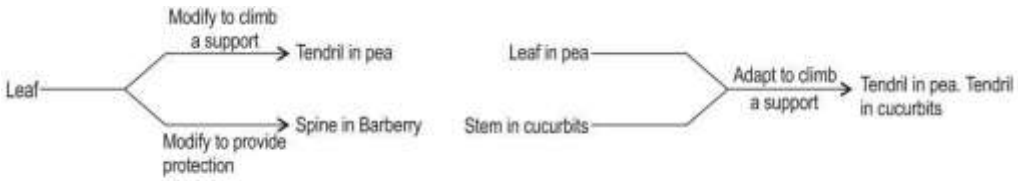
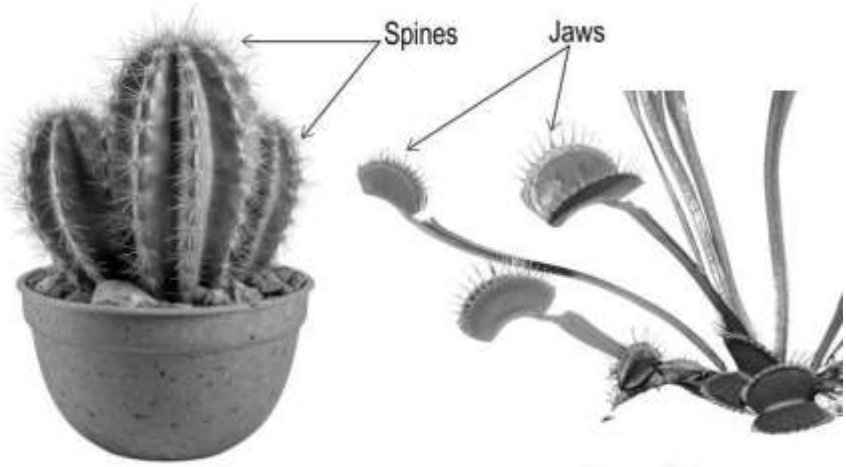
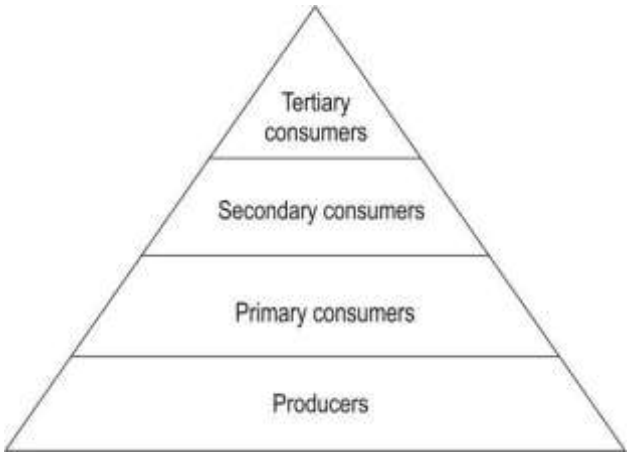
16. WORLD OF LIVING

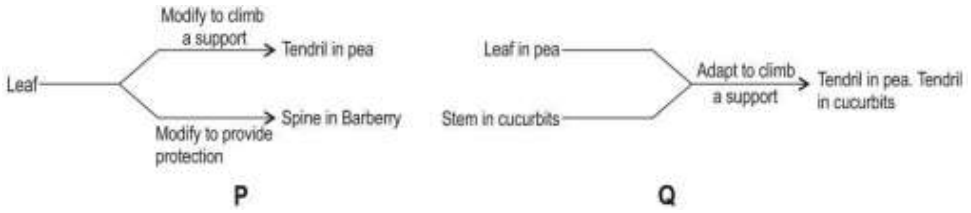
Q.No	Question	Marks
	Multiple Choice Question	
Q.73	Study the diagrams given below that depict the analogy/homology of organs and answer the question that follow.  P Q In cactus, leaves are modified into spines. In Venus flytrap, leaves are modified into jaws.  Cactus Venus flytrap Which diagram are the spines in the cactus and the jaws in the venus flytrap an example of? A. Only P B. Only Q C. Both - P and Q D. Neither - P nor Q	1
Q.74	Which of the following would be true about the wings of a bat and wings of a bird? A. They are analogous organs with same functions. B. They are analogous organs with different function. C. They are homologous organs with same function.	1

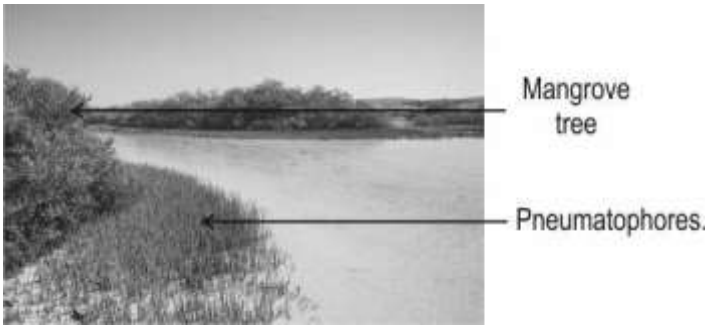
	D. They are homologous organs with different functions.	
Q.75	Two statements are given - one labelled Assertion (A) and the other labelled Reason (R). Read the statements carefully and choose the option that correctly describes statements A and R. Assertion (A): Desert plants take in carbon dioxide for photosynthesis during the night. Reason (R): In desert plants, the stomata are closed during the day to conserve water by reducing transpiration. A. Both A and R are true and R is the correct explanation of A. B. Both A and R are true but R is not the correct explanation of A. C. A is true but R is false. D. A is false but R is true	1
Q.76	Given below are some biotic and abiotic components of an ecosystem. rock, rainfall, sunlight, mango tree, rabbit Which of these components can continue to exist in the absence of the other component/s? A. Only sunlight B. Only rock and sunlight C. Only mango tree and rabbit D. Only rock, sunlight and rainfall	1
Q.77	Shown below are the trophic levels of an ecosystem.  In which of the levels can an omnivore be present? A. Only secondary consumers B. Only secondary and tertiary consumers C. Only primary and secondary consumers	1

	D. Only primary, secondary and tertiary consumers	
Q.78	If the total energy at the trophic level of producers in an ecosystem is 'E', then which of the following corresponds to the energy available to the tertiary consumers? A. E/10 B. 10 x E C. E/1000 D. 1000 x E	1
Q.79	Two statements are given - one labelled Assertion (A) and the other labelled Reason (R). Assertion (A): Plants that can reproduce asexually cannot reproduce sexually. Reason (R): Asexual reproduction does not involve the production of gametes. Which of the following correctly describes statements A and R? A. (A) and (R) are true and (R) is the reason for (A). B. (A) and (R) are true, but (R) is not the reason for (A). C. (A) is false, but (R) is true D. (A) is true, but (R) is false.	1
Q.80	Biological magnification is the increase in concentration of certain substances in the tissues of organisms at successively higher levels in a food chain. Which of the following could the increase be a result of? P) Inability of environmental processes to break down the substance. Q) High rate of excretion of the substance by the organism. R) Low rate of internal degradation of the substance by organisms. A. Only P B. Only P and R C. Only Q and R D. All - P, Q and R	1
Q.81	Two statements are given below - one labelled Assertion (A) and the other labelled Reason (R). Assertion (A): Blood cells do not receive or pass information to the rest of the human body. Reason (R): Blood cells are not directly connected with neurons.	1

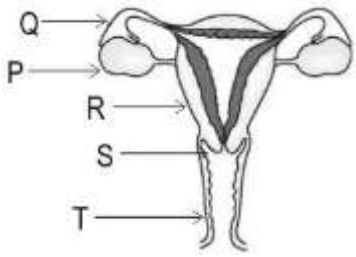
	Which of the following is CORRECT? A. Both A and R are true, and R is the correct explanation for A. B. Both A and R are true, but R is not the correct explanation for A. C. A is true, but R is false. D. A is false, but R is true.	
Q.82	If a tall pea plant bearing red flowers (TTRr) is crossed with another pea plant that is short and has white flowers (ttrr), what percentage of GAMETES will have both alleles for short and white flowers? A. 0% B. 25% C. 50% D. 75%	1
	Rett syndrome is a condition caused due to the mutation of a gene located on the X chromosome such that if an individual carries even a check of the mutated gene they show symptoms of the condition. Consider two cases: Case I: The father is affected (X^RY) but the mother is not (XX). Case II: The father is not affected (XY) but the mother is (X^RX). Answer Q.83 and Q.84 based on the facts given above.	
Q.83	What is the probability of the sons showing symptoms of the disease in Case I? A. 0% B. 50% C. 75% D. 100%	1
Q.84	What percentage of daughters will be affected in Case II? A. 0% B. 25% C. 50% D. 100%	1
Q.85	A person views an object placed at a certain distance from him. Under which of the following scenarios will the ciliary muscles contract to make the eye lens thicker? A. Amount of light falling on the object is increased B. Amount of light falling on the object is decreased C. Object is moved closer to the eye	1

	D. Object is moved away from the eye	
Q.86	Which of the following is/are TRUE about traits that have NOT been naturally selected? X) They were always detrimental to the life of the organism. Y) Their frequency reduces in subsequent generations. Z) Organisms carrying these traits cannot reproduce at all. A. Only X B. Only Y C. Only Y and Z D. Only X and Z	1
Q.87	Gautam notices that Geeta wears spectacles that contain concave lens. Which of the following conditions could she be suffering from? A. Myopia B. Hypermetropia C. Presbyopia D. Night blindness	1
Q.88	In their natural habitats, and in normal conditions, in which of the following organisms does the offspring exhibit genetic differences from their parents? A. Cyanobacteria B. Amoeba C. Planaria D. Ant	1
Q.89	Two statements are given below - one labelled Assertion (A) and the other labelled Reason (R). Assertion (A): An organism with 24 chromosomes undergoes binary fission to give rise to daughter cells with 12 chromosomes each. Reason (R): Binary fission gives rise to two identical daughter cells. Which of the following is correct? A. Both A and R are true, and R is the correct explanation for A. B. Both A and R are true, but R is not the correct explanation for A. C. A is true, but R is false D. A is false, but R is true.	1
Q.90	Which of the following actions helps the eye in focusing on distant objects?	1

	A. Pupil dilation B. Thickening of the eye lens C. Relaxation of the ciliary muscles D. Contraction of the ciliary muscles	
Q.91	A certain class of herbicides does not allow pollen tube formation. Which of the following processes does it inhibit? A. Cross-pollination B. Self-pollination C. Seed dispersal D. Fertilisation	1
	Study the diagrams given below that depict the analogy/homology of organs and answer the question that follow.  	
Q.92	Sweet potato is a root that stores food. Potato is a stem that stores food. Which diagram(s) is/are the example/s above related to? A. Only P B. Only Q C. Both - P and Q D. Neither - P nor Q	1
Q.93	Here is an image of a pea plant climber. The tendrils at the tip of the plant tend to circle around an object or a surface.  When are tendrils likely to grow rapidly?	1

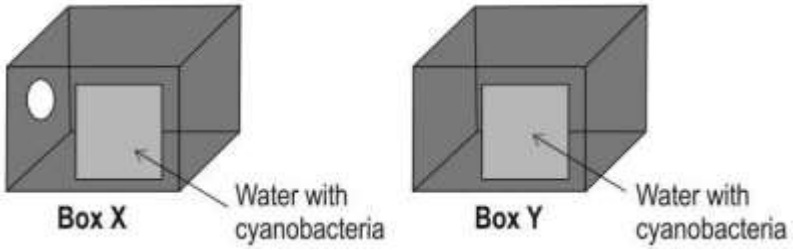
	A. When the plant is kept warm B. When the plant is well watered C. When the tendril is exposed to light D. When the tendril is in contact with a surface	
Q.94	Pneumatophores are a special type of root found in mangrove trees. They help the trees by absorbing oxygen needed for the process of respiration in the roots.  Choose the statement/s that is/are TRUE about the movement exhibited by pneumatophores. P) They show negative geotropism as they grow against gravity. Q) They show positive phototropism to absorb sunlight. R) They show positive geotropism as the roots grow below the ground. A. Only P B. Only Q C. Both P & Q D. Both Q & R	1
Q.95	Identify the example that BEST describes a response to a stimulus. A. Absorption of sunlight by chloroplast B. Germination of pollen grains on the stigma C. Absorption of nutrients from the soil through root hairs D. Transportation of water and nutrients through the xylem	1
Q.96	Person X met with an accident and injured a part of the hindbrain. Identify the function that is most likely to be affected due to the injury. A. Display of emotions B. Walking in a straight line C. Regulation of blood pressure D. Maintenance of body temperature	1

Q.97	A plant 'X' is placed in a closed box and is left unwatered for 15 days. Identify the plant hormone that is MOST LIKELY to be released and the reason for it. A. Auxins are released in response to the absence of light. B. Cytokinins are released to enhance the growth of the shoot. C. Abscisic acid is released in response to the scarcity of water. D. Gibberellins are produced in response to the absence of water.	1
Free response question/Subjective Question		
Q.98	There are different nutrients required by the human body. These are in 3 major categories of carbohydrates, fats and proteins (apart from vitamins, minerals and roughage). (a) Digestion of nutrient R happens in the stomach. Identify R. (b) Consider fats and oils from your diet as large globules in your digestive tract. Name the reaction that can help in making these easier to absorb. (c) What is the difference in the kind of medium required for digestive enzymes in the stomach and the small intestine to work?	3
Q.99	In a population of 10,000 ladybugs spread over the entire country, there are 7500 red-colored with black spots, 1200 purple-colored with black spots, and remaining are white-colored with black spots. Which colored ladybugs have an evolutionary advantage? Why?	2
	Bindu wants to produce a hybrid variety of tomatoes. She has tomato plants X and Y belonging to two different varieties, one with smooth, long fruits and the other one with wrinkled, round fruits. Tomatoes have bisexual flowers. Bindu carries out the following steps carefully to cross pollinate the flowers of plants X and Y: 1. She removes a part of the flowers of tomato plant X just before the flowers bloom. 2. She manually pollinates the flowers of tomato plant X using pollen from the flowers of tomato plant Y. 3. She ties small plastic bags around the pollinated flowers of tomato plant X. The plastic bags are removed after a couple of days.	
Q.100	Bindu now wants to try producing a hybrid variety of pumpkins from two varieties P and Q. Pumpkin plants have unisexual flowers, with both male and female flowers on all plants. There is a slight variation in the procedure as described below: - She does NOT remove any part from the pumpkin flowers she wants to pollinate.	2

	- However, she still ties small plastic bags around the manually pollinated flowers. Explain why Bindu does not remove any part from the flowers to be pollinated, but still ties small plastic bags after pollination.	
Q.101	Read the two statements below. (P) Adrenaline is also called the fight or flight hormone. (Q) Adrenaline affects the heart to increase heart rate for optimum delivery of oxygen to muscles. Does statement (Q) offer a valid explanation for statement (P)? Justify your answer.	1
Q.102	Human systems work in coordination with each other. Pratik spent an hour in the swimming pool and found himself breathing heavily. (a) Name the: (i) system/s that help his body regain normalcy (ii) system/s that help the systems mentioned in (a-i) to function (b) What can happen to the composition of Pratik's blood if the system/s mentioned in (a-i) does/do not respond properly?	2
Q.103	Vasectomy is a method of contraception in males where the vasa deferentia are tied or sealed so as to prevent sperm from entering the urethra. The diagram below represents the human female reproductive system with some of its parts marked P, Q, R, S, T.  (a) Identify the labelled part that will be operated on for 'tubectomy' in females. State its function. (b) Kavya says that if part R is removed the female would not be able to produce eggs. Is she correct? Justify.	3
Q.104	A new sugarcane plant is genetically the same as the parent plant, but a child of human parents is genetically not the same as its parents. Explain why.	2
Q.105	Cyanobacteria, also known as blue-green algae, are a group of photosynthetic bacteria that can fix atmospheric nitrogen and thrive in diverse habitats. They	3

<table>
<tr><td></td><td>have the ability to produce large amounts of biomass and accumulate lipids suitable for biofuel production.

Shown below are two boxes, X and Y. Containers with water that contains cyanobacteria are placed in both boxes.

(a) Ideally, how should the samples of water with cyanobacteria be kept in order to get products that can be used for maximum production of biofuels?

(b) In which of the boxes, is cyanobacteria likely to have better growth and why?</td><td></td></tr>
<tr><td>Q.106</td><td>Hormones in Animals are secreted in specific quantities by glands in the body. The secretion of these hormones is also regulated by the body.

(a) The table below gives the normal reading of blood glucose levels before and after eating.

<table><tr><th>Before eating</th><th>After eating</th></tr><tr><td>80-100</td><td>170-200</td></tr></table>
Ram's blood glucose level is 275. Name the hormone that would be released to regulate the blood glucose level.

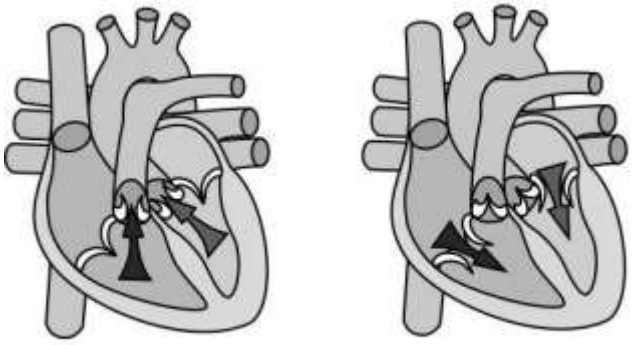
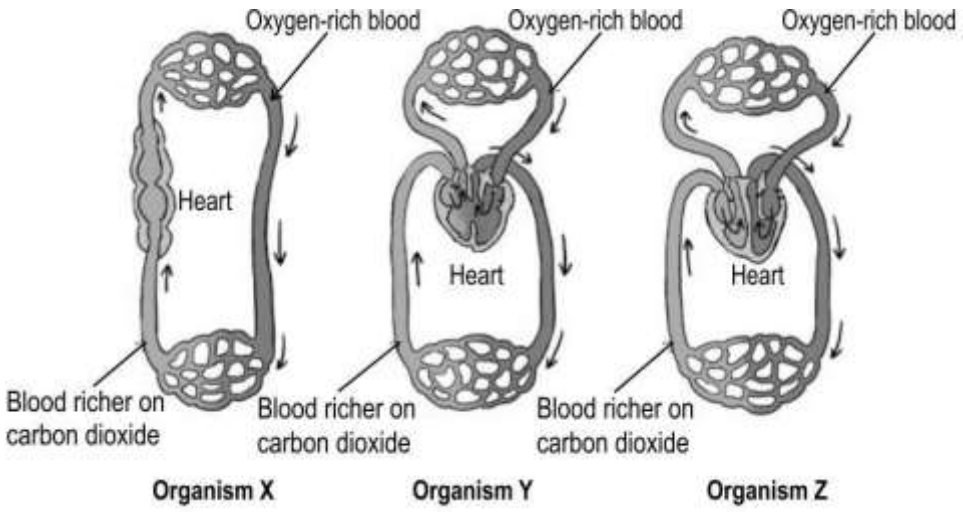
(b) Explain the regulation of the hormone named in answer (a) in TWO points.</td><td>3</td></tr>
<tr><td>Q.107</td><td>The stimulus of touch triggers different responses in different plants.

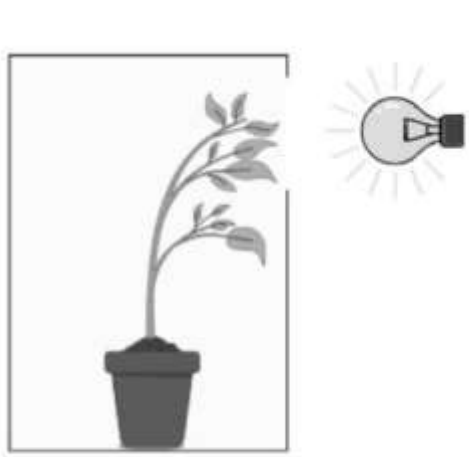
A blue pea plant is kept in a well-lit area. The shoot tip curls around the support while growing.

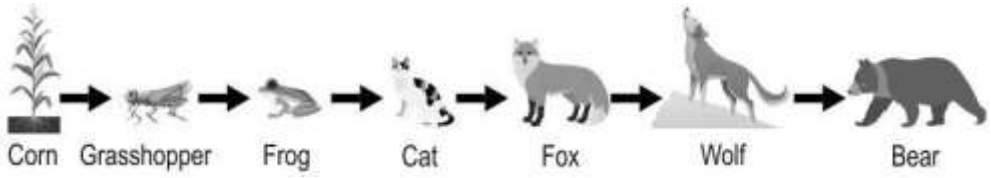
 

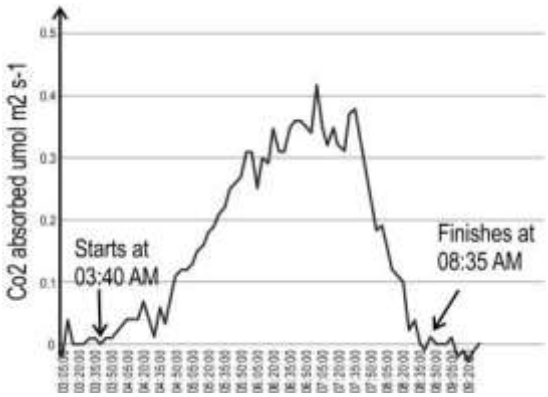
(a) The curling of the shoot tip is in response to touch, not sunlight. Describe an experiment to prove this statement.</td><td>4</td></tr>
</table>

	(b) Explain the steps by which the Venus flytrap plant traps insects.	
Q.108	Nitu and Ria went for a routine health check. The doctor tapped the patellar tendon that is below the kneecap. Nitu showed a knee-jerk reaction but Ria didn't show any reaction. (a) What does the lack of reaction in Ria indicate? (b) If Ria sees a sharp object and does not step on it, what kind of action is it? Describe the neural path followed for this action. (C) Write TWO points explaining the neural pathway followed for the knee-jerk reaction in Nitu.	4
Q.109	Here is a conversation between Ria and Lipa: Ria: The sky appears blue as the blue light scatters the most. Lipa: The sky is blue because it reflects the blue of the seas and oceans. Who is correct? Justify your answer.	2
Q.110	Roopa conducts an experiment with light. She notices that when light rays fall on the surface of a certain object, the light rays change direction. When the light leaves the object from another surface, the light rays bend again. (a) What could be the object that Roopa used to conduct this experiment? (b) Why does the light bend twice? Explain with two points.	3
Q.111	Tina was star gazing. She observed celestial objects P and Q. They were visible brightly in the night sky. She concluded that one was a star and the other was a planet. (a) What could she have observed to arrive at her conclusion? (b) If these celestial objects P and Q were to be observed from the moon, would Tina be able to distinguish them as a star and a planet? Why or Why not?	3
Q.112	Nia looked at an object X that was kept near her. She could see it clearly. She then looked at object Y which was kept farther away. She could see object Y also clearly. (a) Which part of the eye enables a person to see clearly, both, objects that are near and those that are far away? Why? (b) Describe the eye changes that enable nearby objects to be seen clearly. (c) Describe the eye changes that enable far-away objects to be seen clearly.	3
Q.113	The figures P and Q show the state of the heart at stages of the cardiac cycle.	2

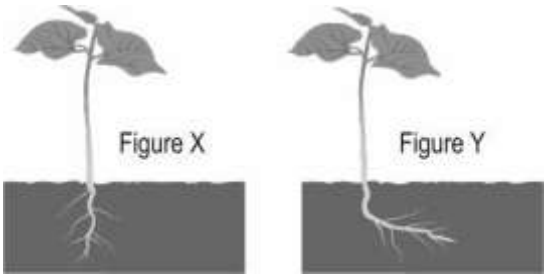
	 Figure P Figure Q Identify the blood pressure values that will be obtained at the stages of the heart, shown in figures P and Q, for a normal person at rest.	
Q.114	In the digestive tract, food is moved forward by the rhythmic contraction of muscles lining the tract. This process is called peristalsis. List ALL the parts of the digestive tract in which peristalsis occurs.	3
Q.115	In most adults, the left atrium is separated from the right atrium by a septum (wall) to prevent the oxygen-rich blood in the left atrium from mixing with the blood containing a higher amount of carbon dioxide in the right atrium. The patent foramen ovale (PFO) is a hole in the septum separating the left and right atria (upper chambers) of the heart. This hole exists in everyone before birth, but most often closes shortly after a baby is born. Explain why the hole in the septum separating the atria does not cause problems in a baby before it is born.	1
Q.116	Shown below are the diagrammatic representations of the circulatory systems of three organisms X, Y and Z.  (a) Identify which organism is a fish. Give a reason for your answer. (b) Identify the organism(s) that does/do NOT require energy to maintain their body temperature.	3

Q.117	The two pictures below illustrate tropism in plants. P shows a plant bending towards light. Q shows a plant twining around a pole.  P. Plant bending towards light  Q. Plant twining around a pole Based on the pictures, what is true about the growth rate of the plant cells on the side away from the stimulus as compared to the growth rate of the plant cells on the side towards the stimulus?	1
Q.118	The picture below shows a cow looking for food in the garbage.  Very often, while eating some food the animal also swallows plastic. The plastic that the animal swallows remains undigested and accumulates in the stomach. This eventually leads to starvation as there is less and less space for real food. Give one reason for plastic remaining undigested in an cow's stomach.	1
Q.119	In the food chain given below, which position would a vulture occupy? Justify your answer. Plants -------> Rabbit --------> wild cat ---------> lion	2
Q.120	Observe the food chain shown below.	2

	 Is such a food chain likely to exist in nature? Justify your answer.	
Q.121	'Plants and animals give out carbon dioxide all the time.' Is this statement true or false? Justify your answer.	2
Q.122	State what is required for two or more food chains to form a food web.	1
Q.123	Raman's mother moved her leg immediately as she saw that she was about to step on Raman's toy. Netra says this action is a reflex action as it was a quick action whereas Kabir says it was a reflex action because it was an involuntary response. Is either of them CORRECT? Justify your answer.	2
Q.124	A scientist wanted to determine whether a tall pea plant X was TT or Tt. To do this he crossed two X plants: (i) one with a pea plant known to carry the TT traits (ii) one with a pea plant known to carry the tt traits (a) Considering that X could be TT or Tt, what ratios would he obtain in both crosses - (i) and (ii)? Show the crosses. (b) Based on the ratios obtained in (a), a cross with which parent - (i) or (ii) - would help in identifying whether X was TT or Tt? Justify.	5
Q.125	Genetic drift can greatly increase variation in a population. Is this statement TRUE? Justify.	2
Q.126	Give ONE reason why genetic drift is not the same as natural selection.	1
Q.127	Before Darwin's theory of evolution, another theory existed that postulated that any physical changes that occurred in an organism through its lifetime could be transmitted to its offspring. Using one example, explain why this theory cannot be true.	2
Q.128	One parent suffered from a disease which was then seen only in the male children of subsequent generations and not seen in the female children. Is this disorder likely to be linked to the sex chromosome of the individuals or not? Justify your answer.	1
Q.129	Justify the following statements: (a) Organisms that originate from a common ancestor may look very different from each other.	2

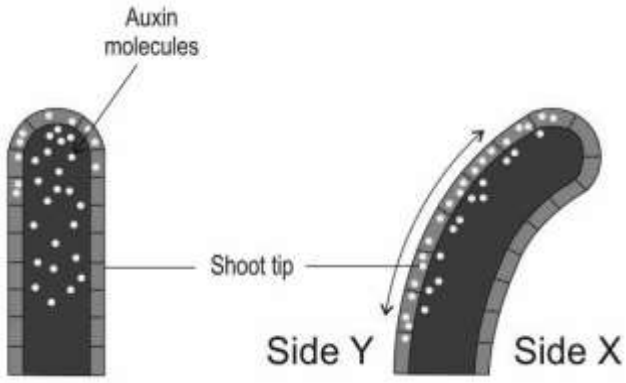
	(b) Organisms that have similar-looking structures may not necessarily come from a common ancestor.	
Q.130	(a) Ketaki thinks that the fresh dialysing fluid that enters the dialysis machine is rich in urea. Is she correct? Why or why not? (b) Urination is a_____(voluntary/involuntary/both voluntary and involuntary) process.	2
Q.131	In diabetic patients, with high blood glucose levels, the urine sample also consists of high levels of glucose. This is mainly because, in the nephron, glucose is not reabsorbed back into the blood. Explain why does reabsorption not take place in two points.	2
Q.132	In respiration, glucose is broken down into a 3-C molecule called pyruvate, in the cytoplasm of the cell. Is this particular process aerobic or anaerobic in nature? Justify your answer.	1
Q.133	The graph below shows the hours of the day during which a plant absorbs CO_2.  (a) In what kind of weather conditions is this plant likely to be growing? Give a reason to support your answer. (b) When is photosynthesis likely to happen in such plants?	2
Q.134	Walnut plants belong to a category of plants where the male and female flowers grow separately on the same plant. A scientist took three plants - P, Q and R. He removed the male flowers from plant P and the female flowers from plant Q. Plant R, he left as it is - with both flowers on the same plant. He kept all three plants in an open space. Will any of these plant/s bear fruits? Justify your answer.	2
Q.135	Consider a woman suffering from a disease that is not linked to the sex chromosome. A geneticist wanted to know the likelihood of this disease passing on to future generations. To identify this, it was important to identify if the disease is caused by a dominant allele or a recessive one. The geneticist made a chart of the appearance of this disease in the family members related to the woman.	2

	State TWO observations in the family history that will help the geneticist identify that the disease is caused by a dominant trait.	
Q.136	A terrarium contains soil and a variety of plants inside a glass container. It is watered and sealed. The soil gives the required nutrients, and plants use the carbon dioxide present in the air inside the container to prepare food using sunlight.  (a) Can this terrarium be called an ecosystem? Give a reason. (b) List the biotic and abiotic components of this ecosystem.	3
Q.137	Neuronal coordination of the body is generally much faster than chemical coordination of the body. Mark the above statement as true or false and justify your answer.	2
Q.138	Here is a picture of a germinating seed.  (a) What is the environmental stimulus required for the seed to develop roots downwards and shoots upwards? Name the respective phenomenon. (b) What environmental factor in the experimental setup shown below can be altered in Figure X to observe the direction of root growth as observed in Figure Y?	3

<table>
<tr><td></td><td> 

(c) Name the tropic movement that occurs when pollen tubes grow towards ovules.</td><td></td></tr>
<tr><td>Q.139</td><td>(a) What is the role of auxin in a plant?

(b) What should be the direction of light for the shoot tip to bend toward a side as given in the image below?

(c) Describe the mechanism involved in the bending of a shoot tip due to stimulation by light.</td><td>3</td></tr>
<tr><td>Q.140</td><td>The thyroid hormone controls the body's metabolism. The two main hormones thyroid releases are thyroxine (T4) and triiodothyronine (T3), which collectively comprise the thyroid hormone. The thyroid-stimulating hormone (TSH) in the pituitary gland stimulates the thyroid to release the hormones.

Ram lives in a remote part of a Himalayan village. He visited the doctor with symptoms of tightness in the throat and a hoarse voice. The doctor asked for a thyroid profile and blood sugar test.

Given below are the test results:

<table>
<tr><th>Test</th><th>Normal/Reference range</th><th>Amount in sample</th></tr>
<tr><td>TSH</td><td>0.4-5 mIU/L</td><td>6 mIU/L</td></tr>
<tr><td>T3</td><td>4.6-12 µg/dL</td><td>1.76 µg/dL</td></tr>
<tr><td>T4</td><td>80-180 ng/dL</td><td>21 ng/dL</td></tr>
<tr><td>Blood sugar (post-meal)</td><td>170-200 mg/dL</td><td>180 mg/dL</td></tr>
</table></td><td>3</td></tr>
</table>

	(a) What could be the deficiency disease Ram maybe suffering from? Justify. (b) State TWO reasons why the doctor prescribed a thyroid test.	
Q.141	Raghav was watching Nia and made the following observation: Nia was practicing boxing. As her opponent swung an arm, Nia blinked her eyes and ducked down. Nia retaliated with a punch. (a) Raghav said that the blinking of eyes and ducking down are both reflex actions. Is he correct? Justify. (b) Explain the nervous process involved in Nia's retaliation with a punch in TWO points.	4
Q.142	Raj is blindfolded. He is made to taste the food without seeing it. He concludes that the food is burnt. (a) What specific component of the tongue helped him conclude the taste of the food? (b) If the food was crunchy, which part of the brain would help him recognise this texture of the food?	2

Answer Key and Marking Scheme

Q. No	Answers	Marks
Q.73	A. Only P	1
Q.74	A. They are analogous organs with same functions.	1
Q.75	A. Both A and R are true and R is the correct explanation of A.	1
Q.76	B. Only rock and sunlight	1
Q.77	D. Only primary, secondary and tertiary consumers	1
Q.78	C. E/1000	1
Q.79	C. (A) is false, but (R) is true	1
Q.80	B. Only P and R	1
Q.81	D. A is false, but R is true.	1
Q.82	C. 50%	1
Q.83	A. 0%	1
Q.84	C. 50%	1
Q.85	C. Object is moved closer to the eye	1
Q.86	B. Only Y	1
Q.87	A. Myopia	1
Q.88	D. Ant	1
Q.89	D. A is false, but R is true.	1
Q.90	C. Relaxation of the ciliary muscles	1
Q.91	D. Fertilisation	1
Q.92	B. Only Q	1
Q.93	D. when the tendril is in contact with a surface	1
Q.94	A. Only P	1
Q.95	B. Germination of pollen grains on the stigma	1

Q.96	B. Walking in a straight line	1
Q.97	C. Abscisic acid is released in response to the scarcity of water.	1
Q.98	(a) protein (b) emulsification (c) Digestive enzymes in the stomach need an acidic medium while those in the small intestine need an alkaline medium.	3
Q.99	1 mark for each: - Red-colored ladybugs have an evolutionary advantage. - This is because they are present in the largest numbers throughout the country.	2
Q.100	1 mark for each reason: - She does not remove any part from the flowers to be pollinated because the female pumpkin flowers don't have any male parts. - She still ties the pollinated flowers because the pollen from other male flowers can still reach the stigma. (Award marks for any other correct justification)	2
Q.101	Yes, it does. [0.5 marks] The effect of adrenaline is to prepare the muscles of the body for a fight or escape response. [0.5 marks]	1
Q.102	(a) 0.5 marks for each correct name: (i) circulatory and respiratory systems (ii) nervous system (b) increased carbon dioxide quantity in blood	2
Q.103	(a) 1 mark for each of the following: Part Q - Fallopian tube Function - Acts as the fertilization place for egg & sperm. (b) 0.5 mark for each of the following: - No, she is not correct	3

	- Eggs are produced in the ovaries which are intact. OR The uterus does not play a role in producing eggs. [Accept any other valid reason.]	
Q.104	- New sugarcane plants are produced by vegetative propagation which is an asexual method of reproduction. Only one parent is involved and there is no mixing of gametes. [1 mark] - Humans reproduce through sexual reproduction involving two parents and the mixing of male and female gametes, which results in the offspring having the genes of both parents. [1 mark]	2
Q.105	(a) 1 mark for each of the following: - Cyanobacteria in box X are likely to have better growth. - Cyanobacteria are photosynthetic bacteria that need sunlight which can enter only in box X as it has an opening. (b) The containers should be kept in the open, where there is maximum exposure to sunlight.	3
Q.106	(a) Insulin would be released in response to the high glucose level. (b) 1 mark for each of the following points: - When the level of glucose increases, the cells of the pancreas release insulin. - When the level of glucose is stabilized, the cells of the pancreas regulate the production of insulin and reduce insulin production through a feedback mechanism.	3
Q.107	(a) Growth needs to be observed in each of the following plants: - Keep a blue pea plant with a stick in the dark and another one with a stick in the sunlight *[1 mark]* - Keep another blue pea plant without a stick in the dark and another one without a stick in the sunlight *[1 mark]* (b) 1 mark for each point: - The venus fly trap plant's leaves have hairs sensitive to touch. - When a fly sits on the leaf, it triggers/stimulates the hairs and in response to this the leaf traps shut.	4

Q.108	(a) Ria's lack of reaction in response to the tapping of the patellar tendon indicates possible damage to the central nervous system or a neurological problem. (b) 1 mark for each of the following: - If Ria sees a sharp object and does not step on it, it is a voluntary action. - The neural path followed is - signal from the eyes is passed to the brain, and from the brain, the message is passed to move away by the motor nerve to the legs/effector organ. (c) 1 mark for each of the following: - Tapping of the patellar tendon initiates the neural signal, which is transmitted through the sensory neuron to the spinal cord. - From the spinal cord, the signal to stretch the leg is passed through the motor neuron to the leg muscle.	4
Q.109	Ria is correct. (1 Mark) -The sky appears blue as blue light has a shorter wavelength than red light. -Scattering is inversely proportional to the wavelength of light. *(Give 1 mark if both points are mentioned)*	2
Q.110	(a) Roopa could have used any transparent object which could be made of glass or plastic. (b) 1 mark for each of the following: - Light goes through two refractions in the object. The first one is the air-glass interface when light is incident on the object. - The second one is the glass-air interface when the ray of light emerges out of the object. This happens because light has travelled from an optically denser medium to an optically rarer medium.	3
Q.111	(a) One of the celestial objects was twinkling, while the other was not. (1 mark) (b) - If the celestial objects were to be observed from the moon, Tina would not be able to distinguish them as a star or a planet. - Since there is no atmosphere on the moon, stars would not appear to twinkle. (1 mark for each point.)	3

Q.112	(a) The lens of the eye, because it has the ability to adjust its focal length. (b) When we are looking at nearby objects closer, the ciliary muscles contract. This increases the curvature of the eye lens. The eye lens then becomes thicker. The focal length of the eye lens decreases. This enables us to see nearby objects clearly. (c)The curvature of the eye lens can be modified to some extent by the ciliary muscles. The change in the curvature of the eye lens changes its focal length. When the muscles are relaxed, the lens becomes thin, and its focal length increases. This enables us to see distant objects clearly.	3
Q.113	1 mark each for the following: - Figure P: 120 - Figure Q: 80	2
Q.114	0.5 marks for each of the following: - pharynx - oesophagus - stomach - small intestine - large intestine - anus	3
Q.115	A baby does not use its lungs when it is growing in the womb. [1 mark] OR The hole in the septum does not cause problems in an unborn infant as the developing embryo gets nutrition and oxygen from the mother's blood through the placenta and umbilical cord. [1 mark]	1
Q.116	(a) organism X [1 mark] 1 mark for any one of the following: - fishes have a two-chambered heart. - In fishes, the blood passes through the heart only once during one cycle (b) 0.5 marks each for the following:	3

<table>
<tr><td></td><td>- organisms X

- organism Y</td><td></td></tr>
<tr><td>Q.117</td><td>The cells on the side away from the stimulus grow faster than the cells on the side of the stimulus.</td><td>1</td></tr>
<tr><td>Q.118</td><td>Cows do not produce the enzyme required to break down and digest plastic material.</td><td>1</td></tr>
<tr><td>Q.119</td><td>A vulture would occupy a position after the lion.

Vultures are scavengers that feed on the remains of dead organisms.</td><td>2</td></tr>
<tr><td>Q.120</td><td>Such a food chain is not likely to exist in nature.

The food chain shown has too many trophic levels. Due to the loss of energy at each level, there will not be enough energy available at the higher trophic levels.</td><td>2</td></tr>
<tr><td>Q.121</td><td>- True. [1 mark]

- Plants and animals respire continuously and hence give out the product of respiration, carbon dioxide, all the time. [1 mark]

(No marks to be awarded without justification.)</td><td>2</td></tr>
<tr><td>Q.122</td><td>They must have an organism that is eaten by two or more other kinds of organisms.

[Accept any other valid answer.]</td><td>1</td></tr>
<tr><td>Q.123</td><td>0.5 marks for each of the following:

- Neither of them is correct.

- The action was a voluntary action in response to seeing the toy.

[Accept any other valid justification.]</td><td>2</td></tr>
<tr><td>Q.124</td><td>(a) 0.5 marks each for the correct crosses and the correct ratios:

(i) If X was TT

<table><tr><th></th><th>T</th><th>T</th></tr><tr><td>T</td><td>TT</td><td>TT</td></tr><tr><td>T</td><td>TT</td><td>TT</td></tr></table></td><td>5</td></tr>
</table>

	All tall plants would be obtained. **If X was Tt** 		**T**	**t**
T	TT	Tt
T	TT	Tt | All tall plants would be obtained. (ii) **If X was TT** |	**T**	**T**
t	Tt	Tt
t	Tt	Tt | All tall plants would be obtained. **If X was Tt** |	**T**	**t**
t	Tt	tt
t	Tt	tt	 1:1 ratio of tall:short plants. *[Award marks if the cross is shown in any other correct manner.]* (b) 0.5 marks for each of the following: - (ii) would be helpful - In (ii), the ratios of offspring obtained were different for TT and Tt whereas in (i) the ratios were the same for TT and Tt so it would not be possible to determine whether X is TT or Tt based on (i).	
Q.125	1 mark for each of the following:	2

	- False. - Genetic drift causes a change in the population of species which can result in the wiping out of some variants completely which results in decreased variation in a population. *[Accept any other valid justification. No marks to be awarded if the correct justification is not written.]*	
Q.126	Genetic drift is a chance event that does not depend on a trait's suitability to the environment which drives natural selection.	1
Q.127	1 mark for each of the following: - Humans with amputated legs give birth to children with properly formed limbs. - This theory talks about the inheritance of non-genetic characteristics which do not affect the genetic makeup of an organism. *[Accept any other valid answer.]*	2
Q.128	0.5 marks for each of the following: - Yes it is linked to the sex chromosome/Y chromosome. - If it was not linked to the Y chromosome it would be seen in the daughters as well.	1
Q.129	1 mark for each of the following: (a) Over time, mutations and variations cause organisms coming from the same ancestor to accumulate a lot of differences causing them to look very different from each other. (b) It is possible for unrelated organisms to have similar-looking organs especially when they live in similar environments/undergo the same selective pressure. *[Accept any other valid answer.]*	2
Q.130	(a) - No she is not correct. *[0.5 marks]* - During dialysis, nitrogenous wastes such as urea leave the blood and enter the dialysing fluid by diffusion due to a concentration difference and so urea cannot be present in the fluid otherwise urea from the blood will not get excreted into the dialysing fluid. *[1 mark]*	2

	(b) both voluntary and involuntary	
Q.131	1 mark for each of the following: - Reabsorption of nutrients in the nephron is a process mainly driven by osmosis. - When some of the glucose from the blood is filtered in the urine, it does not get reabsorbed as the concentration of glucose is already high in the blood and so there is little/no concentration gradient causing glucose to be retained in the urine.	2
Q.132	0.5 marks for each of the following: - anaerobic - This step occurs in all organisms, even those that respire anaerobically and so this process is likely to be anaerobic. *[Accept any other valid answer.]*	1
Q.133	(a) 0.5 marks each for the following: - in dry and arid conditions/deserts - Since gas exchange is not happening in the day, it indicates that stomata is likely to be closed, which is common in dry conditions. (b) in the day	2
Q.134	- Plants P and R will bear fruits [0.5 marks for naming each plant] - Plant P has the female reproductive organs which can receive pollen and fertilisation can take place. [0.5 marks] - Plant R has both sexes on the same plant facilitating pollination and fertilisation. [0.5 marks]	2
Q.135	1 mark each for any TWO of the following: - At least one parent of the woman will also have the disease. - Other than her, some of her siblings would also have the disease. - In each generation, one or more individuals will have the disease. *[Accept any other valid answers.]*	2
Q.136	(a) The terrarium can be called an ecosystem because all the components of the terrarium are interacting with each other.	3

	(b) - The biotic components are the variety of plants and other organisms present in the soil. [1 mark] - The abiotic components are soil, sunlight, air and water. [give 1 mark if all the components are written]	
Q.137	True Neuronal coordination is faster due to rapid electrical signalling, direct point-to-point communication, and immediate responses, whereas chemical coordination relies on slower hormone diffusion through the bloodstream.	2
Q.138	(a) 0.5 marks for identifying the stimulus and 0.5 marks for naming the phenomenon. -roots growing downwards- stimulus: gravity, phenomenon: positive geotropism -shoot growing upwards-stimulus: sunlight, phenomenon: positive phototropism (b) The environmental factor that can be altered is adding a source of water/nutrients towards one side of the root. (c) The tropic movement that occurs when pollen tubes grow towards ovules is called chemotropism.	3
Q.139	(a) 0.5 marks for each keyword. Auxin in the plant promotes: -cell growth -cell elongation. (b) The light source should be at Side X for the shoot tip to bend (c) 0.5 marks for each point - When the light comes from one side of the plant, then the plant hormone auxin gets diffused towards the side of the shoot that is away from sunlight. - This concentration of auxin stimulates cell growth and elongation on the side of the shoot away from light.	3
Q.140	(a) 0.5 marks each for the following: - The deficiency disease is goitre.	3

	- T3 and T4 level for Ram is less than the given normal range while TSH is high. (b) 1 mark each for the following: - The geographical location of Ram indicated the possibility of low levels of Iodine availability in food. -The symptoms described indicated iodine deficiency.	
Q.141	(a)1 mark for each point - Blinking of eyes is not a reflex action. It is an involuntary action that happens with or without a stimulus. - Nia ducked down because of reflex action. (b)1 mark for each point -Nia's brain received the signal from the eyes through sensory nerves, and the brain processed this signal. - The brain sent the signal to the hand, through motor nerves to punch back	4
Q.142	(a) The gustatory receptors on the tongue help us to identify the taste of the food. (b) Fore brain has a specialized function of hearing. Crunch in the food can be heard, and this is processed by the forebrain	2