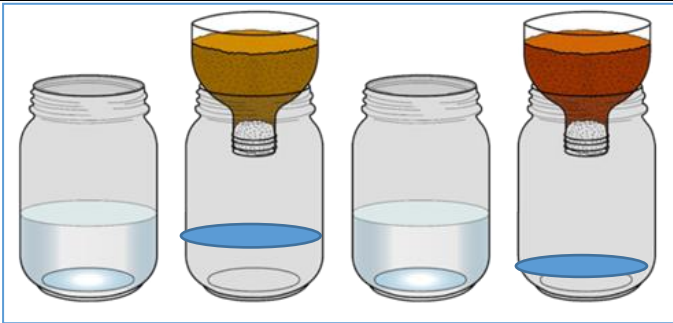


Annual Examinations for Secondary Schools 2019

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	Statement	Structure	Total 4 marks	
	Secretes the enzyme trypsin	Pancreas		1
	Secretes an acidic juice that destroys bacteria in food	Stomach		1
	The site where absorption of digested food occurs	Ileum		1
	Produces bile	Liver		1
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	<p>Do not accept answers to photosynthesis vs respiration if there is no reference to both processes.</p> <p>Accept equivalent.</p> <p>Accept "Mid-morning / Mid-afternoon".</p> <p>Total 6 marks</p>	
		High rate of respiration but no photosynthesis	Oxygen, taken in from air and carbon dioxide, is released.		1, 1
	Dawn or dusk		Oxygen, produced from photosynthesis, is used for respiration.		1, 1
	Midday	Rate of photosynthesis is much higher than rate of respiration.			1, 1
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	1											
25% - $X^H Y$ – affected son; 25% $X^h Y$ – unaffected son												
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	predator	1	
ii	ecosystem	1	
b	Jointed limbs / segmented / exoskeleton	1, 1	Any two Total 2 marks
c	Insects have 3 pairs of jointed limbs while arachnids have 4 pairs of jointed limbs.	2	Or equivalent
di	A food web is a group of interconnecting food chains.	1	
ii	Plants → Springtails → Wolf spider Do not accept fungus as a producer	2	1 mark for organisms in correct order 1 mark for arrow in correct direction
e	When the Arctic warms up, the wolf spiders eat a different prey resulting in more springtails. The higher the no. of springtails, the more they eat decomposers, the less decomposition occurs and the less greenhouse gases are produced.	1 2	Total 3 marks
f	Carbon Carbon is an element that is an important constituent of carbohydrates, fats and proteins and nucleic acids that make up organisms. In the cycle carbon is moved from the atmosphere and oceans to living organisms and back.	1 1 1	Total 3 marks
Total		15	

2ai	In transpiration water is carried from the roots, up the stem to leaves and flowers.	1	Total 3 marks
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	In the leaves water diffuses to the air spaces of the mesophyll and evaporates from the pores (stomata) of leaves and stems.	1 1	
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		2 1 1	For diagram Xylem label Phloem label Total 4 marks
ci	Sucrose	1	
ii	Phloem contains living cells with sieve tubes and accompanying companion cells.	1 2	Total 3 marks
	Total	15	
3a	The kidney is the main organ of osmoregulation. ADH secreted from the pituitary acts on the collecting duct to absorb more water back into the bloodstream when blood pressure is low. Salts are absorbed back mainly from the loop of Henle.	1 2 1	Total 4 marks
b	Arteries have a thicker and more muscular wall than veins. Arteries receive blood from the heart where the pressure is high. The thick muscular wall maintains this high pressure. Veins receive blood from capillary networks at a much lower pressure.	1 1 1 1	Total 4 marks
c	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	Total 3 marks Any two
d	It receives impulses from the sensory receptors and relays and sends impulses to effectors. Regulates many functions including movement, posture and balance. Regulates breathing and heart rate.	1 1 1 1	Accept reference to association areas. Total 4 marks
	Total	15	
4ai	Ovary	1	Accept "follicle cells for oestrogen

			and corpus luteum for progesterone".
aii	Pituitary	1	Accept "Anterior Pituitary".
b	FSH stimulates the / a follicle within the ovary to develop and mature. The follicle cells produce oestrogen that decreases the production of FSH from the pituitary.	1 1	Total 2 marks
ci	As progesterone starts to increase further growth of lining occurs, including proliferation of blood vessels / spaces within the lining.	1 1	Total 2 marks
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.	1 1	Total 2 marks
d	The egg remains viable for 24 hours after ovulation. Therefore if the sperm meets with the ovum during that period, fertilisation may occur.	1 1	Total 2 marks
ei	Sperms are ejected at the top of the vagina near the cervix. They swim through the cervix, up the uterus. And swim into the Fallopian tubes / oviduct. Fertilisation occurs in the Fallopian tubes.	1 1 1 1	Total 4 marks
ii	Zygote	1	
	Total	15	
5a	Both are symbiotic relationships. Mutualism is an ecological interaction between two species from which both partners benefit whereas in parasitism one partner benefits. The parasite benefits at the expense of the second partner, the host.	1 1 1	Total 3 marks
b	Both tissue fluid and lymph are fluids in the human body. Tissue fluid is the fluid present in between the cells of tissues. It contains components like sugars, salts, fatty acids and allows exchange of nutrients and waste products. Lymph is the fluid circulating in the lymphatic vessels. It contains components like fatty acids and maturing lymphocytes.	1 1 1 1 1	Total 5 marks Any two properties of tissue fluid Any two properties of lymph
c	Both are processes of cell division. Mitosis produces 2 diploid daughter cells identical to each other and the parent.	1 1 ½	Total 4 marks

	Meiosis produces 4 haploid daughter cells different from each other and the parent cells.	1 ½	
d	Both are plants. Mosses have no vascular tissue / have simple stems and leaves. / Need water to reproduce. Conifers have vascular tissue / complex roots / stems / leaves. / They do not need water to reproduce but need wind.	1 1 1	Any two properties of mosses Any two properties of conifers
	Total	15	