. (2 Marks)

1. _____

2. _____

b. Cells are structural and functional units of life. Describe structural adaptation in cells according to their functions (for example epithelial cells). (3 Marks)

c. Label the organelle shown as X in the given animal cell. (1 Mark)



X. _____

Q.3. (Total 6 Marks)

a. Enzymes break down macromolecules into their smaller constituents. Which enzyme breaks down proteins in the small intestine? (1 Mark)

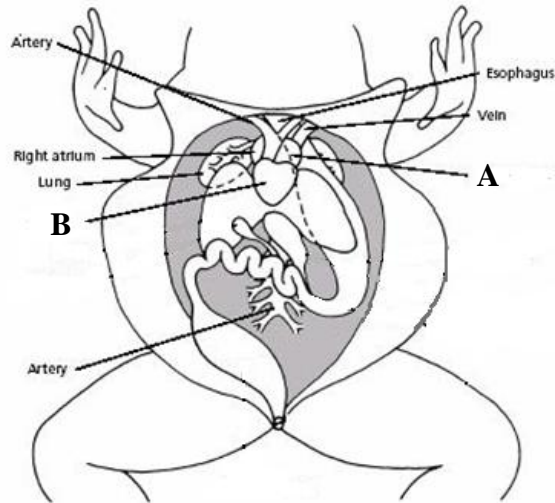
b. Describe the absorption of food in the ileum. (4 Marks)

c. What is the thallus? (1 Mark)

Q.4.

(Total 6 Marks)

- a. Given below is the figure of a dissected frog. Write the names of the parts labelled as A and B. (1 Mark)



A. _____

B. _____

- b. Write TWO differences between aerobic and anaerobic respiration. (2 Marks)

- c. Describe respiration in the frog during hibernation. (3 Marks)

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AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION 2009

Biology Paper II

Time allowed: 2 hours 25 minutes Marks 40

INSTRUCTIONS

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1. Check your name and school information. Sign that it is correct.

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2. RUBRIC. There are EIGHT questions. Answer ALL EIGHT questions. Questions 6, 7 and 8 each offer TWO choices. Attempt any ONE choice from each.
3. When answering the questions:

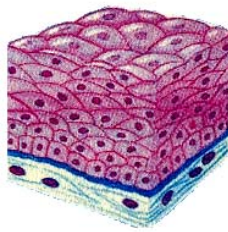
Read each question carefully.
Use a black pencil for diagrams. DO NOT use coloured pencils.
DO NOT use staples, paper clips, glue, correcting fluid or ink erasers.
Complete your answer in the allocated space only. DO NOT write outside the answer box.
4. The marks for the questions are shown in brackets ().

Q.1.

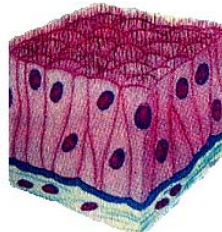
(Total 6 Marks)

a. The diagrams below show two types of epithelial cells.

(2 Marks)



A



B

i. Identify A _____ B. _____

ii. Where are these cells found in the body?

A _____ B. _____

b. State the special feature of xylem cells that helps a plant to transport water from its roots to its leaves. (1 Mark)

c. Look at the diagram of the carpel of a flower.



i. Name the processes that take place at A and B. (2 Marks)

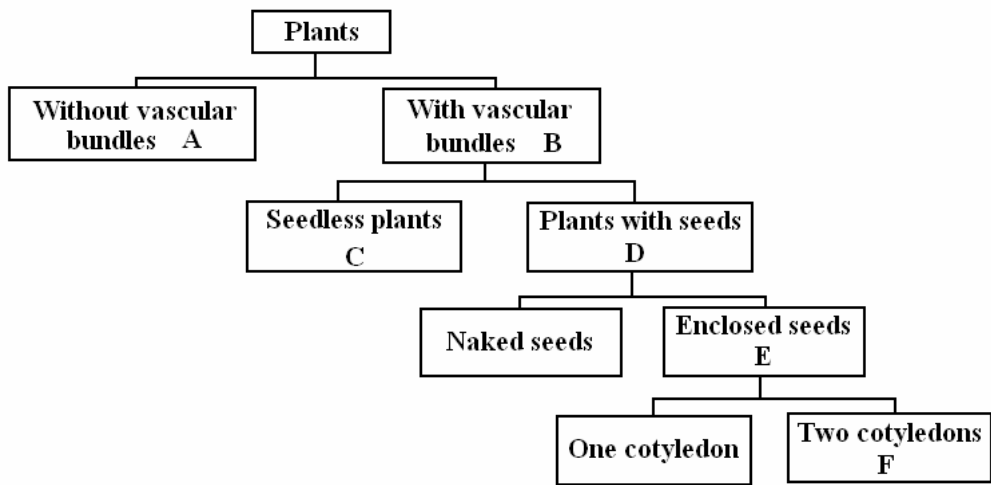
ii. Each carpel is divided into three parts. Which part turns into the fruit? (1 Mark)

Q.2.

(Total 5 Marks)

a. Use the following key to identify different plant groups A, B, C, D, E and F.

(3 Marks)



Letters in key	Name of plant group
A	
B	
C	
D	
E	
F	

b. Give TWO uses of algae.

(2 Marks)

Q.3. (Total 6 Marks)

a. Give reasons for the following:

i. Why some sponges appear green in colour? (1 Mark)

ii. Why liver fluke and tape worms are called triploblastic animals? (1 Mark)

iii. Why molluscs are commercially very important? (1 Mark)

iv. Why earth worms are considered as farmers' friend? (1 Mark)

b. Give TWO characteristic features of the class Aves. (2 Marks)

Q.4.

(Total 4 Marks)

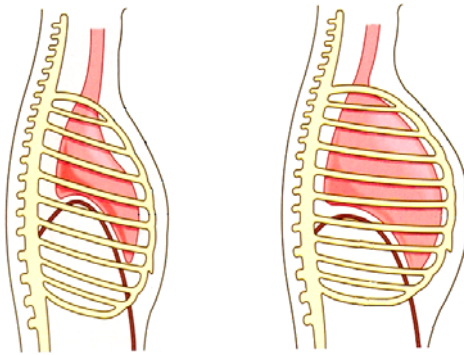
Differentiate between carbohydrates and protein with reference to:

		Carbohydrates	Proteins
i.	Composition (elements)		
ii.	Source		
iii.	Caloric value/gm		
iv.	Function		

Q.5.

(Total 4 Marks)

a. The diagrams below show two steps of breathing in man.



i. Label on the diagram which one shows exhalation. (1 Mark)

ii. What happens to the ribcage and diaphragm when a person is taking in air? (2 Marks)

b. Why do smokers have a lower concentration of oxygen in their blood than non-smokers? (1 Mark)

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION 2010

Biology Paper II

Time allowed: 2 hours 25 minutes Marks 40

INSTRUCTIONS

Please read the following instructions carefully.

1. Check your name and school information. Sign that it is correct.

**I agree that this is my name and school.
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2. RUBRIC. There are NINE questions. Answer ALL NINE questions. Questions 7, 8 and 9 each offer TWO choices. Attempt any ONE choice from each.
3. When answering the questions:

Read each question carefully.
Use a black pencil for diagrams. DO NOT use coloured pencils.
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Complete your answer in the allocated space only. DO NOT write outside the answer box.
4. The marks for the questions are shown in brackets ().

Q.1. (Total 4 Marks)

Scientific advances in technology have a notable impact on human welfare. Justify the given statement using cloning as an example.

Q.2. (Total 4 Marks)

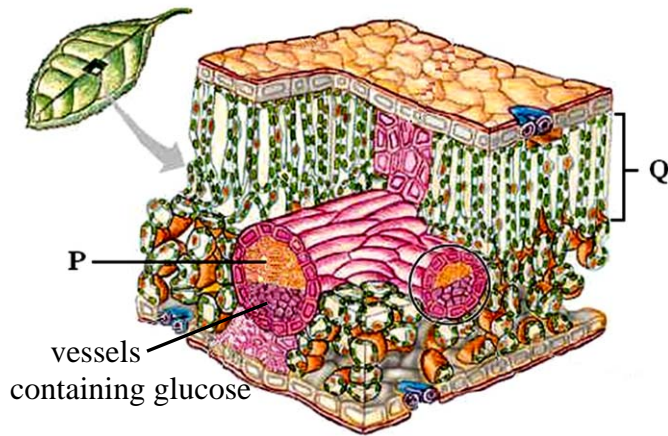
a. You are conducting a food test that requires use of glassware, chemicals and heat. Write any TWO safety measures you need to take during the experiment. (2 Marks)

b. Give any TWO possible reasons why a water living organism is endangered? (2 Marks)

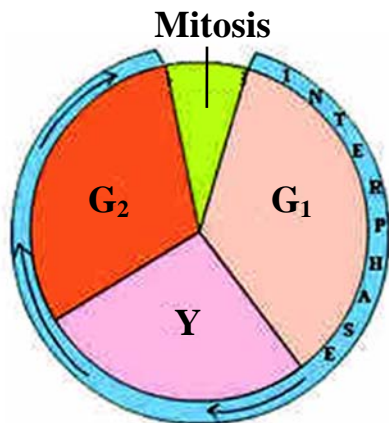
Q.3.

(Total 4 Marks)

- a. The diagram shows different cells of a leaf. Briefly describe how the labelled structures P and Q are specialized to perform their function efficiently. (2 Marks)



- b. The diagram shows a cell cycle. Identify the missing phase Y in the cycle. State what important role it plays in the cell cycle. (2 Marks)



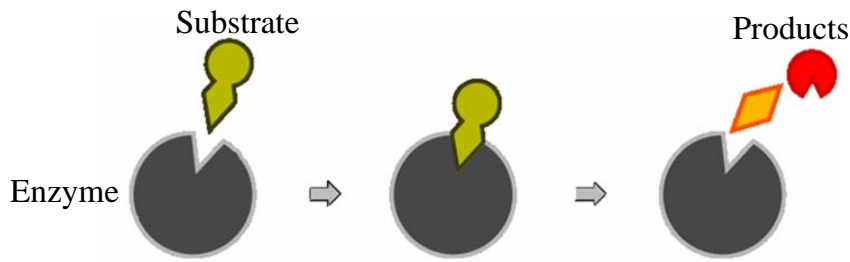
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Q.4.

(Total 4 Marks)

a. The diagram shows an enzyme catalysed reaction.

(1 Mark)



Which characteristic of enzymes is shown in the diagram?

b. Photosynthesis is a process through which plants prepare their own food. How is this process important for animals? (1 Mark)

c. Give any TWO ways through which respiratory energy is used in a human body. (2 Marks)

(2 Marks)

Q.5.

(Total 4 Marks)

a. The picture below shows the effect of excessive use of fertilizer.

(2 Marks)



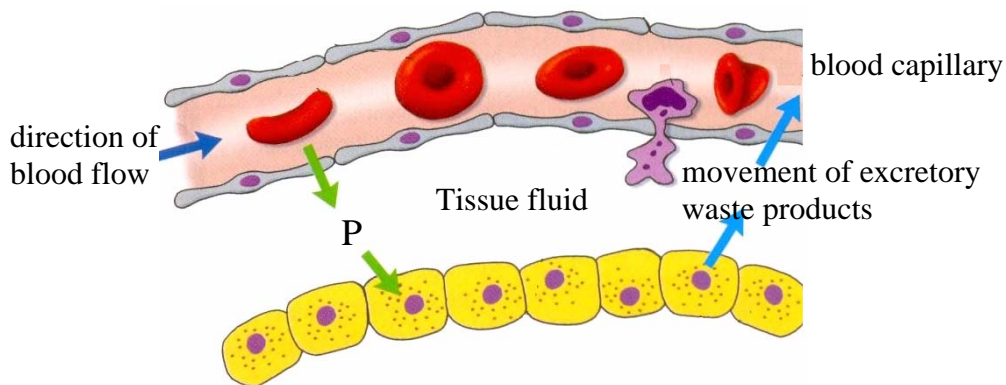
Give reason for such condition in the plant shown.

- b. The small intestine is about 6-8 metres long. Give TWO reasons of this length being beneficial to the human body? (2 Marks)

Q.6. (Total 5 Marks)

- a. Give an account of the effect of increased humidity on the rate of transpiration. (2 Marks)

- b. The diagram shows the transference of materials between capillary and tissue fluid.



- i. Which structural feature of the blood capillary helps in the transference of materials? (1 Mark)

- ii. Name the TWO substances moving from blood capillary to the tissue fluid at region P. (2 Marks)

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AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

MAY 2011

Biology Paper II

Time allowed: 2 hours 25 minutes Marks 40

INSTRUCTIONS

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2. RUBRIC. There are NINE questions. Answer ALL NINE questions. Questions 7, 8 and 9 each offer TWO choices. Attempt any ONE choice from each.
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4. The marks for the questions are shown in brackets ().

Q.1.

(Total 4 Marks)

a. State the role of the following in the welfare of mankind.

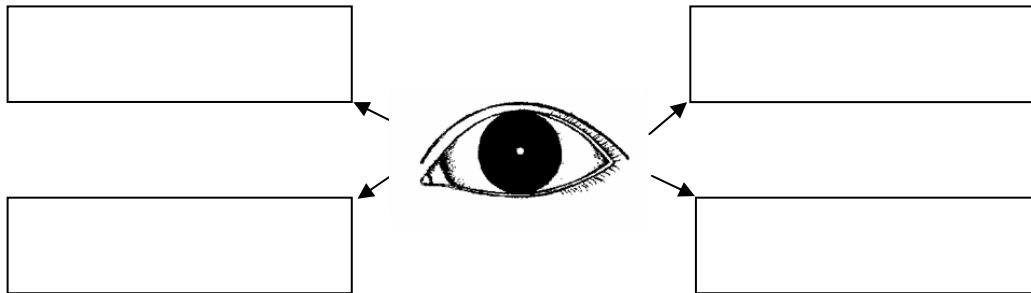
(2 Marks)

i. Horticulturist

ii. Surgeon

b. Complete the given diagram by naming the different tissues that make up the eye as an organ.

(2 Marks)



Q.2.

(Total 4 Marks)

a. How is the validity of a hypothesis tested?

(1 Mark)

b. The scientific name of the frog is *Rana tigrina*. Why do we give a scientific name to a living organism? Rewrite the given scientific name of the frog following the rules of binomial nomenclature.

(3 Marks)

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Q.3.

(Total 4 Marks)

- a. The Golgi bodies in an animal cell have lost their ability to produce lysosomes. What changes do you expect in such a cell? (2 Marks)

- b. Define the term haploid. Give an example of haploid cells found in the human body. (2 Marks)

Q.4.

(Total 4 Marks)

- a. A very small amount of papaya is often added to meat to tenderise it (make it soft) as papaya contains some enzymes.

Write TWO characteristics of enzymes that are referred in the above example. (2 Marks)

- b. The table shows the difference in the amount of energy produced as a result of aerobic and anaerobic respiration. (2 Marks)

	Aerobic respiration	Anaerobic respiration
Amount of energy	36 ATP	2 ATP

Give a reason for the difference in values in the above table.

Q.5. (Total 4 Marks)

a. Name any TWO micro-nutrients required by a plant for its normal growth and reproduction. (1 Mark)

b. The table shows the composition of diet of different vulnerable groups. (3 Marks)

Groups	Diet
Child (4-6 years)	Meat, eggs, bread and potato
Adult (above 50)	Fish, apples, rice and spinach
Labourer	

i. Why are the dietary requirements of a child different from those of an adult?

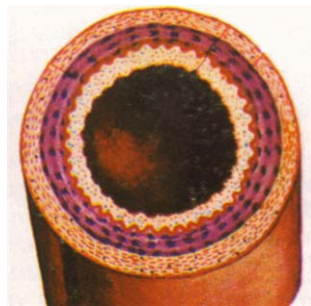
ii. Complete the given table by inserting the dietary requirement of a labourer.

Q.6.

(Total 5 Marks)

- a. Transpiration causes loss of water, yet this loss has some benefits. Describe TWO ways in which transpiration is beneficial for the plants. (2 Marks)

- b. The diagram shows a type of blood vessel. (3 Marks)



Identify the blood vessel shown in the diagram. Give TWO characteristics of this blood vessel that are visible in the diagram.

Q.7.

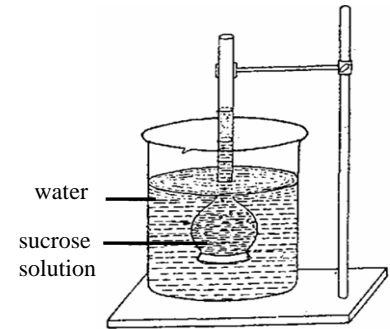
(Total 5 Marks)

EITHER

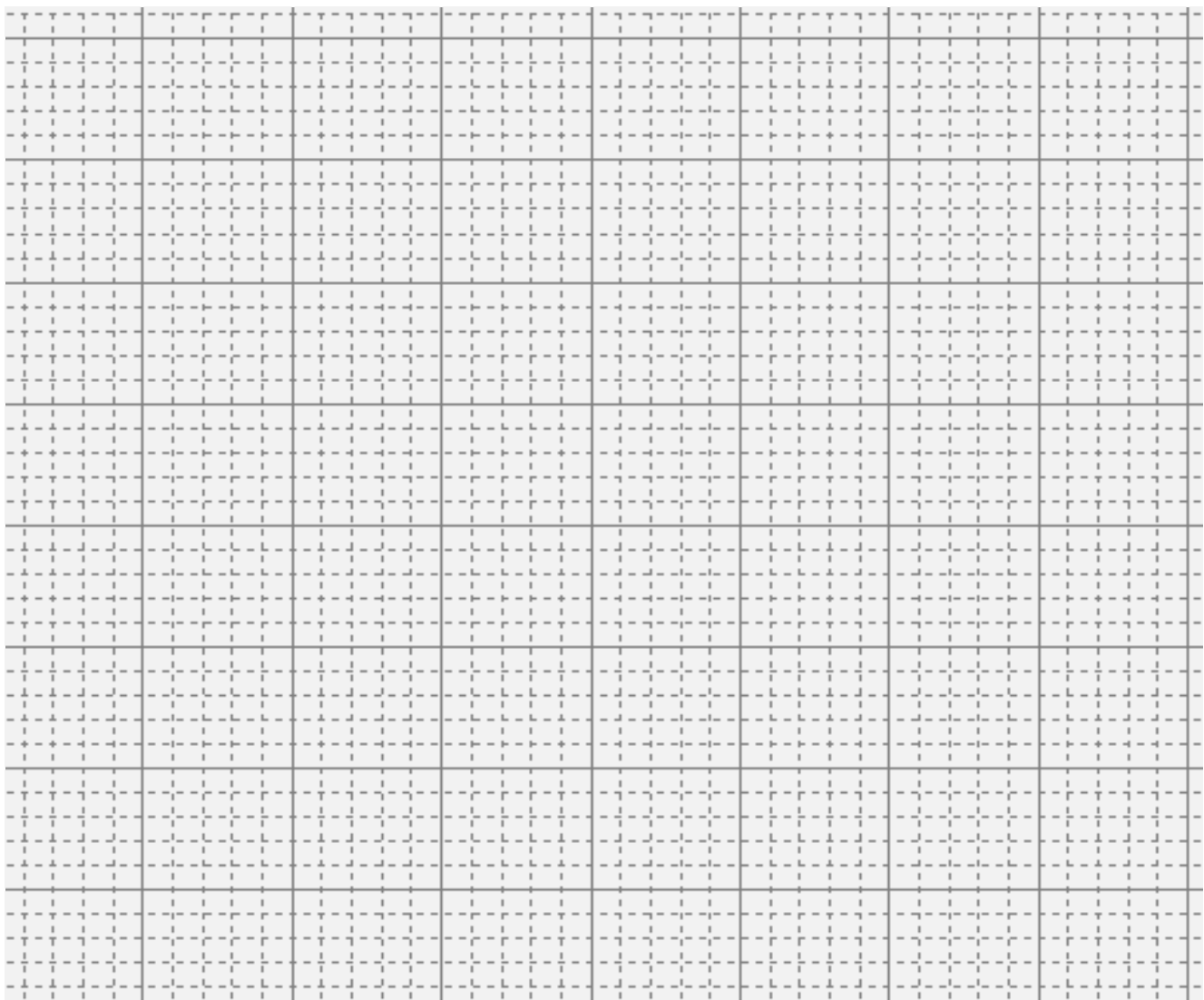
- a. The diagram shows the set up to demonstrate the process of osmosis using sucrose solution. The experiment was performed using different concentrations of sucrose solution and the rate of osmosis was observed.

Present the results given in the table in the form of a graph.

(Consider the position of quantities on X-axis and Y-axis)



S.No.	Concentration of Sucrose Solution (%)	Rate of osmosis (arbitrary units)
1	2	10
2	3	20
3	5	40
4	6	50
5	8	70



AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

MAY 2012

Biology Paper II

Time allowed: 2 hours 25 minutes Marks 40

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1. Check your name and school information. Sign that it is correct.

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Complete your answer in the allocated space only. DO NOT write outside the answer box.
4. The marks for the questions are shown in brackets ().

Q.1.

(Total 4 Marks)

State the role of the following in the field of biology.

i. Environmental biologist

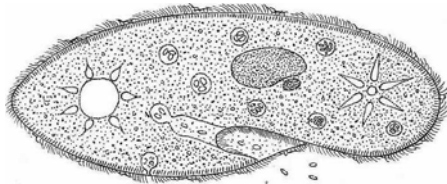
ii. Immunologist

Q.2.

(Total 4 Marks)

- a. Mention TWO formats to present the observations or results of an experiment in a biological method. (2 Marks)

- b. Give TWO structural features of the organism shown in the diagram. (2 Marks)



Q.3.

(Total 4 Marks)

a. Differentiate between rough and smooth endoplasmic reticulum.

(2 Marks)

Rough Endoplasmic Reticulum	Smooth Endoplasmic Reticulum
1.	1.
2.	2.

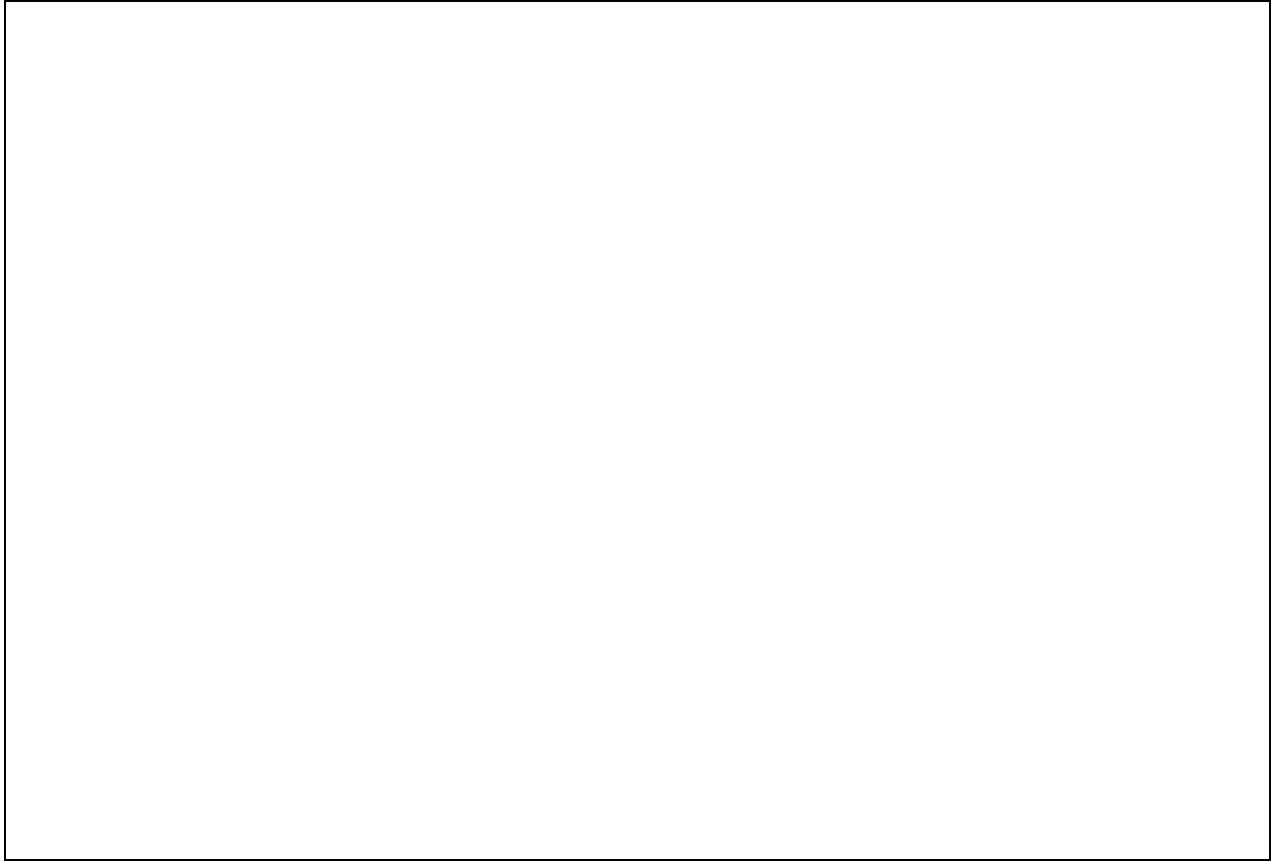
b. Besides being a phenomenon of cellular death, how is apoptosis beneficial for our body?

(2 Marks)

Q.4.

(Total 4 Marks)

- a. Draw a graph to show the effect of pH on the activity of a gastric enzyme, pepsin. (2 Marks)



- b. A plant was kept in a cupboard for 3 days after which one of its leaves was tested for starch.

The starch test appeared negative. Why?

(2 Marks)

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Q.5. (Total 4 Marks)

a. A person is suffering from swollen and bleeding gums.

What food items should he/she include in his/her diet to overcome this disease? (2 Marks)

b. Somalia has been affected by the destruction of its rural and urban economies for the last twenty years. The country is now facing extensive famine. According to reports, thousands of people have died from malnutrition. The lives of several million people are in danger.

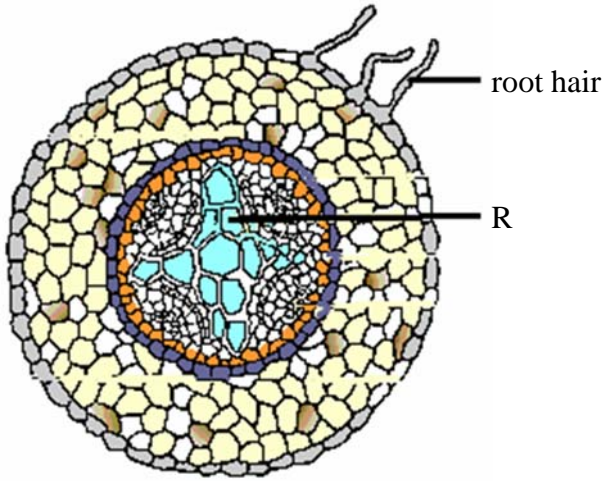
Discuss a factor that could be a reason for such state of the country. (2 Marks)



Q.6.

(Total 5 Marks)

The diagram shows the section of the root of a plant.



i. Identify the structure labelled R and state ONE function it performs in the root. (2 Marks)

ii. State THREE main structural features that help structure R to carry out this function. (3 Marks)

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

MAY 2013

Biology Paper II

Time: 2 hours 25 minutes Marks: 40

INSTRUCTIONS

Please read the following instructions carefully.

1. Check your name and school information. Sign if it is accurate.

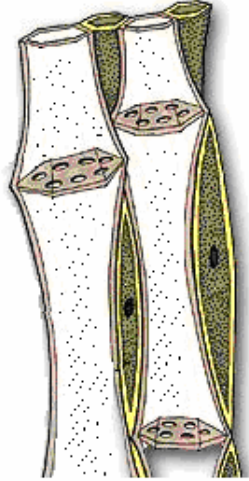
**I agree that this is my name and school.
Candidate's signature**

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3. When answering the questions:

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Complete your answer in the allocated space only. DO NOT write outside the answer box.
4. The marks for the questions are shown in brackets ().

Q.1. (Total 5 Marks)

a. The diagram shows a tissue found in plants. (2 Marks)



Mention any TWO special features which help this tissue to perform its function efficiently.

b. Describe the phenomenon of active transport on the basis of the following. (3 Marks)

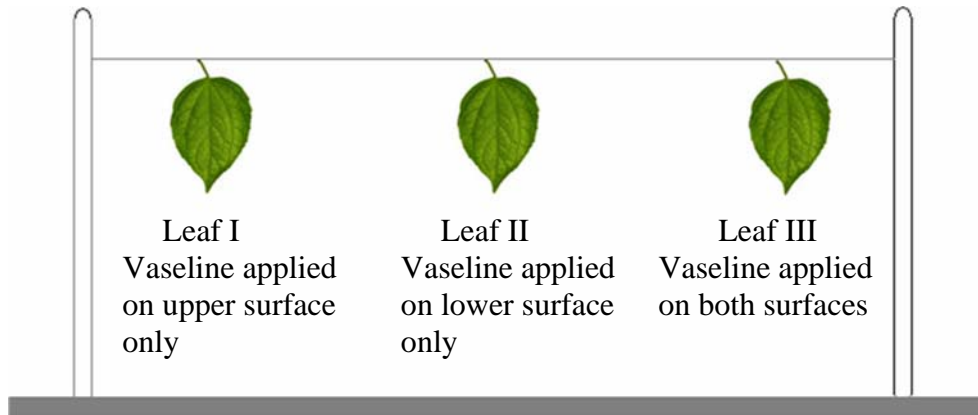
	Active Transport
Movement of Molecules	
Requirement of Energy	
Example	

Q.2.

(Total 4 Marks)

An experiment was conducted to find out the amount of water loss from two different surfaces of leaves.

The set up of the experiment is shown below.



The results of the experiment are as follows.

Leaf No.	Initial Mass/g	Final Mass/g	Difference in Mass/g
I	3.5	2.1	1.4
II	3.5	3.0	0.5
III	3.5	3.5	0.0

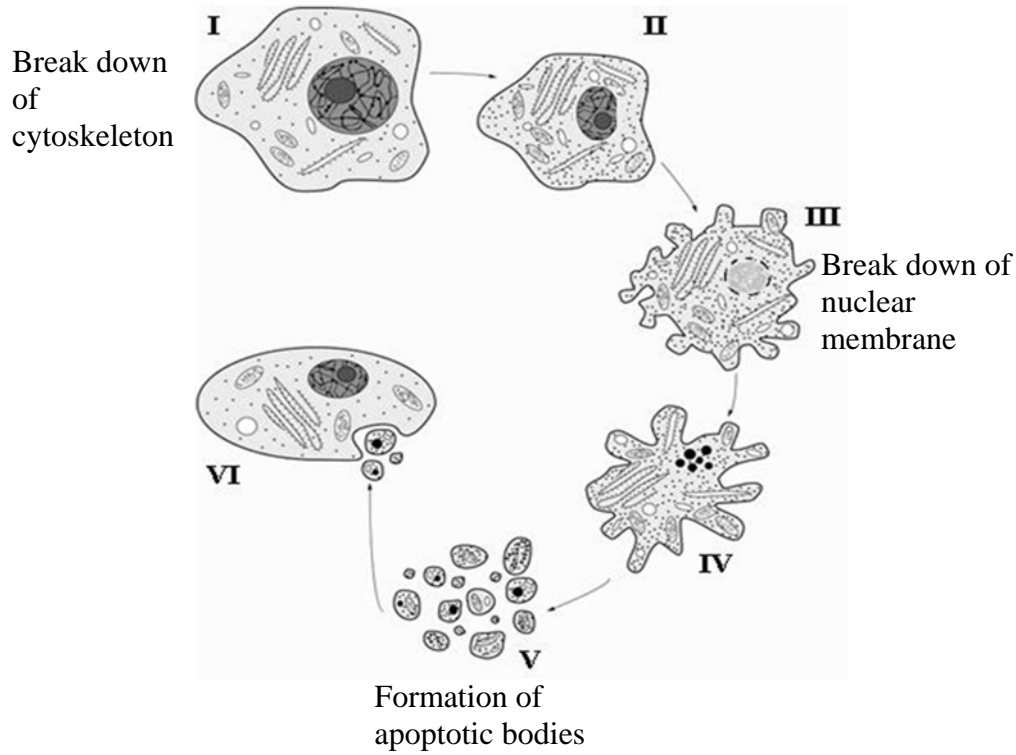
a. What is the purpose of leaf III in this experiment? (1 Mark)

b. Based on the given results, draw the conclusion for this experiment. (3 Marks)

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Q.3. (Total 3 Marks)

The given diagram shows some events of apoptosis. Briefly describe what happens at stages II, IV and VI.



Stage II: _____

Stage IV: _____

Stage VI: _____

Q.4.

(Total 2 Marks)

What happens to the amount of enzyme at the end of a chemical reaction? Why does it happen?

PLEASE TURN OVER THE PAGE

Q.5. (Total 6 Marks)

a. Briefly describe the synthesis of NADPH in the light reaction of photosynthesis. (3 Marks)

b. Complete the given table by providing required information about peptic ulcer. (3 Marks)

	Peptic Ulcer
Symptom	
Cause	
Treatment	

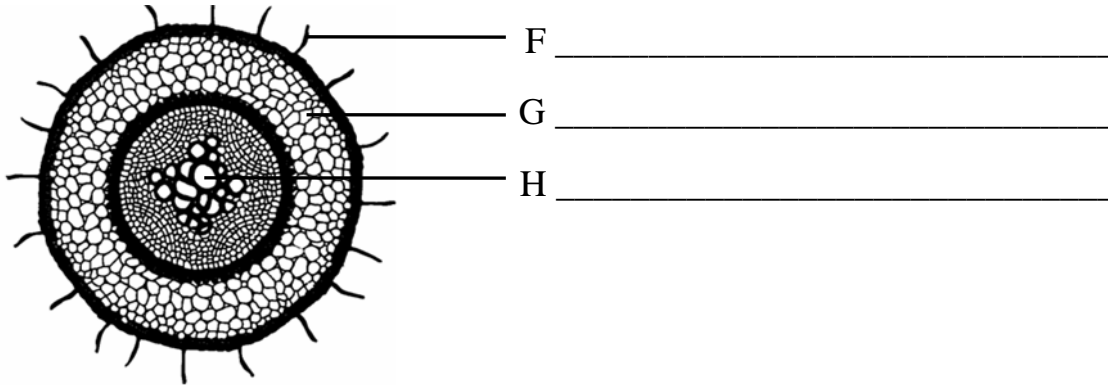
Q.6.

(Total 5 Marks)

The diagram shows the internal structure of root.

a. Identify structures F, G and H.

(3 Marks)



b. What is the role of structure F in plants?

(2 Marks)

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

MAY 2014

Biology Paper II

Time: 2 hours 25 minutes Marks: 40

INSTRUCTIONS

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1. Check your name and school information. Sign if it is accurate.

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Q.1. (Total 5 Marks)

a. Briefly describe how the knowledge of biology can improve the yield of the fishing industry. (3 Marks)

b. How is turgor important to plants? (2 Marks)

Q.2. (Total 4 Marks)

It is said, '*Papaya contains an enzyme which digests proteins.*'

Write a set of instructions (procedure) to test the given hypothesis. Your answer should include a 'control set-up'.

Q.3.

(Total 3 Marks)

What may happen if G1 phase of the interphase of cell cycle does not take place?

Q.4.

(Total 2 Marks)

Name any TWO intracellular enzymes in our body.

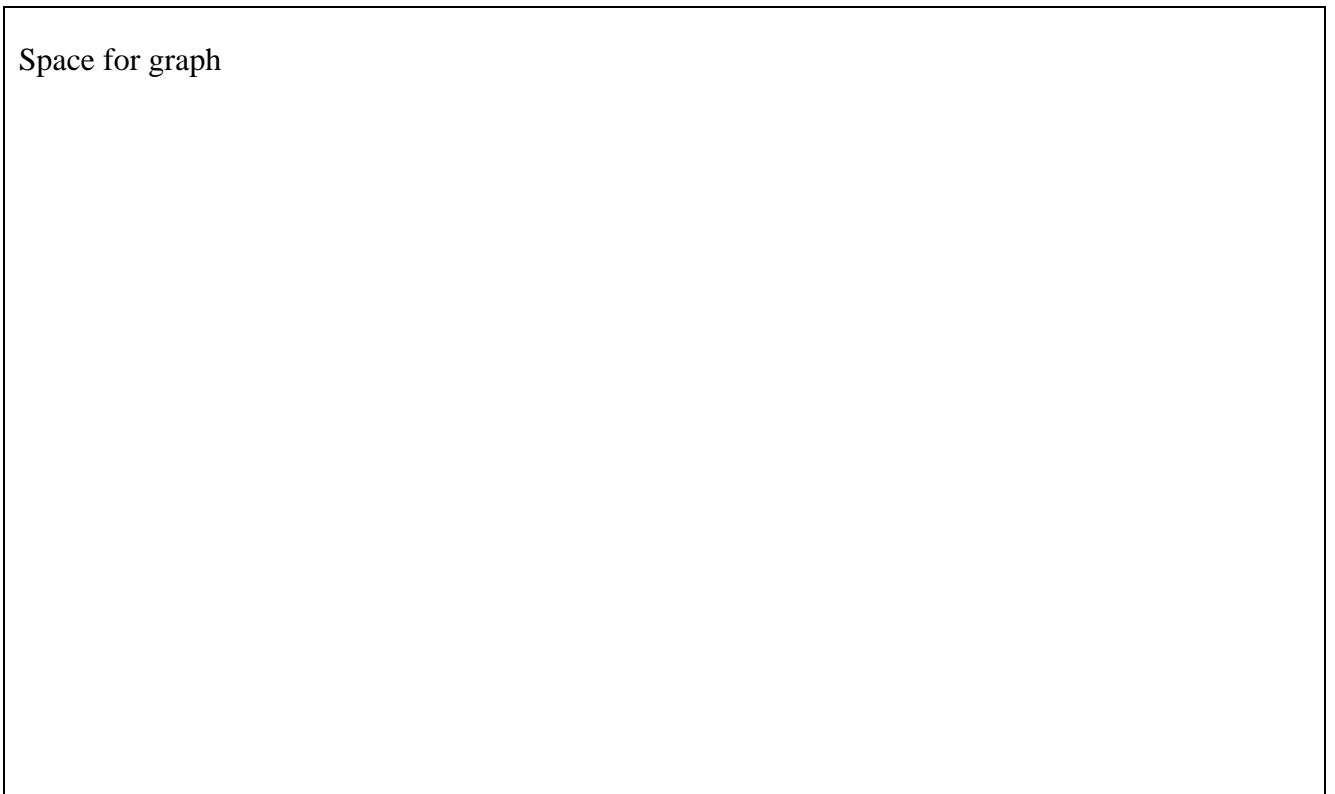
Q.5.

(Total 6 Marks)

a. With the help of a labelled graph ONLY show the effect of light intensity on the rate of photosynthesis.

(3 Marks)

Space for graph



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b. The table shows the composition of diet of different vulnerable groups. (3 Marks)

Group	Diet
Child (4-6 years)	Meat, egg, rice and potato
Adult (above 50)	Fish, apple, bread and spinach
Labourer	

- i. Why are the dietary requirements of a child different from those of an adult?
- ii. Complete the given table by inserting the dietary requirements of a labourer.

Q.6. (Total 5 Marks)

a. Give an account of the effect of increased humidity on the rate of transpiration. (2 Marks)

b. State the causes of leukaemia and thalassemia. Also mention the treatment for these diseases. (3 Marks)

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

MAY 2015

Biology Paper II

Time: 2 hours 25 minutes Marks: 40

INSTRUCTIONS

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4. The marks for the questions are shown in brackets ().

Q.1. (Total 5 Marks)

a. How is the study of the following branches of biology significant to us? (2 Marks)

i. Histology _____

ii. Taxonomy _____

b. State any THREE salient features of the animal shown in the diagram below. (3 Marks)



Q.2.

(Total 4 Marks)

The data below shows the effect of different concentrations of zinc on the activity of an enzyme.

S. No.	Zinc Concentration ($\mu\text{g/litre}$)	Rate of Enzyme Activity (Units of product produced per hour)
1	1	4
2	2	4
3	3	3.5
4	4	2

Present the given information in the form of a graph with labelled x-axis and y-axis.

Space for graph

Q.3.

(Total 3 Marks)








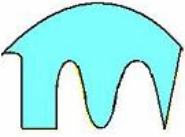
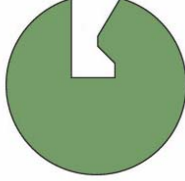
State any THREE differences between mitosis and meiosis.

S.No.	Mitosis	Meiosis
1		
2		
3		

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Q.4. (Total 2 Marks)

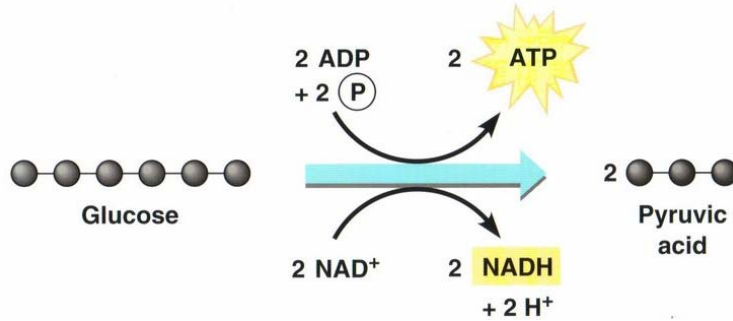
For each substrate in column II, identify and state the enzyme from column I that would act on it.

Column I	Column II
Enzyme	Substrate
<p>1</p> 	 <p>_____</p>
<p>2</p> 	 <p>_____</p>
<p>3</p> 	 <p>_____</p>
<p>4</p> 	 <p>_____</p>
<p>5</p> 	<p>_____</p>

Q.5.

(Total 3 Marks)

The equation below shows part of a biochemical process.



a. Identify the process.

(1 Mark)

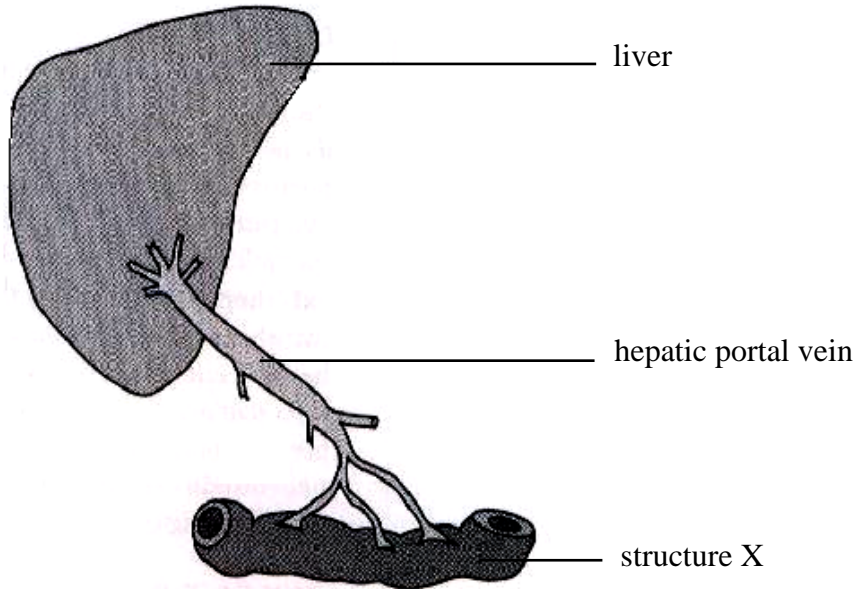
b. In which part of the cell does this process take place? Give ONE reason why it would take place in this particular part of the cell.

(2 Marks)

PLEASE TURN OVER THE PAGE

Q.6. (Total 3 Marks)

The digested food in structure X is absorbed by the blood and taken away by the hepatic portal vein to the liver.

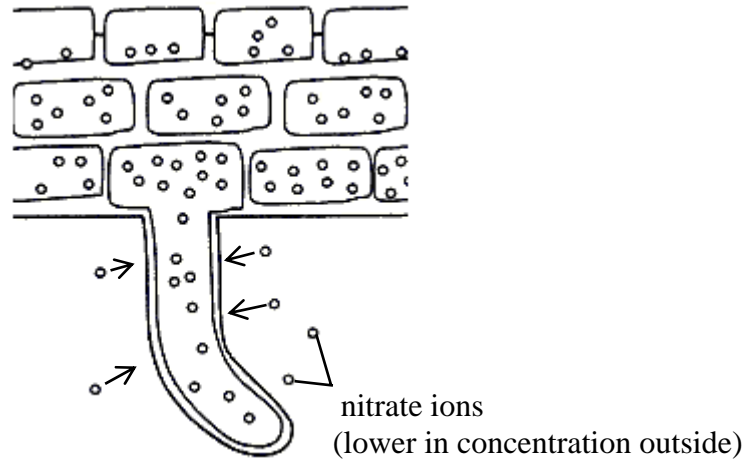


Identify structure X in the given diagram. Also describe what happens to excess amino acids in the liver before the blood is distributed around the body.

Q.7.

(Total 5 Marks)

- a. The diagram below shows a root hair cell and its adjacent cells. Identify and describe the process through which plants take up the given ions from the soil. (3 Marks)



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- b. The pictures below show two factors contributing to famine (shortage of food). Describe any ONE of them. (2 Marks)



Picture 1



Picture 2

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

MAY 2016

Biology Paper II

Time: 2 hours 25 minutes Marks: 40

INSTRUCTIONS

Please read the following instructions carefully.

1. Check your name and school information. Sign if it is accurate.

**I agree that this is my name and school.
Candidate's signature**

2. RUBRIC. There are NINE questions. Answer ALL questions. Questions 8 and 9 each offer TWO choices. Attempt any ONE choice from each.
3. When answering the questions:

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Use a black pencil for diagrams. DO NOT use coloured pencils.
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Complete your answer in the allocated space only. DO NOT write outside the answer box.
4. The marks for the questions are shown in brackets ().

Q.1. (Total 5 Marks)

a. Complete the given table by identifying the branch of biology with respect to its significance. (3 Marks)

Significance of the Branch of Biology	Name of the Branch of Biology
This branch of biology helps scientists to propose appropriate habitat for the living organisms and find out ways to reduce different types of pollution.	
This branch of biology enables scientists to make use of living organisms for the benefits of mankind, e.g. production of bio-fuel.	
This branch of biology supports scientists to find out the evolutionary relationships between different organisms on the basis of dead remains.	

b. Which TWO structural features of a fish enable it to survive in water? (2 Marks)

Q.2. (Total 4 Marks)

a. What would a scientist do if his hypothesis is: (2 Marks)

Supported by experimentation _____

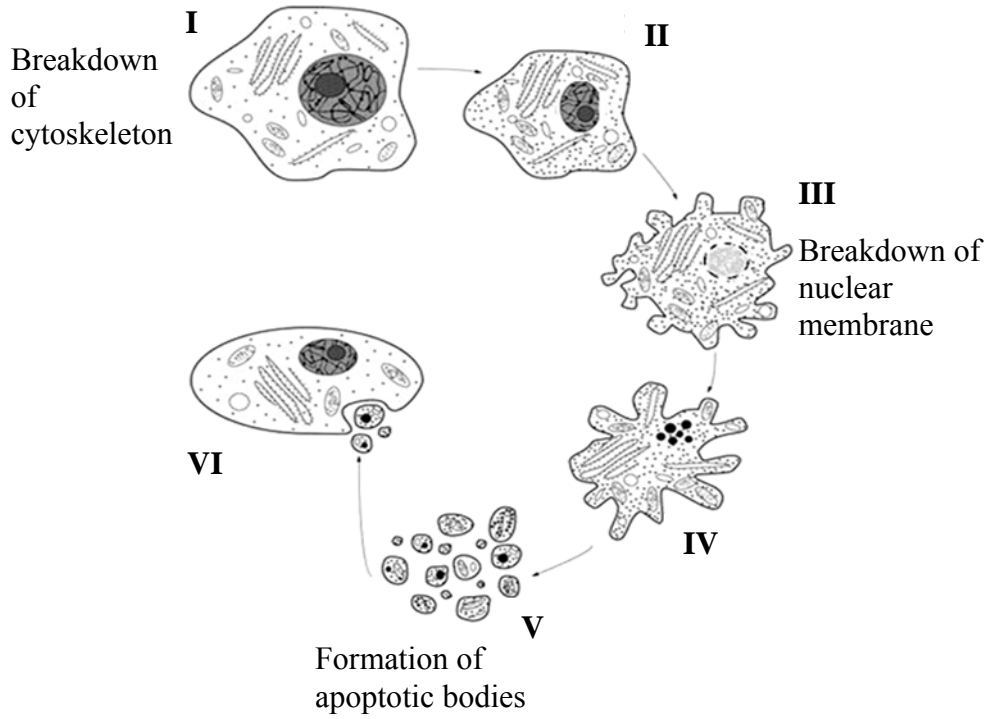
Not supported by experimentation _____

b. 'Use of diagrams in teaching biology improves conceptual understanding of students.'
Draw deduction from the given hypothesis. (2 Marks)

Q.3.

(Total 3 Marks)

The given diagram shows some events of apoptosis. Briefly describe what happens at stages **II**, **IV** and **VI**.



Stage **II**: _____

Stage **IV**: _____

Stage **VI**: _____

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Q.4. (Total 2 Marks)

Hydrogen peroxide is broken down into water and oxygen. The breakdown of hydrogen peroxide can take less time if catalase is used.

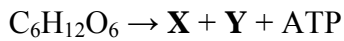
Identify the following for the given chemical reaction.

Enzyme: _____

Substrate: _____

Q.5. (Total 3 Marks)

The given reaction takes place in yeast.



i. Identify products **X** and **Y**. (2 Marks)

ii. In which part of the yeast cell does this reaction occur? (1 Mark)

Q.6. (Total 3 Marks)

Complete the given table.

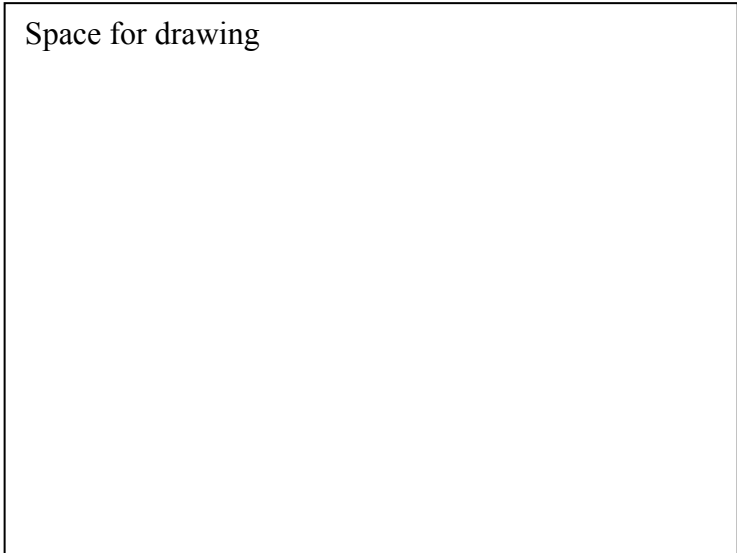
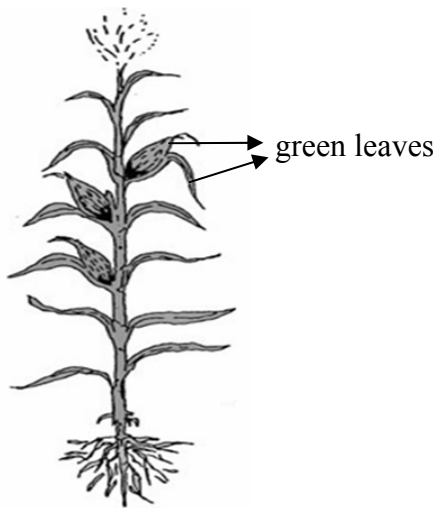
Blood Vessel	Origin	Target Organ
Hepatic Vein		
Renal Artery		Kidneys
Pulmonary Artery	Heart	Lungs

Q.7.

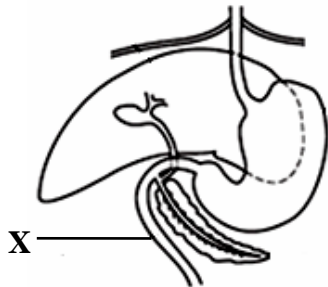
(Total 5 Marks)

- a. The diagram shows a plant which receives appropriate amount of macro-nutrients and micro-nutrients.

Redraw the diagram of the plant showing the effects of deficiency of nitrogen and magnesium. (2 Marks)



- b. The diagram shows some parts of the human digestive system.



Briefly describe how the THREE enzymes entering into region X of the alimentary canal help in the digestion of food. (3 Marks)

PLEASE TURN OVER THE PAGE

Q.8. (Total 7 Marks)

EITHER

- a.
 - i. Define anatomy.
 - ii. Explain how studying immunology and morphology help scientists in the prevention and treatment of various diseases.

OR

- b.
 - i. What are meristematic tissues?
 - ii. Describe structural adaptations in any **THREE** of the permanent tissues in plants that help to perform their function efficiently.

Q.9. (Total 8 Marks)

EITHER

a. Describe the role of chlorophyll, water and NADPH in the conversion of light energy to chemical energy in plants.

OR

b. The table below gives information about the donor's and recipient's blood groups in case of two different blood transfusions.

Blood Transfusion	Donor's Blood Group	Recipient's Blood Group
Case I	A	AB
Case II	B	O
Case III	O ⁺	?

- i. Explain the results of blood transfusion in cases **I** and **II** shown above.
- ii. What are the possible recipients of O⁺ blood in case **III**? Give a reason to support your answer.

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

APRIL/ MAY 2017

Biology Paper II

Time: 2 hours 25 minutes Marks: 40

INSTRUCTIONS

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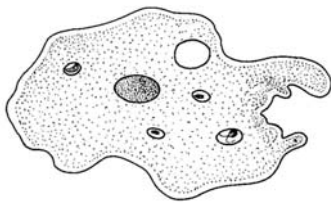
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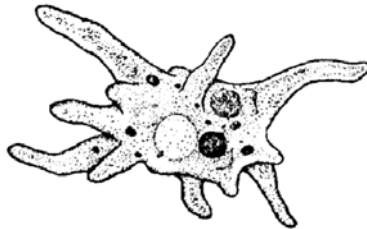
Q.1. (Total 5 Marks)

a. Describe the relationship of biology with geography using an example. (2 Marks)

b. The given diagrams show two amoebae of similar size. (3 Marks)



I



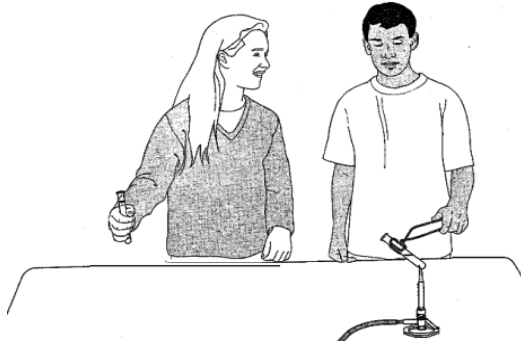
II

Which of the two amoebae will have greater surface area to volume ratio? Support your answer with suitable description.

Q.2.

(Total 4 Marks)

a. The given diagram shows two students working in the biology laboratory.

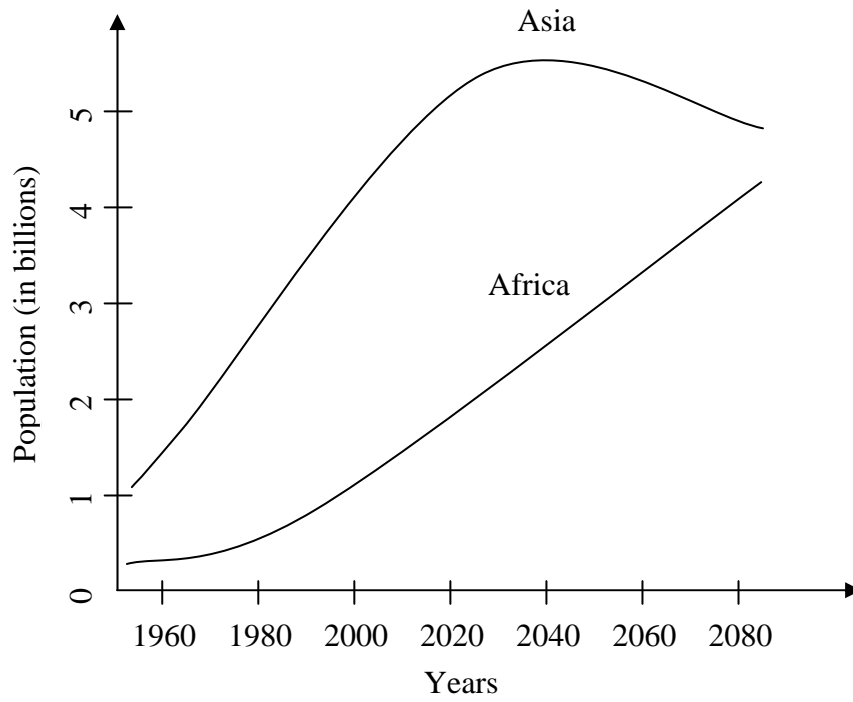


Identify any TWO safety measures that the students have NOT taken while working in the laboratory. (2 Marks)

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b. The given graph shows the population growth of two different continents.

(2 Marks)

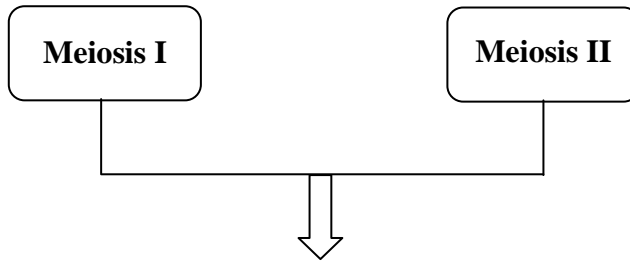


Interpret the graph referring to the population of Asia and Africa.

Q.3.

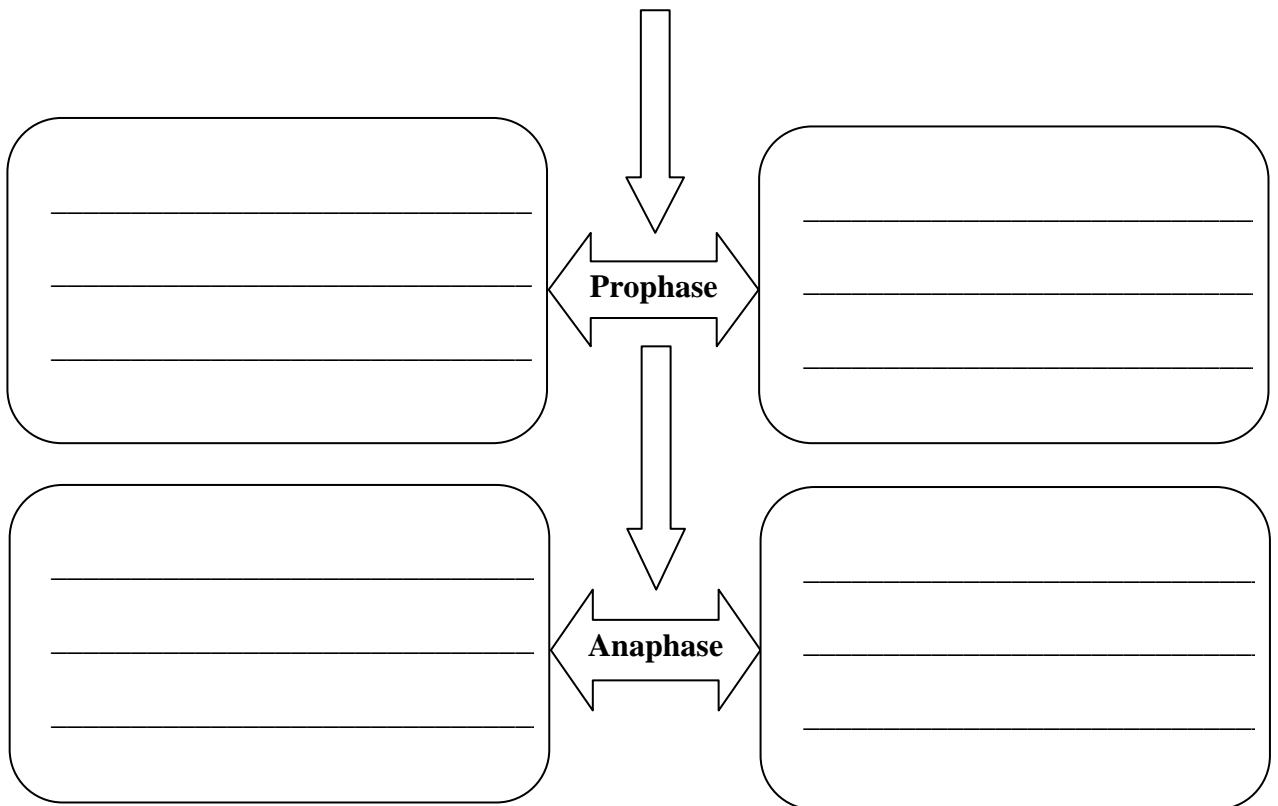
(Total 3 Marks)

Complete the given flow chart of meiosis.



ONE similarity with reference to Telophase

ONE difference each with reference to prophase and anaphase



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Q.4. (Total 2 Marks)

Mention the general properties of enzymes for the given examples.

Example	Property
2 mg lipase is required to digest 200 g or 400 g of lipids.	
Magnesium is required for the proper functioning of ATPase.	

Q.5. (Total 3 Marks)

A student takes rest after a strenuous exercise. While resting, the lactic acid produced in the student's muscles during exercise is converted into glucose.

Outline the process of conversion of lactic acid into glucose.

Q.6. (Total 3 Marks)

State the source of the given digestive juice and name ONE enzyme present in each juice.

Digestive Juice	Source	Enzyme
Gastric juice	Gastric gland	
Bile juice		

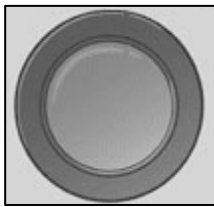
Q.7.

(Total 5 Marks)

a. State any TWO functions of carbohydrates in plants.

(2 Marks)

b. The given diagrams show cross-sections of arteries.



I. Normal Artery



II. Diseased Artery

i. Identify the disease shown in diagram **II**.

(1 Mark)

ii. Mention any TWO factors that lead to the diseased condition of the artery as shown in diagram **II**.

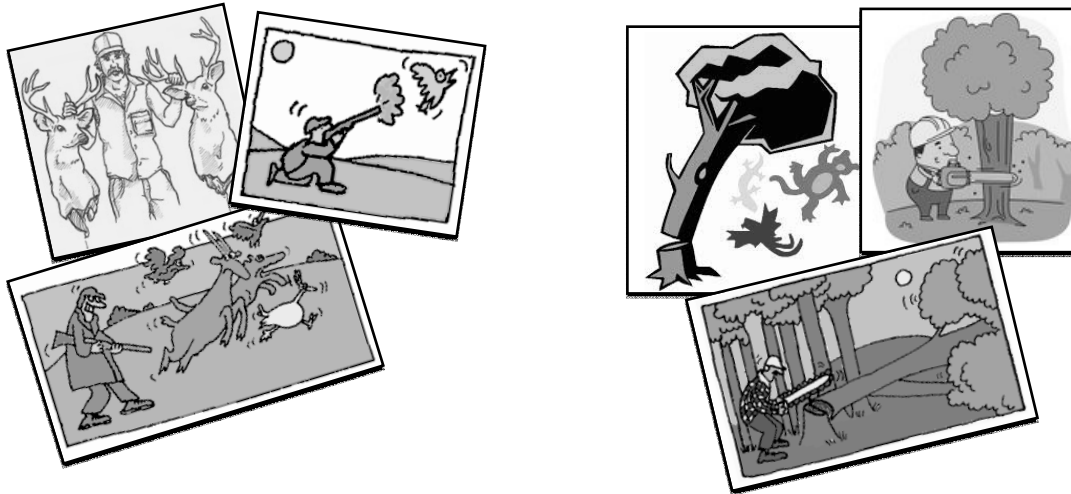
(2 Marks)

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Q.8. (Total 7 Marks)

EITHER

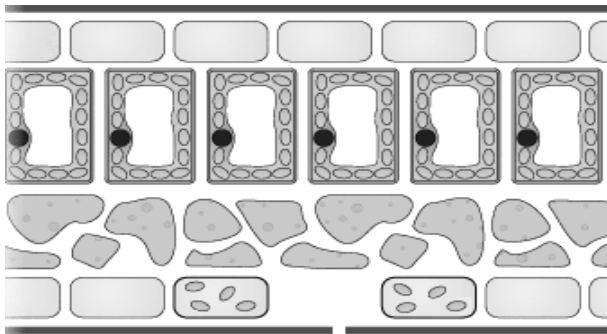
a. The given diagrams represent two human activities which cause imbalance in nature.



Describe the given human activities and their impact in bringing imbalance in nature with reference to biodiversity.

OR

b. The given diagram shows the cross-section of a leaf.



- i. What is the function of network of veins in the leaf? (1 Mark)
- ii. Describe the structural adaptation and advantages of any THREE features present in the cross-section of the leaf shown in the given diagram. (6 Marks)

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

APRIL/ MAY 2018

Biology Paper II

Time: 2 hours 25 minutes Marks: 40

INSTRUCTIONS

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4. The marks for the questions are shown in brackets ().

Q.1. (Total 5 Marks)

a. Identify the branch of science that shows relationship with biology in the given examples. (2 Marks)

S. No.	Example	Branch of Science
1	Students of grade IX measured the heights of 50 individuals in their class and represented the data in the form of a bar graph.	
2	In Pakistan, the total value of fish export for the years 2014 and 2015 was US\$ 253.497 million.	

b. State any THREE salient features of prokaryotes. (3 Marks)

Q.2.

(Total 4 Marks)

Fahad conducts an experiment to investigate the effect of humidity on the rate of transpiration in plants. After a week, he records the following data.

Day	Humidity (%)	Transpiration Rate (g/m ² /hr)
1	40	198
2	61	188
3	62	186
4	75	150
5	78	80
6	80	60
7	88	57

a. Present the given data in the form of a graph.

(3 Marks)

Space for graph

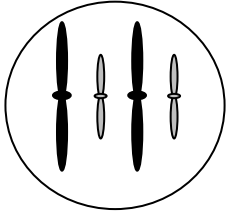
b. What result can be concluded from the given data?

(1 Mark)

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Q.3. (Total 3 Marks)

The given diagram shows a cell with four chromosomes.

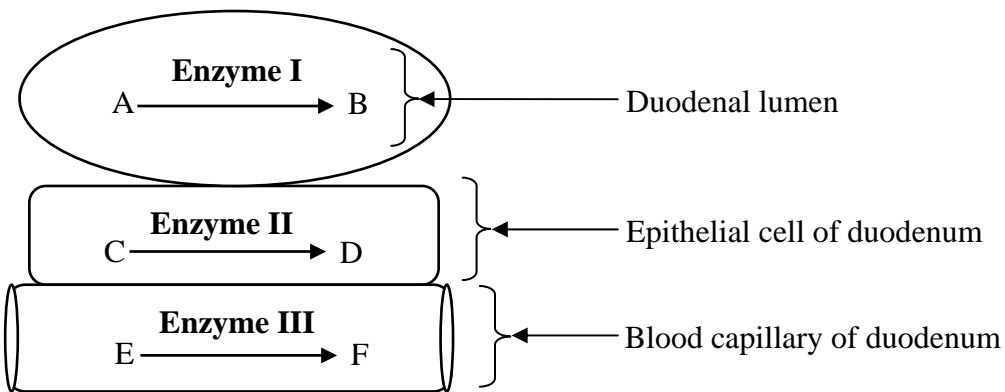


Draw the condition of chromosomes of the given cell during **prophase I**, **metaphase I** and **metaphase II** when this cell undergoes meiosis.

Prophase I	Metaphase I	Metaphase II

Q.4. (Total 2 Marks)

The given diagram illustrates the activity of three enzymes in the duodenum of human beings.



Classify the enzymes, **I**, **II** and **III**, as intracellular or extracellular.

Intracellular Enzyme	Extracellular Enzyme

Q.5.

(Total 3 Marks)

List any THREE factors that affect the rate of photosynthesis in plants.

Q.6.

(Total 3 Marks)

Mention any THREE protective functions of blood against diseases in the human body.

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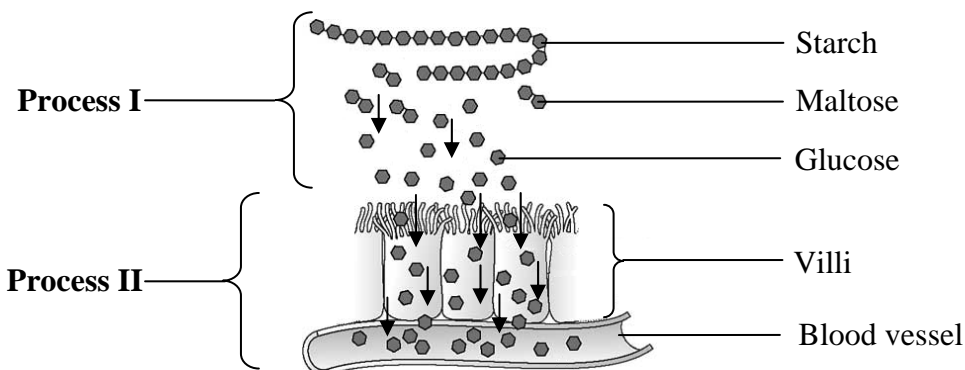
Q.7. (Total 5 Marks)

a. The given table shows the percentage of nutrients present in two food items.

Food Item	Protein (%)	Fat (%)	Fibre (%)
I	13	11	24
II	7	18	6

Which of the food items, **I** or **II**, would provide more energy? Support your answer with a suitable reason. (2 Marks)

b. The given diagram illustrates two processes occurring in the small intestine of human beings.



i. Identify the processes, **I** and **II**. (2 Marks)

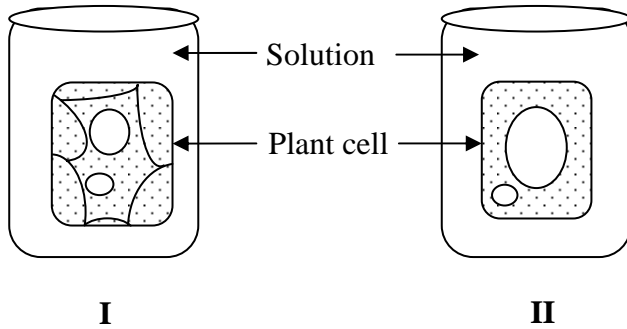
ii. What is the significance of villi for process **II**? (1 Mark)

Q.8.

(Total 7 Marks)

EITHER

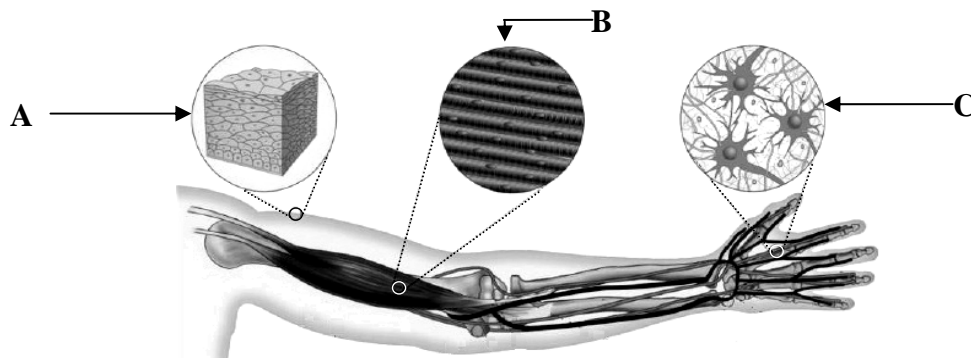
a. The given diagrams, **I** and **II**, show the effect of different solutions on plant cells.



- i. What is meant by tonicity? (1 Mark)
- ii. Explain the effect of the solution on the cell in each case with reference to osmosis. (6 Marks)

OR

b. The given diagram shows different types of tissues present in the human arm.



- i. State any ONE feature of animal tissues. (1 Mark)
- ii. Describe the specificities and functions of tissues, labelled as **A**, **B** and **C** shown in the given diagram. (6 Marks)

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AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

APRIL/ MAY 2019

Biology Paper II

Time: 2 hours 15 minutes Marks: 35

INSTRUCTIONS

Please read the following instructions carefully.

1. Check your name and school information. Sign if it is accurate.

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RUBRIC

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4. The marks for the questions are shown in brackets ().

Q.1. (Total 3 Marks)

a. Differentiate between micro-molecules and macro-molecules. (1 Mark)

b. Classify the given molecules as micro-molecules or macro-molecules. (2 Marks)

- i. Starch
- ii. Water
- iii. Oxygen
- iv. Haemoglobin

Micro-molecule	Macro-molecule

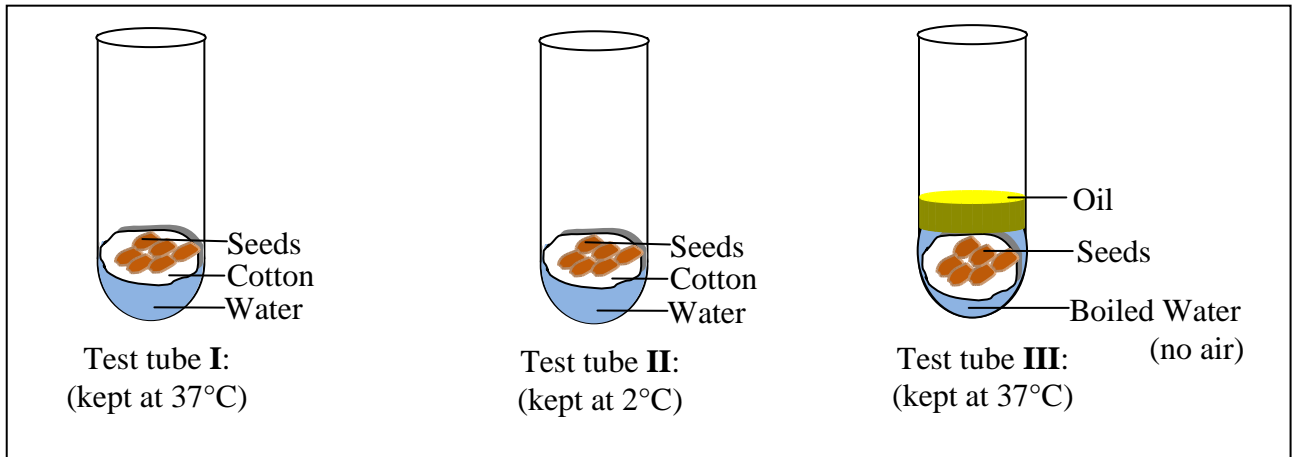
Q.2.

(Total 3 Marks)

The given diagrams show an experiment to study the conditions necessary for germination of seeds.

Expected Result:

Seeds in test tube **I** would germinate while there would be no germination in test tubes **II** and **III**.



Explain why

a. the seeds in test tube **I** would germinate.

(1 Mark)

b. the seeds in test tube **II** would not germinate.

(1 Mark)

c. the seeds in test tube **III** would not germinate.

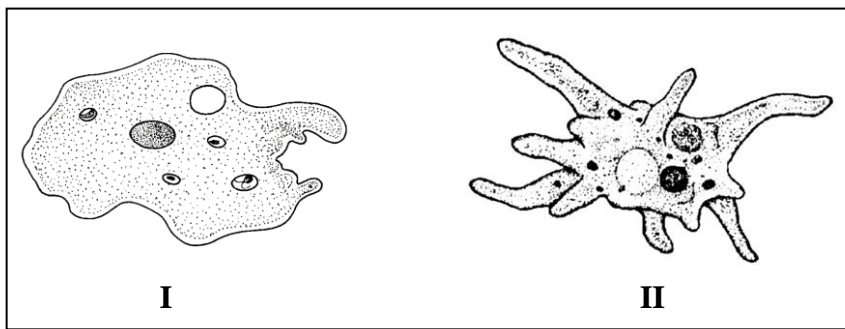
(1 Mark)

Q.3. (Total 3 Marks)

List any THREE human activities that cause deforestation.

Q.4. (Total 3 Marks)

The given diagrams show two forms of the same amoebae.



Which of the two amoebae forms, I or II, will have greater surface area? Support your answer with suitable description.

Q.5.

(Total 3 Marks)

Give ONE advantage of each of the given features of the respiratory system of human beings.

a. C-shaped rings in the walls of trachea

(1 Mark)

b. Single layer of epithelial cells in alveolar walls

(1 Mark)

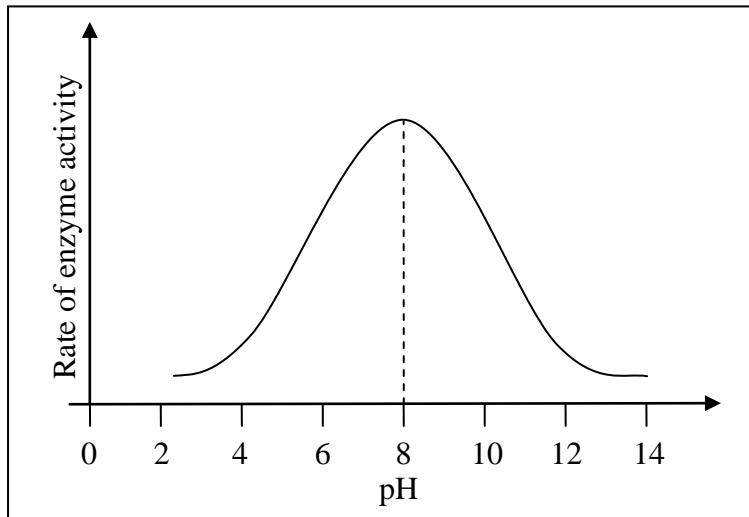
c. Mucus production in the inner walls of bronchi

(1 Mark)

Q.6.

(Total 2 Marks)

The given graph shows the activity of an enzyme in the human body at different pH.



Extract any TWO interpretations from the given graph.

PLEASE TURN OVER THE PAGE

Q.7. (Total 3 Marks)

Give reasons for the following adaptations of blood vessels.

a. Veins have valves. (1 Mark)

b. Capillaries have one-cell thick epithelium. (1 Mark)

c. Arteries have thick muscular walls as compared to veins. (1 Mark)

Q.9.

(Total 8 Marks)

EITHER

a. Describe any TWO structural features of each of the following organs of the digestive system of human beings which help them to function efficiently.

i. Stomach (4 Marks)

ii. Small intestine (4 Marks)

OR

b. In plants, water continuously moves from roots to xylem and transpires through leaves.

Explain the transportation of water in plants with reference to transpiration pull. (8 Marks)

PLEASE TURN OVER THE PAGE

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX

ANNUAL EXAMINATIONS (THEORY) 2023

Biology Paper II

Time: 1 hour 50 minutes Marks: 25

INSTRUCTIONS

Please read the following instructions carefully.

1. Check your name and school information. Sign if it is accurate.

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RUBRIC

2. There are SEVEN questions. Answer ALL questions. Questions 6 & 7 each offer TWO choices. Attempt any ONE choice from each.
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4. The marks for the questions are shown in brackets ().
5. You may use a simple calculator if you wish.

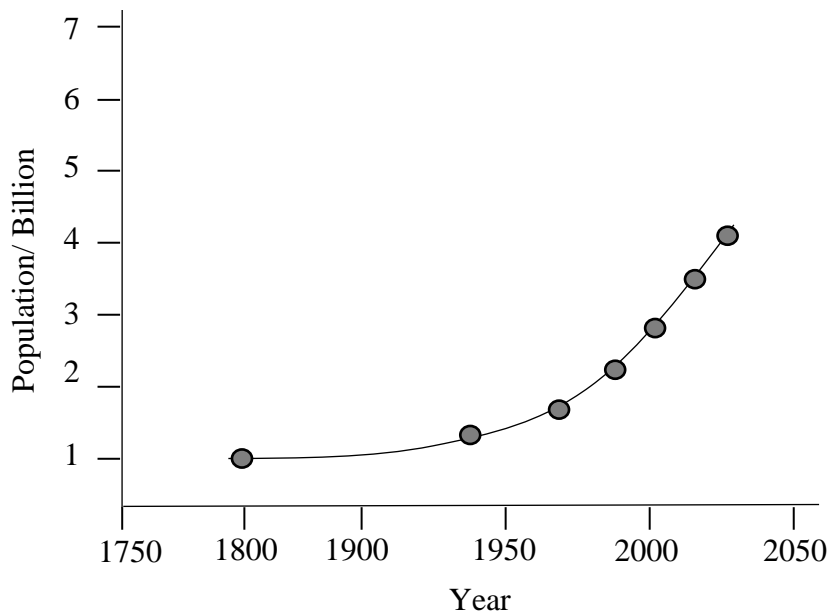
Q.1. (Total 2 Marks)

A biological research department is working on a project in which the biologists have to study the fossils, with reference to their chemical composition, origin and binomial nomenclature.

Identify any TWO branches of biology which are involved in this project.

Q.2. (Total 3 Marks)

Consider the given graph.



Using the information in the given graph,

a. identify the dependent and independent variables. (2 Marks)

Dependent variable: _____

Independent variable: _____

b. interpret the trend in population. (1 Mark)

Q.3.

(Total 3 Marks)

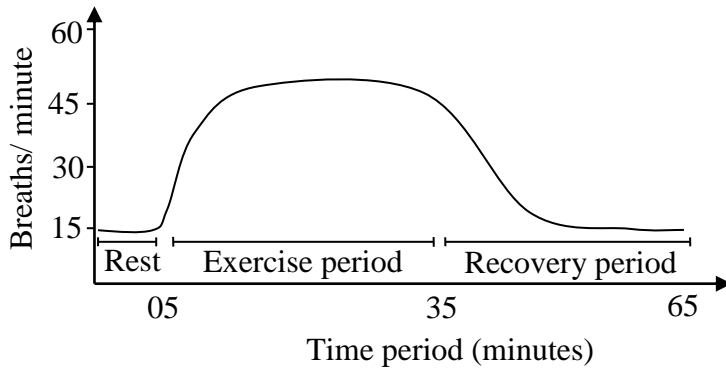
The five-kingdom classification system better explains the diversity of living organisms.

Write any THREE points to support the given statement.

PLEASE TURN OVER THE PAGE

Q.4. (Total 3 Marks)

The given graph represents the effect of exercise on breathing rate.



a. Identify the time period in which maximum amount of oxygen would be consumed by the body. (1 Mark)

b. Why does the breathing rate remain high at the beginning of the recovery period? (1 Mark)

c. Mention the physiological activity other than breathing rate that will also increase during exercise. (1 Mark)

Q.5. (Total 2 Marks)

Describe any TWO ways in which co-factors help enzymes to work effectively.

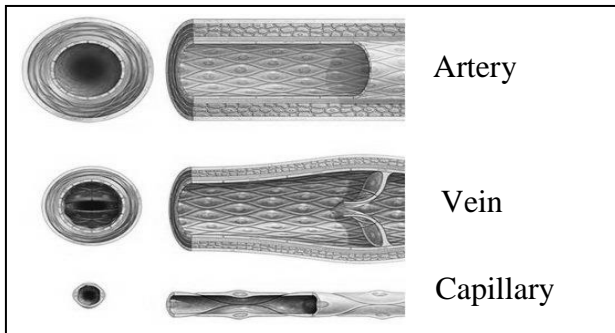
Q.7. (Total 6 Marks)

EITHER

a. Analyse how climate change can lead to famine in an area. (6 Marks)

OR

b. Each of the given blood vessels has a specialised structure which is adapted for its specific function.



i. Identify ONE structural feature of each blood vessel. (3 Marks)

ii. Describe how each structural feature identified in part i enables the respective blood vessel to perform a specific function. (3 Marks)

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX

ANNUAL EXAMINATIONS (THEORY) 2024

Biology Paper II

Time: 1 hour 50 minutes Marks: 25

INSTRUCTIONS

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RUBRIC

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4. The marks for the questions are shown in brackets ().
5. You may use a simple calculator if you wish.

Q.1. (Total 2 Marks)

Describe the concept of division of labour among the different types of cells in human trachea in any TWO points.

Q.2. (Total 3 Marks)

Shoaib conducted an experiment to determine the effect of a fertiliser on the growth of plants.

He used four pots with different species of plants and varying amounts of soil and fertiliser for his experiment. However, he could not obtain the required result.

Identify any THREE errors in his experimental set-up.

Q.3. (Total 3 Marks)

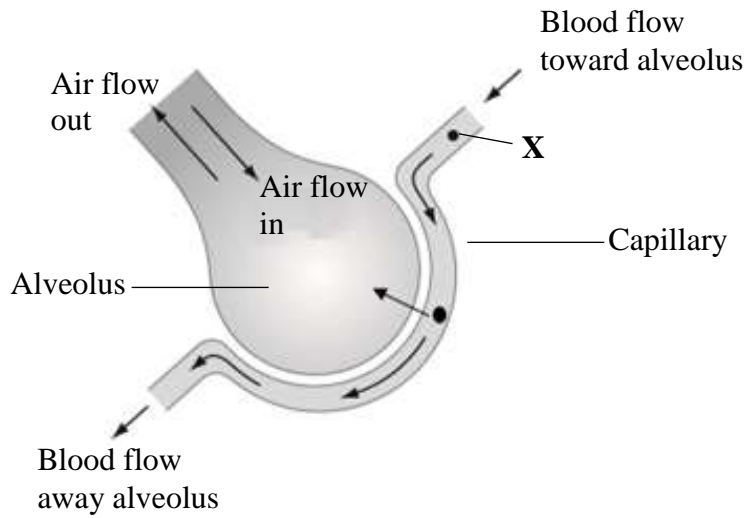
Complete the given table by mentioning the demerits of kingdom classification systems.

Classification System	Demerit
Two-kingdom classification system	1. 2.
Five-kingdom classification system	1.

Q.4.

(Total 3 Marks)

The given diagram represents an alveolus and blood capillary. **X** represents a gas molecule.



i. Identify molecule **X**. (1 Mark)

ii. What would be the effect of rigorous exercise on the concentration of molecule **X** in the human body? (1 Mark)

iii. Why is the percentage composition of molecule **X** in alveolar air different from the atmospheric air? (1 Mark)

Q.5.

(Total 2 Marks)

How can change in the pH beyond the optimum level affect the structure of enzyme?

Describe in TWO points.

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Q.7.

(Total 6 Marks)

EITHER

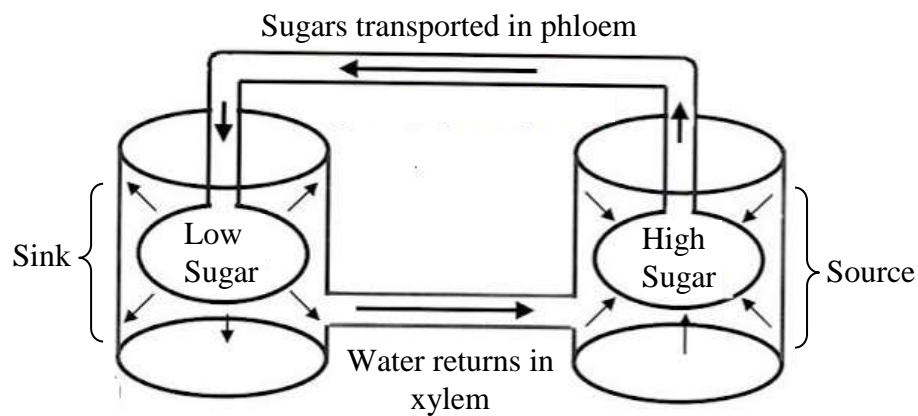
- a. Sara is 25 years old and spends most of her time studying in a library. Her brother Zia is 15 years old and spends most of his time playing with friends. They consume same quality and quantity of food. Zia is lean and Sara is overweight.

With reference to the energy requirement and consumption of both Sara and Zia,

- i. identify THREE factors that cause the difference in their weight. (3 Marks)
- ii. describe each of the factor identified in part i. (3 Marks)

OR

- b. The given schematic diagram represents one of the processes in plants.



- i. Identify the mechanism that is depicted in the given diagram. (1 Mark)
- ii. Describe the identified mechanism in FIVE points. (5 Marks)

PLEASE TURN OVER THE PAGE

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX

ANNUAL EXAMINATIONS (THEORY) 2025

Biology Paper II

Time: 1 hour 50 minutes Marks: 25

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Please read the following instructions carefully.

1. Check your name and school information. Sign if it is accurate.

**I agree that this is my name and school.
Candidate's Signature**

RUBRIC

2. There are SEVEN questions. Answer ALL questions. Questions 6 & 7 each offer TWO choices. Attempt any ONE choice from each.
3. When answering the questions:

Read each question carefully.
Use a black pointer to write your answers. DO NOT write your answers in pencil.
Use a black pencil for diagrams. DO NOT use coloured pencils.
DO NOT use staples, paper clips, glue, correcting fluid or ink erasers.
Complete your answer in the allocated space only. DO NOT write outside the answer box.
4. The marks for the questions are shown in brackets ().
5. You may use a simple calculator if you wish.

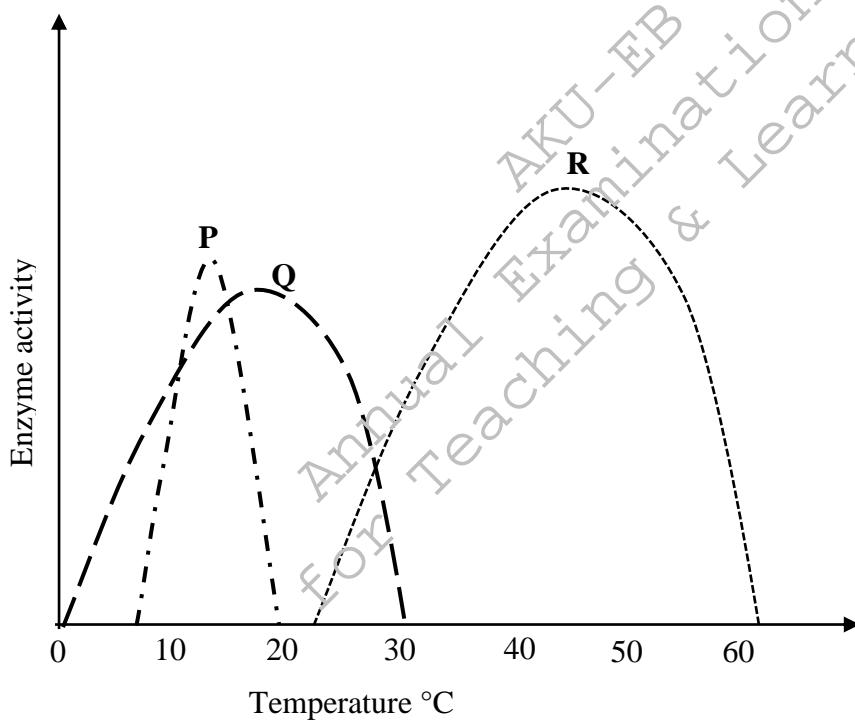
Q.1. (Total 2 Marks)

Sahiba wants to pursue animal husbandry as her field of study.

Describe how studying biology makes it easier for her to pursue her field of interest.

Q.2. (Total 3 Marks)

The given graph represents the effect of temperature on the activity of three different enzymes.



a. Interpret the curve for enzyme Q at 20°C. (1 Mark)

b. Identify the enzyme that works best at temperature above 25°C. (1 Mark)

c. Why does the curve for enzyme **R** show a fall after 45°C? (1 Mark)

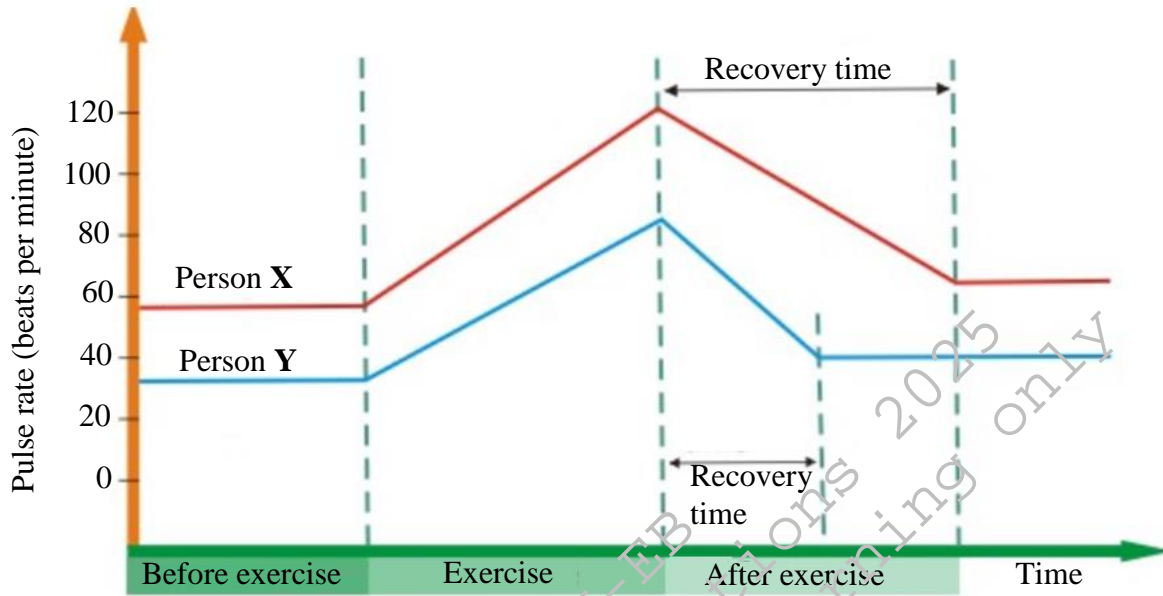
Q.3. (Total 3 Marks)

Mention any THREE drawbacks of the two-kingdom classification system.

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Q.4. (Total 3 Marks)

The given graph shows the effect of exercise on the breathing rates of persons X and Y. The breathing rate of both individuals is significantly increased.



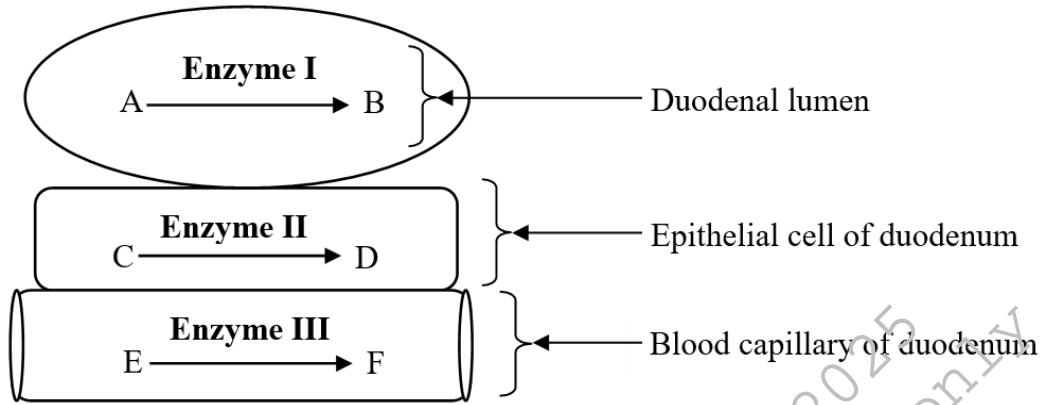
a. With reference to the given graph, identify the unfit person with a valid reason. (2 Marks)

b. Why is the increased breathing rate important for both persons, X and Y? (1 Mark)

Q.5.

(Total 2 Marks)

The given diagram illustrates the activity of three enzymes in the duodenum of human beings.



Classify the enzymes, **I**, **II** and **III**, as intracellular or extracellular.

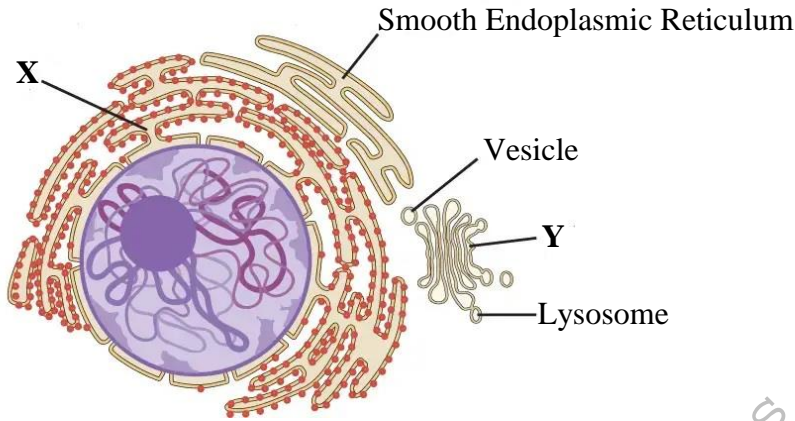
Intracellular Enzyme	Extracellular Enzyme

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Q.6. (Total 6 Marks)

EITHER

a. The given diagram shows some organelles of animal cell.



- i. Identify the labelled organelles, **X** and **Y**. (2 Marks)
- ii. Describe any ONE structural feature of each labelled organelle (**X** and **Y**). (2 Marks)
- iii. Describe the arrangement of the organelles **X** and **Y** within the cell with reference to their proximity to the nucleus and their functional interrelationship. (2 Marks)

OR

b. Compare aerobic and anaerobic respiration by mentioning any

- i. THREE similarities. (3 Marks)
- ii. THREE differences. (3 Marks)

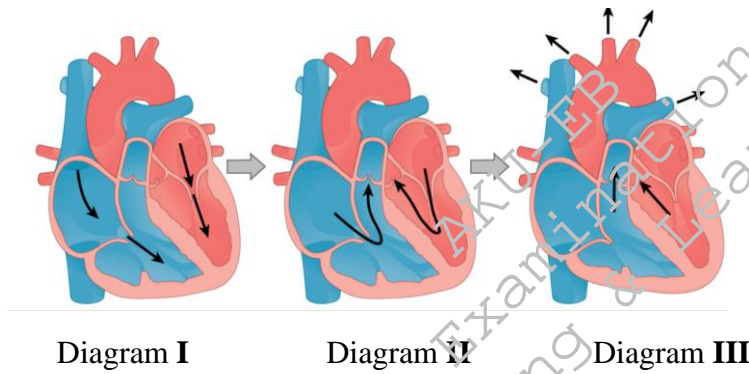
Q.7. (Total 6 Marks)

EITHER

- a. The ultrasound report of a patient’s stomach indicates the failure of closure of both the esophageal sphincter (cardiac sphincter) and pyloric sphincter.
 - i. Describe the effect of the given medical condition on the flow of food digestion. (2 Marks)
 - ii. Write ONE symptom each associated with the malfunctioning of both the sphincters. (2 Marks)
 - iii. Describe the process of peristalsis in moving the bolus through the esophagus. (2 Marks)

OR

b. The given diagrams show the flow of blood in different chambers of the human heart.



Describe each diagram with reference to the state of chambers and the flow of blood. (6 Marks)

AGA KHAN UNIVERSITY EXAMINATION BOARD
SECONDARY SCHOOL CERTIFICATE
CLASS IX
MODEL EXAMINATION PAPER 2026 AND ONWARDS
Biology Paper II
Time: 1 hour 50 minutes Marks: 25

INSTRUCTIONS:

1. Check your name and school information above. Sign if the information is correct.

I agree that this is my name and school.
Candidate's Signature

2. Read each question carefully.
3. There are EIGHT questions in this exam. Answer ALL questions. Questions 7 and 8 each offer TWO choices. For each of these questions, attempt ONE choice only.
4. When answering the questions:
 - Use a black pen/ pointer to write your answers. DO NOT write your answers in pencil.
 - Use a black pencil for diagrams and drawings. DO NOT use coloured pencils, markers or highlighters.
 - DO NOT use staples, paper clips, glue, correcting fluid, or ink erasers.
If you make a mistake, cross it out neatly and write the correct answer beside it.
 - Write your answers only in the allocated space provided for each question.
 - DO NOT write outside the answer space. Answers written outside the allocated space will not be marked.
5. The marks for each question are shown in brackets () next to the question number. Use this information to manage your time efficiently.
6. DO NOT mention your name or school name anywhere inside the paper.
7. You may use a simple calculator if you wish.

Q.1. (Total 2 Marks)

Complete the following table by identifying the branches of biology based on each of the given significances.

Significance of the Branch of Biology	Name of the Branch of Biology
This branch of biology helps scientists to propose appropriate habitat for the living organisms and find out ways to reduce different types of pollution.	
This branch of biology allows scientists to determine the age of fossils and construct timelines for evolutionary changes.	

Q.2. (Total 2 Marks)

Fahad conducts an experiment to investigate the effect of humidity on the rate of transpiration in plants. He records the daily atmospheric humidity and the rate of transpiration in his experimental plant.

The given table shows the data he records for a week.

Day	Humidity (%)	Transpiration Rate (g/m ² /hr)
1	40	198
2	61	188
3	62	186
4	75	150
5	78	80
6	80	60
7	88	57

Construct a line graph to represent the given data.

Space for graph

Q.3.

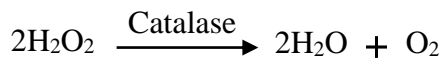
(Total 2 Marks)

Why are bacteria classified under kingdom monera? Give TWO reasons.

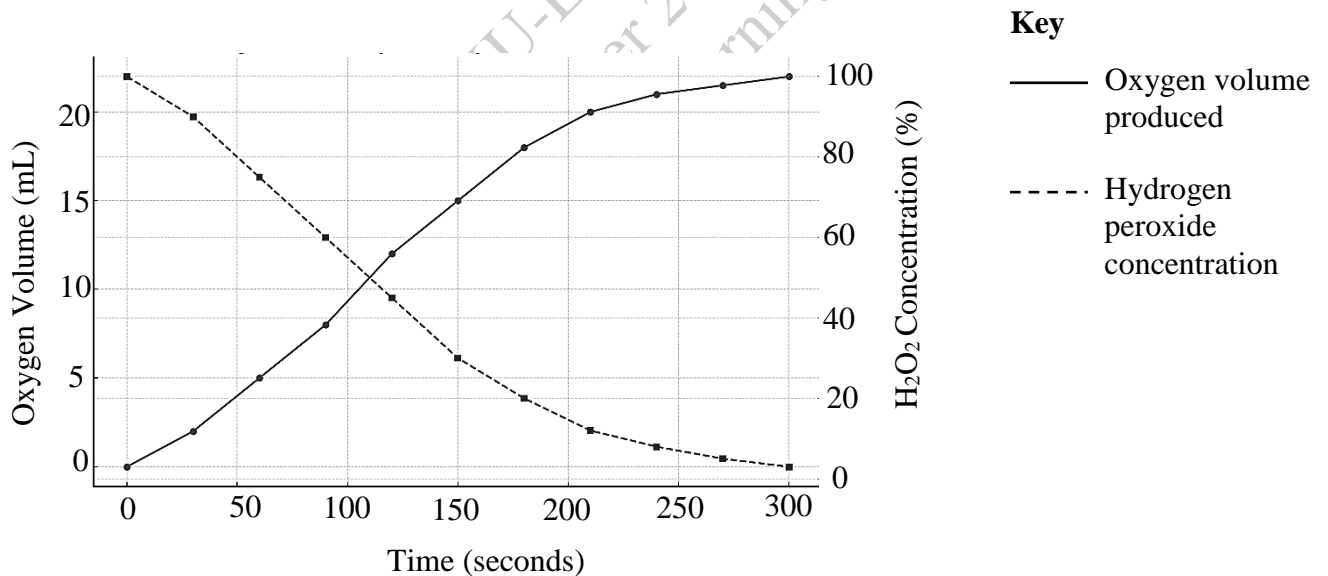
Q.4.

(Total 2 Marks)

Consider the given equation of decomposition of hydrogen peroxide by catalase enzyme.



The given graph shows the progression of this enzyme-catalysed reaction.



a. At what time does the rate of reaction begin to slow down?

(1 Mark)

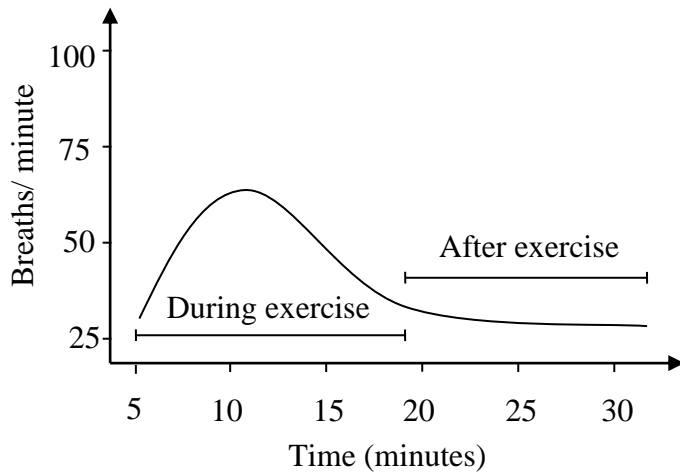
b. Why does the rate of reaction become slow?

(1 Mark)

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Q.5. (Total 3 Marks)

The given graph shows the breathing rate (breaths per minute) of an individual during and after exercise.

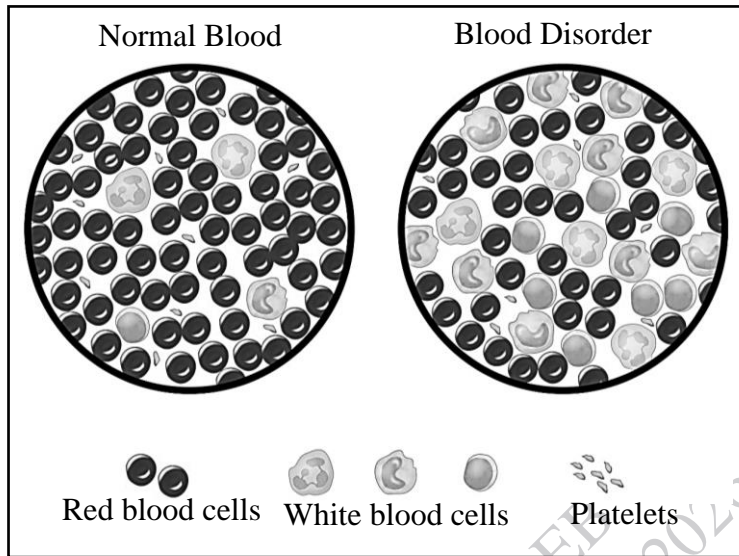


- a. Locate the point on the graph where lactic acid production is the HIGHEST. (1 Mark)
- b. Why is the breathing rate of the individual higher during exercise between 10 to 12 minutes? Give any TWO reasons. (2 Marks)

Q.6.

(Total 2 Marks)

The given diagram shows a normal blood sample and a sample from a patient with a blood disorder as seen under a microscope.



Based on the information in the given diagram,

a. identify the blood disorder.

(1 Mark)

b. write ONE likely effect of the blood disorder on the patient.

(1 Mark)

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Q.8. (Total 6 Marks)

EITHER

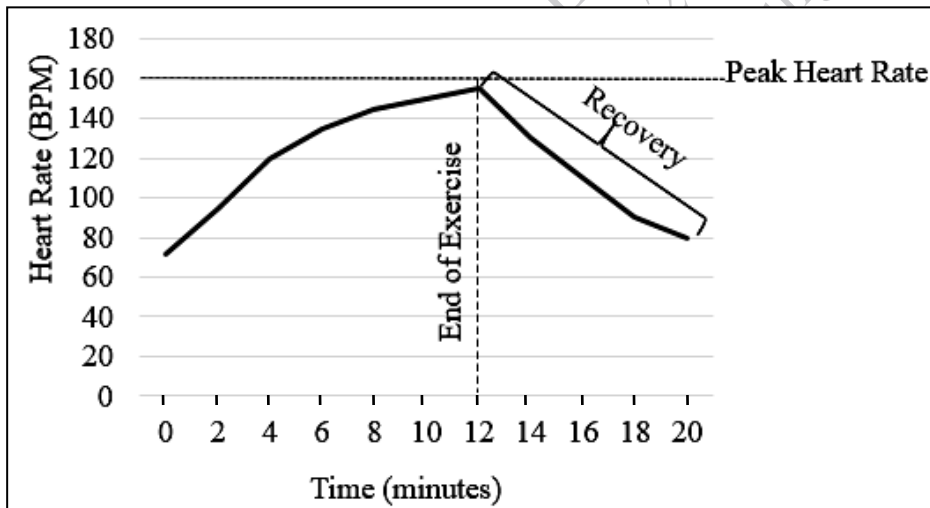
a. A patient with vitamin deficiencies is experiencing fatigue, weakened immune function and delayed wound healing.

Based on the given symptoms,

- i. name any TWO vitamins that are deficient in the patient. (2 Marks)
- ii. recommend any TWO dietary modifications that would help to overcome the vitamin deficiencies named in part 'i'. (2 Marks)
- iii. justify your recommendations in part 'ii' with reference to each dietary modification. (2 Marks)

OR

b. The given graph shows the effect of exercise on heart rate in beats per minute (BPM) over time.



- i. Based on the graph, how quickly does the heart rate recover after exercise? (2 Marks)
- ii. If a person with compromised cardiovascular health performed the same exercise, how might their heart rate and recovery time differ? (2 Marks)
- iii. If another person's resting heart rate is 60 BPM instead of 72 BPM, how would their exercise-induced heart rate response compare to this graph? (2 Marks)
