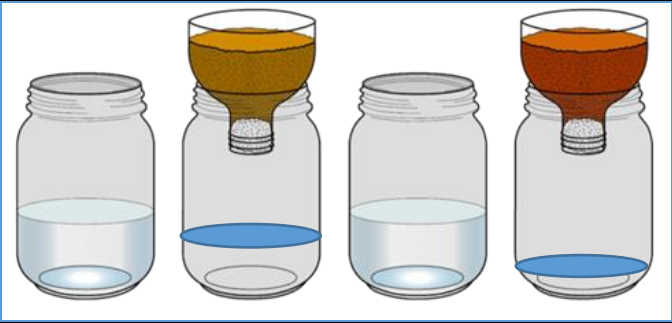


Annual Examinations for Secondary Schools 2019

YEAR 11 **BIOLOGY** **MARKING SCHEME**

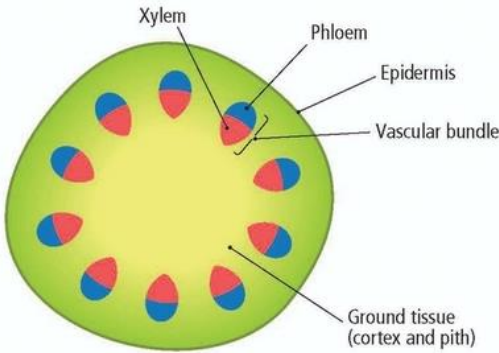
Question No.	Answer	Mark/s	Additional comments
Sect. A			
1a	B- <i>Chlamydomonas</i> ; D- <i>Paramecium</i> ; E- <i>Giardia</i>	1, 1, 1	Total 3 marks
bi	As protist C has chloroplasts it can photosynthesise in light, therefore synthesising its own food being autotrophic .	½, ½ ½, ½	Total 2 marks
ii	The flagellum propels protist C towards food / light.	2	
ci	Binary fission is an asexual mode of reproduction.	1	
ii	Advantage: Fast / short growth period / only one parent is necessary. Disadvantage: lowers chance of survival rate if protist is attacked by pathogen / daughter cells identical to parent cell / lacks genetic variation.	1 1	Any one Any one Total 2 marks
Total		10	
2ai		1 1	Accept any correct comparison with less water falling in jar of soil B (clay soil) than that of soil A. Total 2 marks
ii	Soil A, being loam soil, has different size particles and sufficient air spaces of different sizes – this holds a certain amount of water while Soil B, being clay soil, has large size particles and many small air spaces – this holds much more water.	1 1	Or equivalent Total 2 marks
iii	Volume of water, same amount of soil, same amount of cotton wool, same packaging of cotton wool.	1	Any one

b	Holds water and releases it to plants slowly. / Causes soil to aggregate, therefore improving soil structure and increasing permeability. / Reduces soil erosion.	2	Any one										
	Total	7											
3a	A tissue is a group of cells having the same structure and function.	2	Do not accept "a group of cells" only.										
bi	Structure X - cilia	1											
ii	Structures X waft pathogens (bacteria) embedded in mucus away from the respiratory surfaces.	1											
c	The nucleus controls the functions of the cells.	1											
	Total	5											
4a	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Statement</th> <th style="width: 30%;">Structure</th> </tr> </thead> <tbody> <tr> <td>Secretes the enzyme trypsin</td> <td>Pancreas</td> </tr> <tr> <td>Secretes an acidic juice that destroys bacteria in food</td> <td>Stomach</td> </tr> <tr> <td>The site where absorption of digested food occurs</td> <td>Ileum</td> </tr> <tr> <td>Produces bile</td> <td>Liver</td> </tr> </tbody> </table>	Statement	Structure	Secretes the enzyme trypsin	Pancreas	Secretes an acidic juice that destroys bacteria in food	Stomach	The site where absorption of digested food occurs	Ileum	Produces bile	Liver	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p>	Total 4 marks
Statement	Structure												
Secretes the enzyme trypsin	Pancreas												
Secretes an acidic juice that destroys bacteria in food	Stomach												
The site where absorption of digested food occurs	Ileum												
Produces bile	Liver												
bi	Humans are unable to digest cellulose. They do not produce cellulose digesting enzymes or do not harbour bacteria that produce cellulose digesting enzymes. The function of the colon is to absorb water back into the bloodstream.	1 1	Total 2 marks										
ii	Food not chewed has a small surface area to volume ratio and a small overall surface area for enzymes to work on. When food is chewed the surface area to volume ratio increases and there is a large overall surface area for enzymes to work on. This speeds the rate of reaction.	1 1	Total 2 marks										
	Total	8											
5a	A vertebrate is an animal with a backbone.	½ ½	Total 1 mark										
bi	Hair or fur / Mammary glands to produce milk / give birth to offspring / 4 chambered heart / external ear. Or equivalent.	1 1	Any two Total 2 marks										

ii	<u>Eranaceus algerius</u>		2	1 mark for correct capital for genus and small for species 1 mark for underlined words
c	hedgehog		1	
Total			6	
6a	Condition	Rate of Photosynthesis vs Rate of Respiration	Overall result	
		High rate of respiration but no photosynthesis	Oxygen, taken in from air and carbon dioxide, is released.	1, 1 Do not accept answers to photosynthesis vs respiration if there is no reference to both processes.
	Dawn or dusk		Oxygen, produced from photosynthesis, is used for respiration.	1, 1 Accept equivalent.
	Midday	Rate of photosynthesis is much higher than rate of respiration.		1, 1 Accept "Mid-morning / Mid-afternoon".
				Total 6 marks
bi	Enzyme activity increases with temperature up to the optimum temperature. Photosynthesis is a chemical reaction that needs enzymes to speed it up.		1 1	Total 2 marks
ii	The range of temperatures is the optimum range where enzymes work at the highest rate.		1 1	Total 2 marks
iii	The optimum range has been exceeded. Enzymes have been denatured by excessive heat.		1 1	Total 2 marks Accept "broken down / warped" instead of "denatured". Do not accept "enzymes die".
Total			12	

7a	Parents: Mother $X^H X^h$ Father $X^h Y$	1	Total 4 marks									
	Gametes: X^H X^h X^h Y	1										
	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td></td> <td>X^H</td> <td>X^h</td> </tr> <tr> <td>X^h</td> <td>$X^H X^h$</td> <td>$X^h X^h$</td> </tr> <tr> <td>Y</td> <td>$X^H Y$</td> <td>$X^h Y$</td> </tr> </table>			X^H	X^h	X^h	$X^H X^h$	$X^h X^h$	Y	$X^H Y$	$X^h Y$	1
		X^H		X^h								
X^h	$X^H X^h$	$X^h X^h$										
Y	$X^H Y$	$X^h Y$										
25% - $X^H X^h$ - affected daughter; 25% $X^h X^h$ - unaffected daughter 25% - $X^H Y$ - affected son; 25% $X^h Y$ - unaffected son	1											
b	All male offspring get the X chromosome from the mother and the Y chromosome from the father. As the mother is unaffected her genotype is $X^H X^h$ and will pass on the unaffected trait to her sons.	1 1	Total 2 marks									
c	Dairy products, cod liver oil, tuna, salmon, egg yolks	1	Any one or equivalent									
Total		7										

Sect. B			
1ai	Jointed limbs / segmented / exoskeleton	1, 1	Any two Total 2 marks
ii	Insects have 3 pairs of jointed limbs while arachnids have 4 pairs of jointed limbs.	2	
iii	Plants contain chloroplasts and have cellulose cell walls. They store carbohydrates as starch. Fungi are saprophytic or parasitic organisms. Have cell walls made of chitin. Store carbohydrates as glycogen.	1	Any one
		1	Any one Total 2 marks
bi	Decomposition occurs when living organisms die and cells begin to break down releasing nutrients.	1	Or equivalent Total 2 marks
		1	
ii	Plants \longrightarrow Springtails \longrightarrow Wolf spider Do not accept fungus as a producer.	2	1 mark for correct organisms 1 mark for arrows
iii	A food web is a group of interconnecting food chains.	2	
c	<p style="text-align: center;">Fig. 2.35 : Carbon cycle</p>	3	Accept a more complex diagram.

	Total	15	
2ai	In transpiration water is carried from the roots, up the stem to leaves and flowers. This allows movement of water to all cells for turgidity and photosynthesis and carries with it ions and hormones needed by cells.	1 1 1	Total 3 marks
ii	Water vapour from soil is not released into the surrounding air. Thus any water droplets are the result of transpiration and condensation.	1 1	Total 2 marks
iii	Humidity, wind speed, temperature, light intensity	1, 1	Any two Total 2 marks
b		3 1 1	For diagram Xylem label Phloem label Total 5 marks
ci	Xylem	1	
ii	contains dead cells (with lignin cell wall) that have formed one long continuous tough tube.	1 1	Total 2 marks
	Total	15	
3a	Ovary	2	
b	From day 1 to day 4, oestrogen increases slightly. From day 5 to 14, there is a sudden increase in oestrogen until it peaks on day 12-13. From day 15 to 28, oestrogen initially decreases suddenly and then remains low until a new cycle starts.	1 1 1	Total 3 marks
ci	Menstruation is the sloughing of the uterine lining. / breakdown of the uterine lining.	2	Any one
ii	The growth of lining is important for implantation to occur. The proliferation of blood vessels will allow for the initial diffusion of substances from the mother to the growing ball of cells / embryo.	2 2	Total 4 marks
di	The egg remains viable for 24 hours after ovulation. Therefore if the sperm meets with the ovum during that period, fertilisation may occur.	2	
ii	Zygote	1	
iii	Uterus	1	
	Total	15	

4a		3 3	For drawing Cortex, medulla, pelvis, renal artery, renal vein, ureter; ½ mark each Total 6 marks										
bi	Nephron	2											
ii	Osmoregulation is the control of water and salts concentrations. / Keeping a constant osmotic balance.	2	Any one										
ci	<table border="1"> <tr> <td>Artery</td> <td>Vein</td> </tr> <tr> <td>Narrow lumen</td> <td>Wide lumen</td> </tr> <tr> <td>Thick muscular wall</td> <td>Thin muscular wall</td> </tr> <tr> <td>Thick wall</td> <td>Thin wall</td> </tr> <tr> <td>No valves</td> <td>Have valves</td> </tr> </table>	Artery	Vein	Narrow lumen	Wide lumen	Thick muscular wall	Thin muscular wall	Thick wall	Thin wall	No valves	Have valves	2 2	Any two Accept only a completely correct contrast. Total 4 marks
Artery	Vein												
Narrow lumen	Wide lumen												
Thick muscular wall	Thin muscular wall												
Thick wall	Thin wall												
No valves	Have valves												
ii	Capillaries	1											
	Total	15											
5ai	Similarity – Both are symbiotic relationships. Difference – In mutualism both partners benefit whereas in parasitism one partner benefits. The parasite benefits at the expense of the second partner, the host.	2 2	Total 4 marks										
ii	Similarity – Both are processes of cell division. Difference – Mitosis produces 2 diploid daughter cells identical to each other and the parent. Meiosis produces 4 haploid daughter cells different from each other and the parent cells.	2 2	Accept any one difference. Total 4 marks										
iii	Similarity – Both are groups of the plant kingdom. Difference – Mosses have no vascular tissue and have simple stems and leaves. Need water to reproduce. Conifers have vascular tissue, complex roots, stems and leaves. They do not need water to reproduce but need wind.	2 2	Accept any one difference. Total 4 marks										
b	Water is the main constituent of organisms. Water is necessary as a solvent / for the transport of nutrients / for cellular reactions / as a reagent.	1 2	Any two Total 1 mark										
	Total	15											