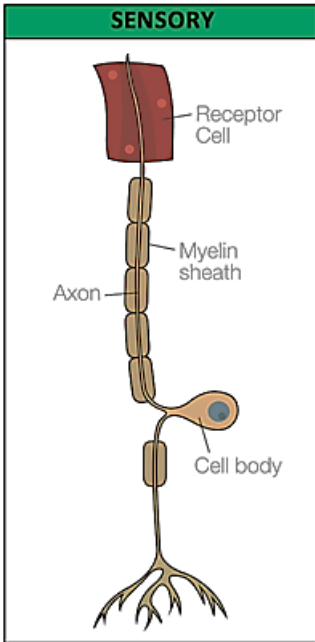
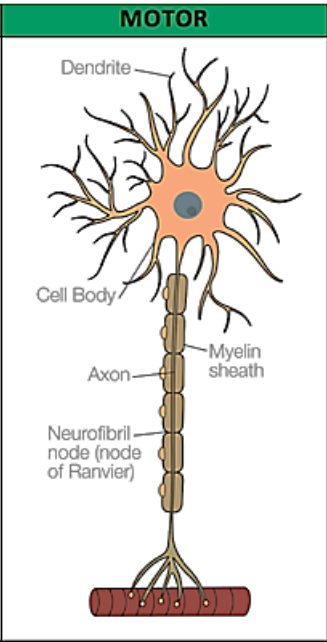
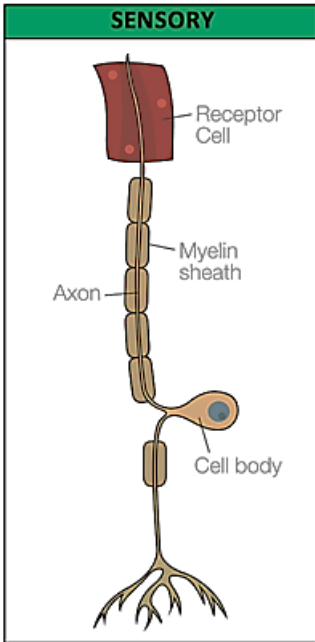
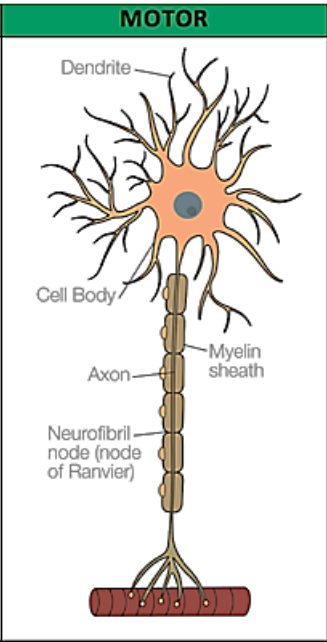
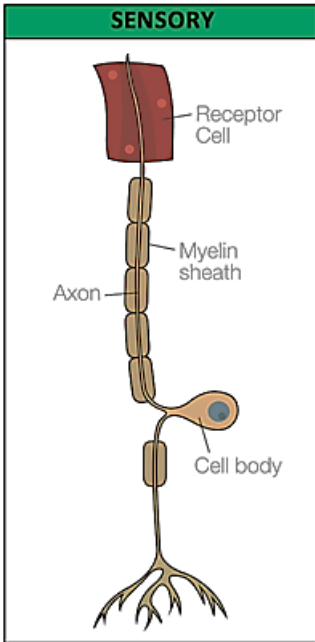
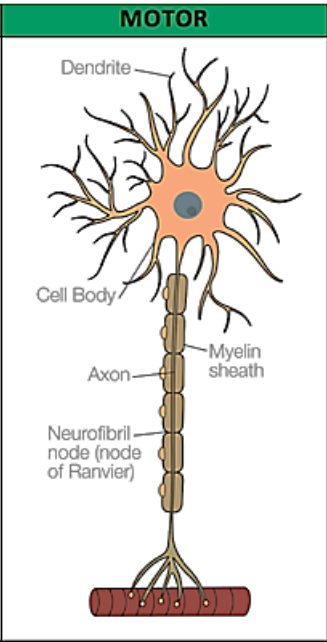
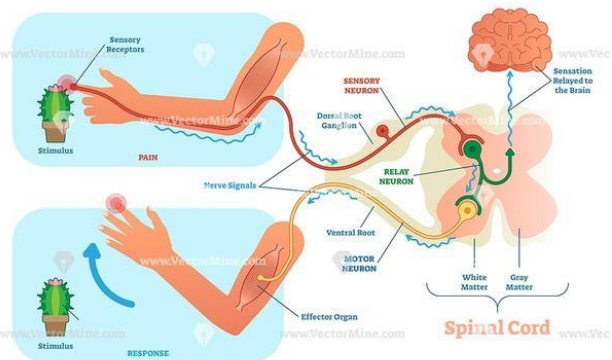
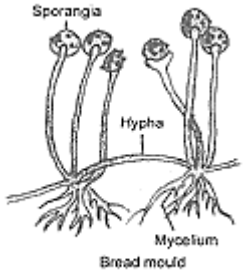


3ai	Amylase.	1	Accept “salivary” or “pancreatic amylase”.
ii	Maltose.	1	
bi	As time increases, the concentration of disaccharide increases. The rate of production decreases with time.	1 1	
ii	Initially all the active sites of the enzyme are filled by the substrate. The initial high rate of reaction is because enzymes are fully saturated. As the substrate concentration decreases the number of effective collisions decreases and therefore the reaction rate decreases.	1 1 1	Accept answers that refer to collisions with enzymes.
iii	Time.	1	
c	Add Benedict’s solution to a reducing sugar solution. Put in water bath to heat. Blue solution turns into a brick red precipitate.	½ 1 ½	
	Total	10	
4a	The heartbeat rate will increase until it reaches a plateau and stops increasing.	1 1	
bi	Red blood cells are rich in haemoglobin. The red blood cells have a biconcave shape. OR Red blood cells do not have a nucleus.	1 1	Any two.
ii	At high altitudes, a breath delivers less oxygen to the muscles. The body makes more red blood cells to deliver oxygen. Back at ground level the body will have more red blood cells to carry oxygen. So, more oxygen is carried to the muscles.	1 1 1	
c	The circulatory system is a double loop with blood moving from the heart to the lungs and back and to the body and back.	1 1	
	Total	9	
5ai	Less organisms may be trapped in large waste or eating waste e.g. plastics instead of food. Less leaching of toxic matter into the water. Less bioaccumulation of toxic organic matter in organisms	1 1	Any two.
ii	Less noise pollution decreases disturbance to organisms in ecosystems.	1	
bi	Increase in organic waste resulting in an increase in production of methane. OR	2	Any one.

	Increase in inorganic waste resulting in the filling in of landfills more quickly.		
ii	Increase in air, land and water pollution. Increase in energy consumption. Decrease in natural resources.	1 1	Any two.
	Total	7	
6a	Enzymes involved in the process of germination, are sensitive to pH and are denatured at an incorrect pH environment.	1 1	
b	Nitrates are a source of nitrogen which is used for the production of amino acids used to form proteins – the building blocks for growth. Magnesium is necessary for the synthesis of chlorophyll.	1 1	
c	Male – stamens. Female – carpel.	1 1	Accept “anthers”. Accept “ovary”. Do not accept stigma, style and filament.
di	Light OR smooth OR small.	1	Any one.
ii	Grow ragweed in soil of any pH values other than 6.	1	
	Total	8	
7a	Identical cells with diploid number of chromosomes.	½ ½	
b	Gametes have a haploid number of chromosomes. The diploid number is restored on fertilisation.	1 1	
c	Mother can be $X^I X^i$ or $X^I X^i$. Father must be $X^I Y$. Mother must be $X^I X^i$ as one son is normal. Mother gives X^i to this son while the father gives Y. For the other son mother gives X^I while the father gives Y. For the daughter mother gives X^I while the father gives X^i . So, Mother is $X^I X^i$ and father is $X^i Y$.	1 1 ½ ½ ½ ½ 1	No marks are rewarded if the Y chromosome carries the allele for the disorder (Y^i).
	Total	8	

Section B			
1a	Title and axes. Plotting of graph. Graph joined well. Good sized graph.	1 2 2 1	Do not award marks if axes are inverted.

b	The rate of photosynthesis increases as the distance from the lamp decreases.	2					
c	As the distance increases, the light intensity decreases. At high light intensity more light rays fall on chlorophyll pigments, increasing the rate of photosynthesis.	1 1					
d	Oxygen.	1					
e	Carbon dioxide OR water.	1	Any one.				
fi	At 40 cm from the lamp.	1					
ii	As the temperature increases the rate of photosynthesis increases until a temperature is reached beyond which enzymes are denatured.	1 1					
	Total	15					
2a	The messages are electrical impulses.	1	Accept “changes in concentration of specific ions across neuron membrane”.				
b	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #008000; color: white;"> <th style="width: 50%;">SENSORY</th> <th style="width: 50%;">MOTOR</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top;">  </td> <td style="text-align: center; vertical-align: top;">  </td> </tr> </tbody> </table>	SENSORY	MOTOR			1 2	For correct drawing For two correct labels
SENSORY	MOTOR						
							

c	<p style="text-align: center;">REFLEX ARC</p> 	2 2 1	<p>Correct drawing of neurones in correct position.</p> <p>4 Labels from the following: sensory neurone, motor neurone, relay neurone, cell body, white matter, grey matter, stimulus, effector.</p> <p>For direction of impulse.</p>
d	A hormone is a chemical messenger that is transported in the blood to a specific site or organ.	1 1	
ei	Insulin OR Glucagon	1	Any one.
ii	<p>For Insulin – converts glucose to glycogen in the liver/muscle. OR increases the absorption of glucose to all cells. OR increases absorption of glucose to liver and muscle. OR</p> <p>For Glucagon – converts glycogen back to glucose in the liver/muscle.</p>	1	Any one related to the hormone listed in ei.
iii	<p>When the blood glucose decreases below the set point, a message sent to the pancreas makes it secrete glucagon.</p> <p>When blood glucose increases, a message sent to the pancreas makes it secrete insulin.</p>	½ ½ ½ ½	
Total		15	
3ai	<i>cinerea</i>	1	Deduct ½ mark if the first letter is upper case and if it is not underlined.
ii		1 2	<p>For correct diagram.</p> <p>For 4 labels from: sporangium, hypha, mycelium, spores.</p>
iii	These fungicides are non specific or they may kill beneficial fungi such as decomposers as well.	1	

	Fungi may develop resistance to the fungicide.	1	
iv	A seed contains an impermeable outer coat called testa with a micropyle . The testa covers the embryo and the cotyledons .	1 1	½ mark for each biological structure.
bi	Amino acids	1	
ii	Peptides made up of C, H, O and N.	1	Mark awarded only if all 4 elements are listed.
iii	Bacteria.	1	Accept “Monera” (although outdated).
iv	Mutualism.	1	Do not accept “symbiosis”.
v	Bacteria produce ammonium salts that are used by the plants to produce proteins for growth. Plants produce sugars needed by bacteria for respiration.	1 1 1	
	Total	15	
4a	A process of respiration without the presence of oxygen. Usually aided by micro-organisms such as yeast and bacteria.	1 1	
b	Both are single celled organisms. Both have genetic material.	1 1	Accept DNA.
ci	Oxygen is not a reagent in this process.	1	
ii	Substrate: glucose.	1	
iii	Cellulose is a polysaccharide made of many glucose molecules.	1 1	
d	Alcohol can be produced in large quantities without destroying the environment. Alcohol produces less carbon dioxide than fossil fuels.	1 1	
ei	Large, brightly coloured petals. Scented. Nectar produced in flower. Abundant, large, sticky, heavy pollen. Small stamens and carpel inside flower. Sticky stigma.	1	Any one.
ii	Pollination is the movement of pollen from the stamens to the stigma of the same or other flower of the same species. Fertilisation is the fusion of male and female gametes.	1 1	Do not accept “the fusion of the pollen and ovule”.
iii	Ovary.	1	Accept “Ovule” OR “carpel”.
iv	Dicot.	1	
	Total	15	

5a	<p>Phototropism:</p> <ol style="list-style-type: none"> 1. It is a plant's response to light. 2. The roots are negatively phototropic. 3. The shoots are positively phototropic. <p>Geotropism:</p> <ol style="list-style-type: none"> 1. It is a plant's response to gravity. 2. The shoots are negatively geotropic. 3. The roots are positively geotropic. 	<p>1</p> <p>1</p> <p>1</p> <p>1</p>	Accept the first statement and any other from each set.
b	<p>Insects are arthropods with three pairs of legs.</p> <p>Arachnids are arthropods with four pairs of legs.</p>	<p>1</p> <p>1</p>	
c	<p>Eutrophication is a result of excessive richness of nutrients in a lake or other body of water, frequently due to run-off from the land, which causes a dense growth of algae.</p> <p>Bioaccumulation is the accumulation and enrichment of contaminants in the tissue of organisms, relative to that in the environment. It can lead to increased chemical concentration with higher trophic position in a food chain/web.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	
d	<p>Population:</p> <ol style="list-style-type: none"> 1. It is a group of individuals of a single species found in an area. 2. All the individuals of a population are morphologically and behaviourally similar. 3. Individuals of a population interbreed freely. 4. It is a small unit of organisation. 5. There is no relationship of eating and being eaten. <p>Community:</p> <ol style="list-style-type: none"> 1. It is grouping of individuals of different species found in an area. 2. Different members of a community are morphologically and behaviourally dissimilar. 3. Interbreeding is absent amongst different members of a community. 4. It is larger unit of organisation. 5. In a biotic community there is often a relationship of eating and being eaten. 	<p>1</p> <p>1</p> <p>1</p>	Accept the first statement of each and any other following statement.
	Total	15	