

AGA KHAN UNIVERSITY EXAMINATION BOARD

HIGHER SECONDARY SCHOOL CERTIFICATE

CLASS XII

MODEL EXAMINATION PAPER 2020

Biology Paper II

Time: 2 hours 10 minutes Marks: 50

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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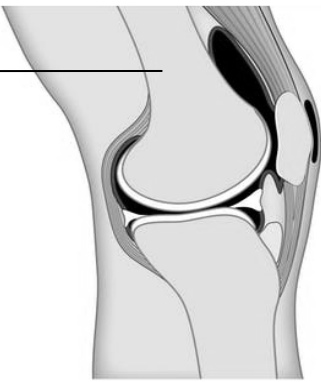
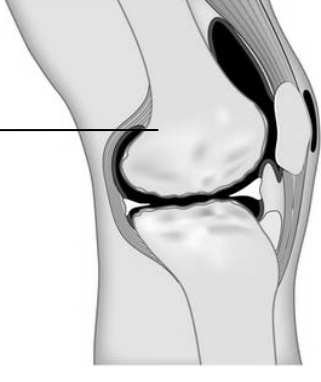
2. There are TWELVE questions. Answer ALL questions. Questions 11 and 12 offer TWO choices. Attempt any ONE choice from each.
3. When answering the questions:

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 3 Marks)

Identify any TWO thermoregulatory adaptations in plants at low temperatures. Describe any ONE of the identified adaptations.

Q.2. (Total 3 Marks)

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

a. Which part of the human skeleton contains the joint shown in diagram I? (1 Mark)

b. With reference to diagram **II**, name the

- diseased condition of the joint. (1 Mark)

- part of the joint that degenerates to cause this condition. (1 Mark)

Q.3. (Total 4 Marks)

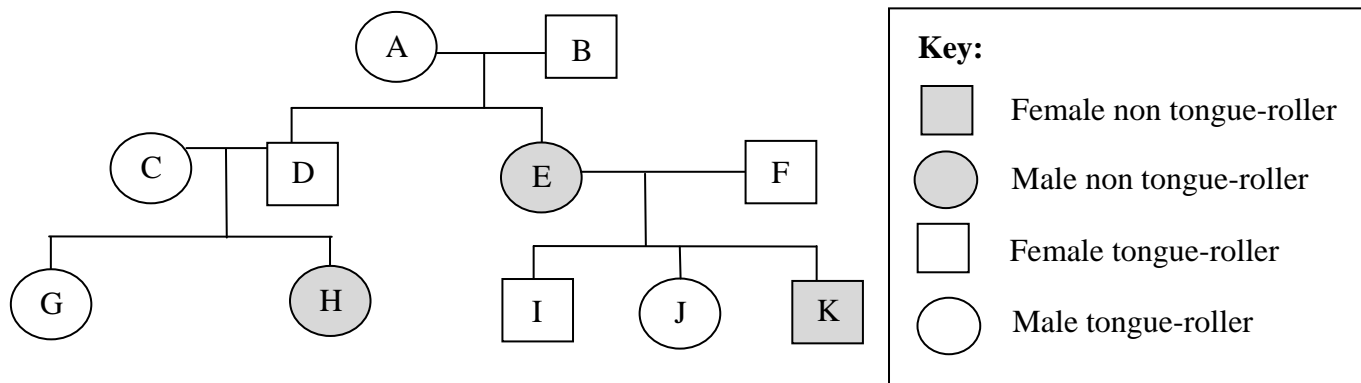
- a. Procaine is used to cause insensitivity to pain during dental surgeries. This drug acts by blocking the opening of voltage gated sodium channels in the neurons.

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

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- b. Tongue-rolling is an inherited characteristic controlled by different forms of a gene. T (roller) represents the dominant form of the gene, and t (non-roller) represents the recessive form.

The family tree diagram shows a pattern of inheritance of the characteristic.



Show the gametes of E and F and expected genotypes of their offspring by using Punnet square.

(2 Marks)

Space for Punnet Square

Q.4.

(Total 4 Marks)

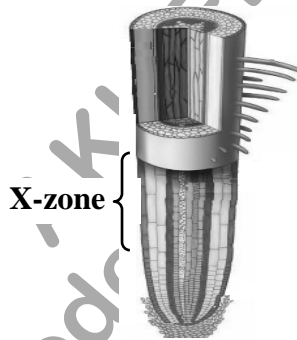
Complete the table by mentioning the location of the development of an embryo and its source of nourishment in each type of animals.

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

Q.5.

(Total 4 Marks)

The given diagram depicts the structure of a generalised root tip of a plant.



a. Name the **X-zone** shown in the diagram.

(1 Mark)

b. Mention any **THREE** changes that occur in the cells of **X-zone**.

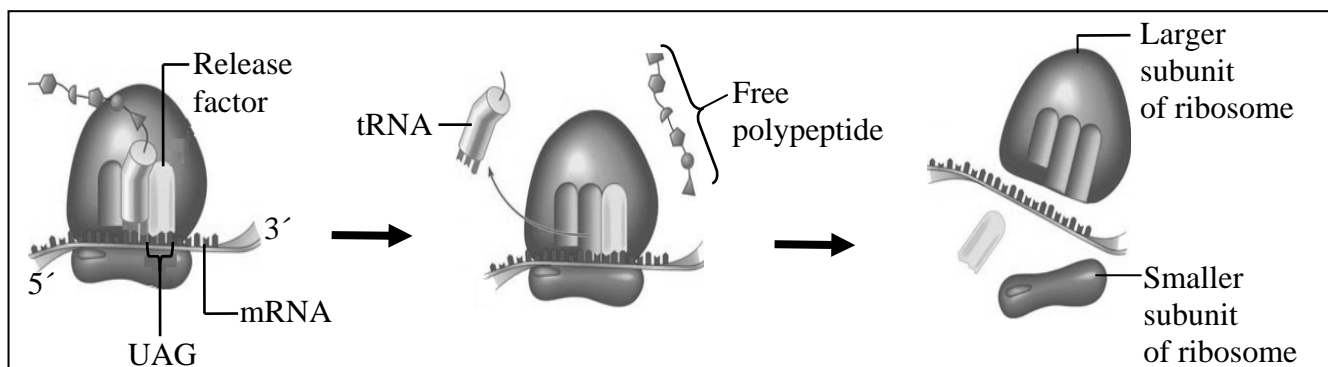
(3 Marks)

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Q.6.

(Total 3 Marks)

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



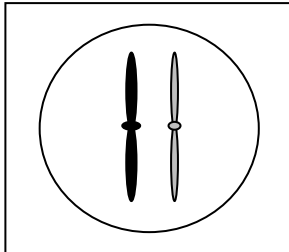
- a. Identify the step of protein synthesis shown in the given diagram. (1 Mark)

- b. Describe the role of release factor. (2 Marks)

Q.7.

(Total 4 Marks)

The given diagram shows a cell with two chromosomes.



Illustrate the condition of chromosomes in the given stages of mitosis and meiosis.

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

Q.8.

(Total 3 Marks)

- a. Name the most efficient method that produces large number of copies of DNA fragments in limited time period. (1 Mark)

- b. Mention the TWO important tools (molecules) that are used in this method. (2 Marks)

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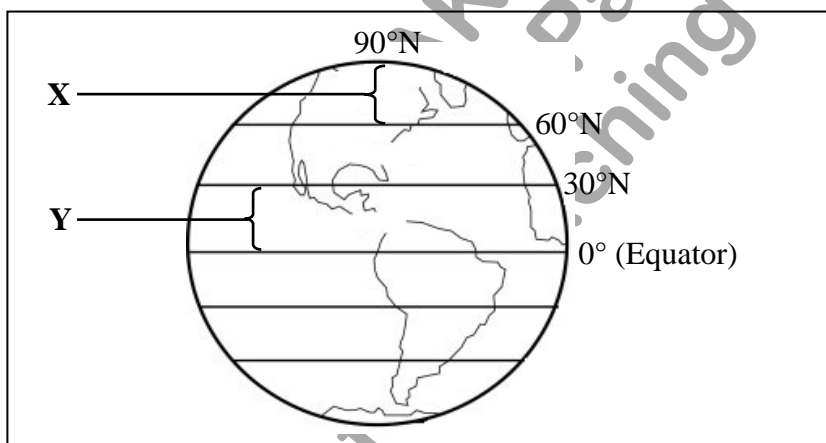
Q.9. (Total 2 Marks)

Describe the evolutionary relationship of gills in fish and eustachian tube in human beings.

Q.10. (Total 5 Marks)

a. Write any TWO characteristic features of the foliage lichen stage of xerarch. (2 Marks)

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



Complete the table using the given diagram. (2 Marks)

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

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

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Q.12.

(Total 8 Marks)

EITHER

a.

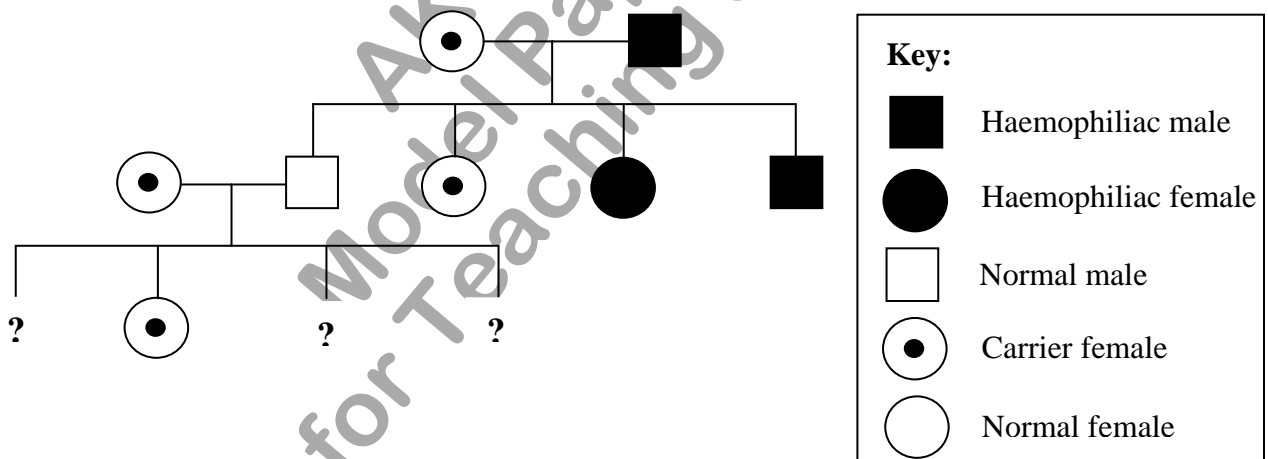
- i. State any TWO advantages of learned behaviour for animals. (2 Marks)
- ii. Identify the type of learned behaviour for each description mentioned in the given table. (2 Marks)

S. No.	Description	Type of Learned Behaviour
I	Pairing of an irrelevant stimulus with a natural primary stimulus	
II	Association of a stimulus with a reward	

- iii. Elaborate each description (from part ii) with the help of an example or an experiment. (4 Marks)

OR

- b. 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)

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