

**AGA KHAN UNIVERSITY EXAMINATION BOARD**

**HIGHER SECONDARY SCHOOL CERTIFICATE**

**CLASS XII EXAMINATION**

**APRIL/ MAY 2019**

**Biology Paper II**

**Time: 2 hours 15 minutes    Marks: 55**

**INSTRUCTIONS**

**Please read the following instructions carefully.**

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

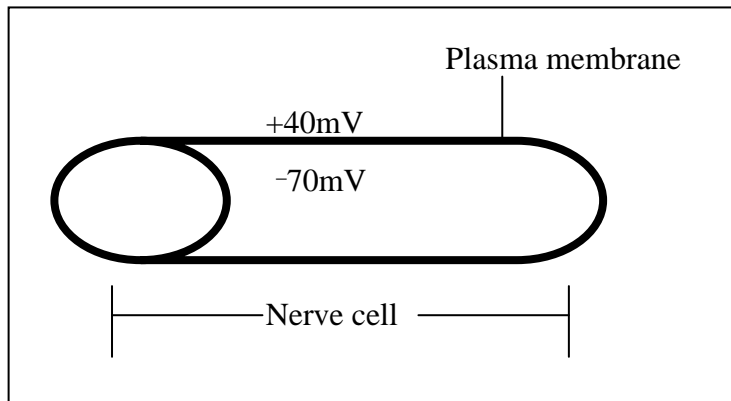
**I agree that this is my name and school.  
Candidate's Signature**

**RUBRIC**

2. There are ELEVEN questions. Answer ALL questions. Questions 10 and 11 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 ( ).

Q.1. (Total 4 Marks)

Potential difference across plasma membrane of an unstimulated nerve cell is shown in the given diagram.



- a. Describe any TWO factors that are responsible for maintaining potential difference across the plasma membrane of a neuron. (2 Marks)

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- b. Procaine is used to cause insensitivity to pain during dental surgeries. This drug acts by blocking the opening of voltage gated sodium channels in the neurons.

How does blockage of sodium channels cause anaesthesia (in-sensation)? (2 Marks)

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Q.2.

(Total 4 Marks)

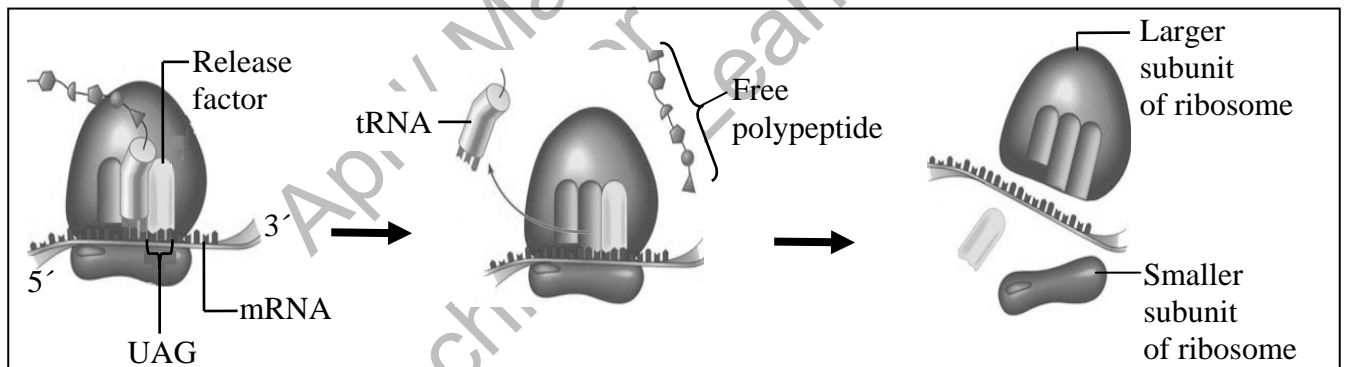
Complete the table by mentioning the location of the development of an embryo and its source of nourishment in each type of animals.

Type of Animals	Location of Development	Source of Nourishment
Oviparous Animals		
Viviparous Animals		

Q.3.

(Total 4 Marks)

The given diagram represents one of the steps of protein synthesis.



- a. Identify the step of protein synthesis shown in the given diagram. (1 Mark)

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- b. What type of codon does UAG represent? (1 Mark)

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c. Describe the role of release factor.

(2 Marks)

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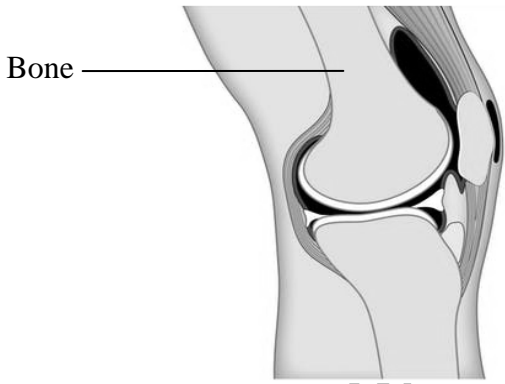
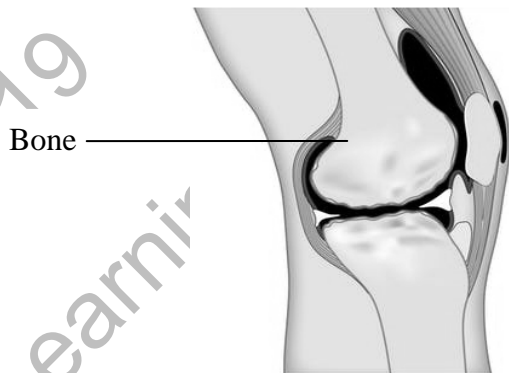
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Q.4. (Total 5 Marks)

a.

Normal Condition of Joint	Diseased Condition of Joint
 <p>Bone</p> <p>Diagram I</p>	 <p>Bone</p> <p>Diagram II</p>

i. Which part of the human skeleton contains the joint shown in diagram I?

(1 Mark)

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ii. With reference to diagram II, name the

(2 Marks)

- diseased condition of the joint.

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- part of the joint that degenerates to cause this condition.

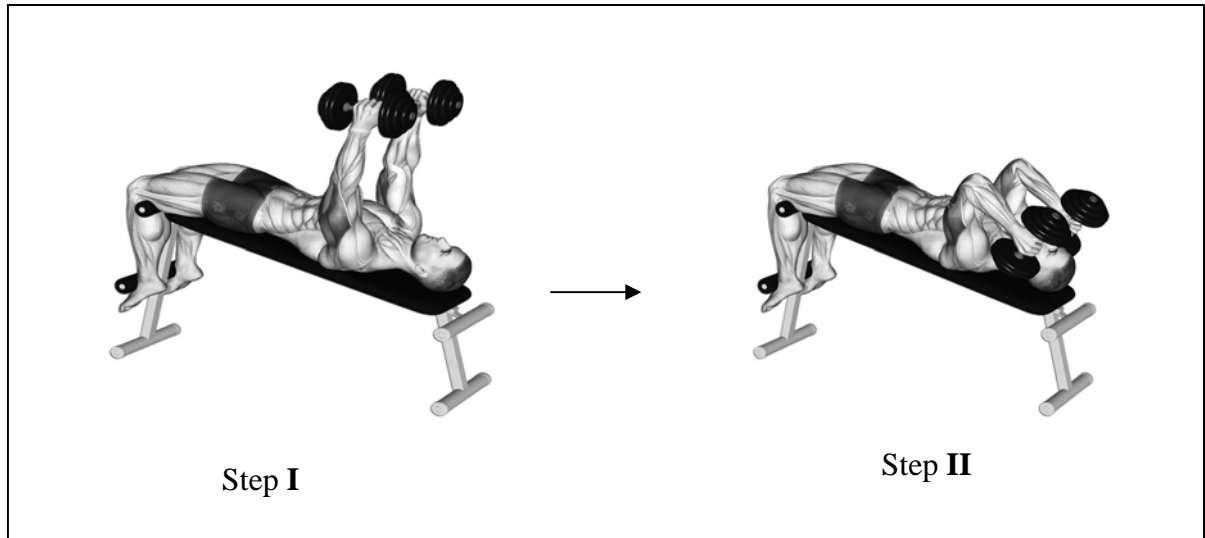
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b. The given diagram represents a type of exercise.

(2 Marks)



Describe the movement of upper arm muscles from step I to II of the given exercise.

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Q.5. (Total 5 Marks)

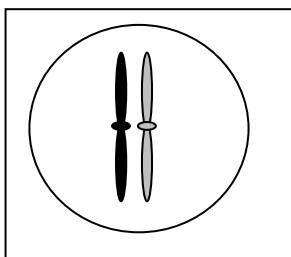
a. What is the role of meristem in plants? (1 Mark)

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b. The given diagram shows a cell with two chromosomes.



Illustrate the condition of chromosomes in the given stages of mitosis and meiosis. (4 Marks)

Stage of Mitosis		Stage of Meiosis	
Metaphase	Anaphase	Metaphase I	Anaphase II

Q.6.

(Total 5 Marks)

- a. Mr Ali is heterozygous for free earlobes and dark hair colour. Genotypically this can be represented as EeDd.

Mention all the possible gametes that he can produce?

(1 Mark)

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- b. Why does the combination of alleles  $I^A$  and  $I^B$  result in the production of blood group AB?

(1 Mark)

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c.

- i. Name the most efficient method that produces large number of copies of DNA fragments in limited time period.

(1 Mark)

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- ii. Mention the TWO important tools (molecules) that are used in this method.

(2 Marks)

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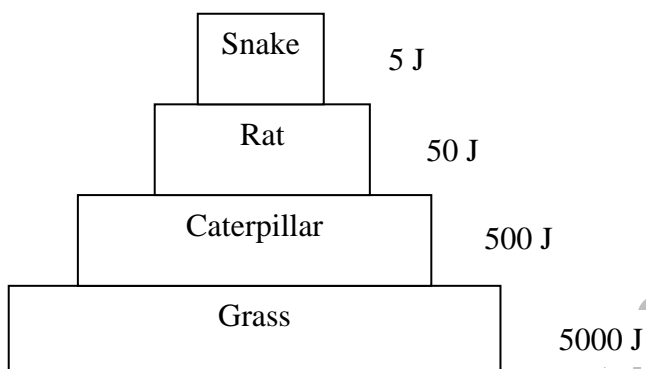
Q.7. (Total 5 Marks)

a. Name any TWO edaphic factors of biomes. (1 Mark)

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b. The given diagram illustrates a pyramid of energy.



Mention any THREE biological means through which energy is lost from the given pyramid. (3 Marks)

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c. Why are trees called environmental buffers? (1 Mark)

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Q.8.

(Total 4 Marks)

- a. Mention any TWO objections that were made on Darwin's theory of evolution. (2 Marks)

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- b. Describe the evolutionary relationship of gills in fish and eustachian tube in human beings. (2 Marks)

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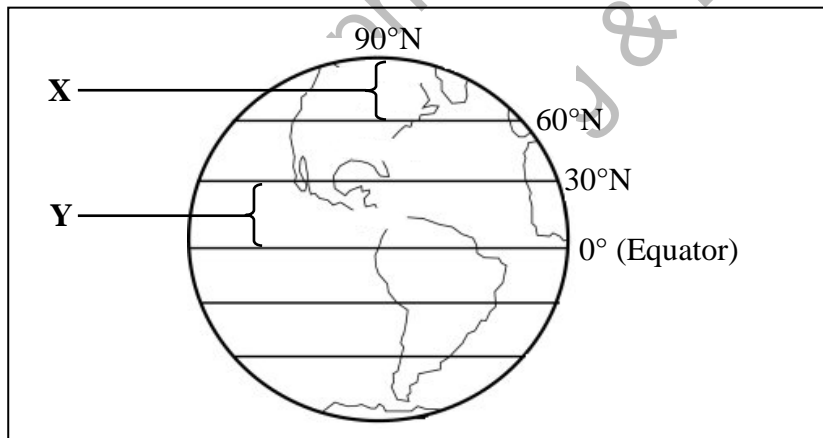


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Q.9.

(Total 4 Marks)

The given diagram represents distribution of biomes in the North latitude.



Complete the table using the given diagram.

Type of Terrestrial Ecosystem		
	X	Y (Forest Ecosystem)
Name of the Ecosystem		
Climatic Condition		

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## EITHER

- OR**

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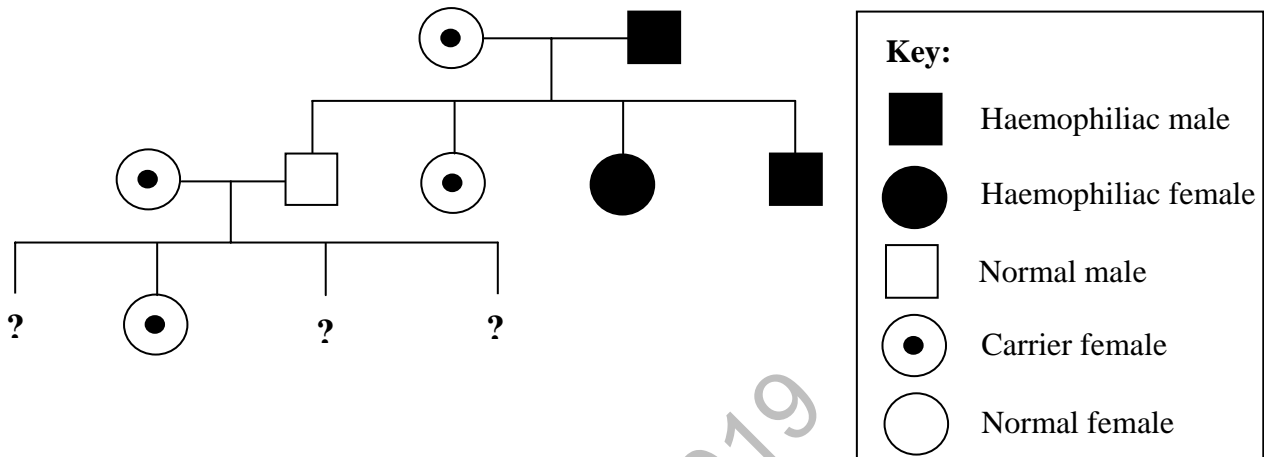
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Q.11.

(Total 8 Marks)

**EITHER**

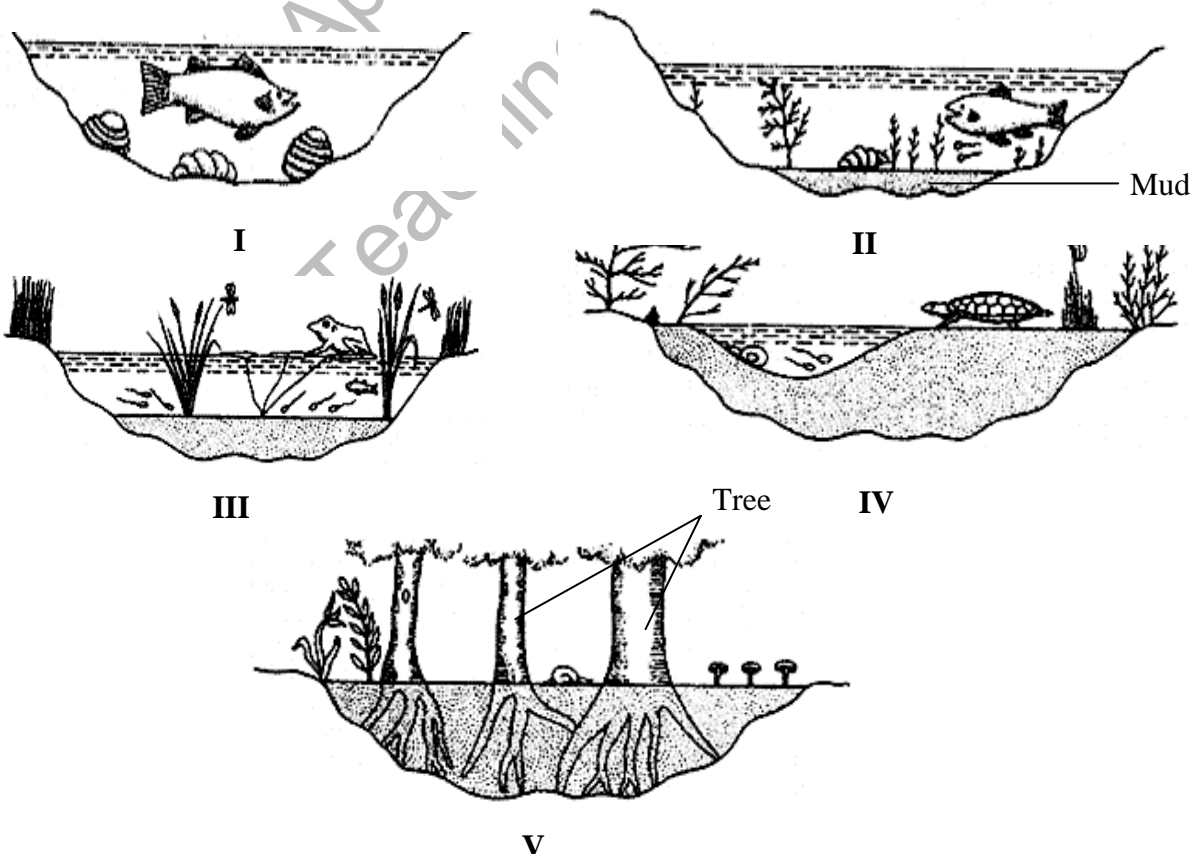
- a. The given pedigree shows the inheritance of haemophilia.



- i. Identify the phenotypes of the unknown offspring in the given pedigree. (3 Marks)
- ii. Describe the pattern of inheritance of haemophilia in male and female individuals referring to the given pedigree. (5 Marks)

**OR**

- b. The given diagrams show different stages, I to V, involved in the hydrarch succession.



- i. Name the group of species which forms the pioneer community in hydrach succession. (1 Mark)
- ii. Identify the diagram that represents the climax stage. (1 Mark)
- iii. Describe the features of the given stages, **II**, **III** and **IV**. (6 Marks)

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