Coimisiún na Scrúduithe Stáit
State Examinations Commission

LEAVING CERTIFICATE 2008

MARKING SCHEME

BIOLOGY

ORDINARY LEVEL

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Leaving Certificate 2008 Biology – Ordinary Level

Section A ----------Answer 5 questions (20 marks each)

1.			**Answer any <u>four</u>**		**2(7)+2(3)**
	(a)		caterpillar		
	(b)		decrease		
	(c)		Producer / food for caterpillar / 1st trophic level / Plant/ **Autotroph**		
	(d)		blue tit/ sparrow hawk		
	(e)		Energy / food		
2.					**2(7)+2(3)**
			Column A	**Column B**	
			A protein present in blood	**haemoglobin**	
			An element always present in proteins along with C H O	nitrogen	
			A protein which changes reaction rates	enzyme	
			The end product of protein digestion	amino acid	
			A structural protein	Keratin / Haemoglobin	
3.					**2(7)+3+2+1**
	(a)		Stage 1 of respiration requires oxygen	**F**	
	(b)		Stage 1 of respiration takes place in the cytoplasm	**T**	
	(c)		Stage 2 of respiration also takes place in the cytoplasm	**F**	
	(d)		Some of the energy released in respiration is lost as heat	**T**	
	(e)		Lactic acid is a product of anaerobic respiration	**T**	
4.					**2(7)+3+2+1**
	(a)		aorta		
	(b)		Oxygenated (watch follow on)		
	(c)		Ventricle		
	(d)		pumps further/ maintains blood pressure / greater activity		
	(e)		stops back flow (of blood) / blood from atrium to ventricle		
5.					**2(7)+3+2+1**
	(a)		adenine/ cytosine		
	(b)		triplet/codon / (part of) a gene / genotype [allow nucleotide]		
	(c)		nucleus/ chromosome (allow gene)		
	(d)		Gene / genetic (allow any term implying inheritance)		
6.					**2(7)+3+2+1**
	(a)		A = hair B = muscle		
	(b)		Location of X (opening of sweat duct)		
	(c)		urea/ salt/ named salt/ lipids/ hormones		
	(d)		(erect) hair / hair traps air/ arteriole contracts (and keeps blood warm) / pores close / adipose (tissue)/Goose pimples		

Section B ---------- Answer any two questions (30, 30)

7	**(a)**			**5, 1**
		(i)	free from (micro)organisms or living things or named organism	
		(ii)	autoclave/ heat qualified e.g. high or 100^{o}C / boiling / steam / any anti-bacteria agent or named / U.V light	
	(b)			**4(5) + 2(2)**
		(i)	Petri dish / (agar) plate	
		(ii)	(nutrient / malt) agar / (Allow 'nutrients ' and 'jelly'')	
		(iii)	sterilise cork borer/ cut / pieces of leaf or (full) leaf/ use sterile forceps/ attach upper surface of leaf / to petroleum jelly on inside of lid /any one safety precaution	**Any two**
		(iv)	**(More than 2)** days **or 24 hours**	
		(v)	pink or dots or reference to distribution	
8	**(a)**			**5, 1**
		(i)	Any correct anatomical reference	
		(ii)	Any correct anatomical reference	
	(b)			**4(5) + 4**
		(i)	Comparison /control / resting / normal / (breathing rate or pulse)	
		(ii)	Method described /count number of breaths or number of pulses /per unit time **OR** sensor (data logger)	
		(iii)	Exercise / description of exercise/ increased exercise/ breathing rate or pulse measured/ repeat/ average / **compare / record / result**	**Any two**
		(iv)	Increases / comment on return to normal / different	
9	**(a)**			**5, 1**
		(i)	Growth	
		(ii)	dormancy	
	(b)			**4(5) + 2(2)**
		(i)	type of seed (monocot or dicot or gymnosperm or angiosperm))/ name of seed	
		(ii)	Provide suitable condition(s)	
		(iii)	anaerobic jar or other	
		(iv)	put in fridge or cold environment (accept freezer or oven)	
		(v)	i. All conditions – growth (mandatory point) <u>one of the following</u> i. no oxygen – no germination ii. or low temperature – no germination iii. or no moisture – no germination	**Two pts – Mandatory + one other**

Section C ---------- Answer any four questions (60, 60, 60, 60)

10	**(a)**			**6, 3**
		(i)	Producing nitrogen compounds	
		(ii)	Bacteria / monera / Lichens/ Clover / Legumes	
	(b)			**7(3) + 6**
		(i)	name of ecosystem	
		(ii)	two habitats	**Any two**
		(iii)	named animal	
			adaptation	
		(iv)	named plant	
			transect / quadrat/ random/ count or cover/ repeat / identify / record / average	**Any two**
	(c)			**4(3) + 2(6)**
		(i)	harmful change (to environment) or example	
		(ii)	Example (other or same explained)	
		(iii)	two ways of prevention or control	**Any two**
		(iv)	waste produced/ must be disposed safely/ recycled / re-used / reduce / example of waste/ how managed/ role of micro-organisms	**Any two**
11				**6, 3**
	(a)	(i)	structure found in nucleus/ reference to DNA or genes or hereditary material	
		(ii)	n / 23 / half of diploid/ single set of chromosomes / contains one of each type or pair of chromosomes / reference to meiosis, gamete, sex cell	
	(b)			**9(3)**
		(i)	allele – a form of a gene/ types of gene / Bb	
			Dominant -prevents expression of recessive / Bb / stronger / always wins out when present	
		(ii)	Seán – brown Máire – red	
		(iii)	1. B, b 2. Bb bb	**Two pts** **Two pts**
		(iv)	50% or 1 in 2	
	(c)			**4(3) + 2(6)**
		(i)	change / producing new organisms / example	
		(ii)	Darwin / Wallace	
		(iii)	organisms have variations/ that are inherited/ beneficial / will reproduce/ struggle for existence / pass on these variations / 'Survival /of fittest' / origin of species	**Any two**
		(iv)	fossils/ comparative anatomy/ embryos/ DNA changes/ / Horse / bones	**Any two**

12	**(a)**			**6, 3**
		(i)	leaf	
		(ii)	Chloroplast / granum / **Stroma**	
	(b)			**9(3)**
		(i)	Light / sun	
		(ii)	Lack of oxygen/ lack of food (energy)/ plants die / excess CO_2 / animals die	**Two pts**
		(iii)	1. protons (Hydrogen (ions)) / electrons/ oxygen / OH- (Water splits into H^+ & OH^- merits 3(3)) 2. electrons pass to chlorophyll / ATP protons stored / NADPH / used in dark phase oxygen released into air/ respiration OH^- to water & O_2	**Three pts** **Three pts**
	(c)			**6 + 6(3)**
			Diagram of Apparatus (Plant, variable, container) type of plant or named plant/ control/ factor kept constant/ how variable altered/ how rate was measured / time / thermometer / water bath / adjust / bubbles / lamp / ruler/ result /conclusion / record **/** repeat **/** average	**6, 3, 0** **Six pts – written or labelled**
13	**(a)**			**3(3)**
		(i)	1. liver 2. gall bladder	
		(ii)	Duodenum / (small) intestine / ileum	
	(b)			**6(2) + 3(5)**
		(i)	**A** = oesophagus **B** = stomach **C** = small intestine/ileum/ jejunum **D** = rectum **E** = appendix **F** = large intestine/ colon / Bowel	
		(ii)	push food along gut / mechanical digestion / prevents constipation	
		(iii)	Stomach / ileum / **intestine** /villi / (colon) / shoulder vein	
		(iv)	by diffusion (into villi) / (allow both active transport & osmosis) / absorption	
	(c)			**8(3)**
		(i)	B = acidic C = alkaline	
		(ii)	starch maltose	**Two pts**
		(iii)	digest cellulose/ produce (release) vitamins/ keep harmful bacteria at bay / immunity (reference to health) / formation of faeces	**Two pts**
		(iv)	getting rid of (undigested food waste) **D** [watch a possible follow-on here from (b) (i)]	**Two pts**

14			**Answer any two of (a), (b), (c).**	**(30, 30,)**
	(a)			**6(1) + 8(3)**
		(i)	A = anther/stamen/ androecium B = carpel / ovary / ovule / gynoecium C = sepal / calyx D = receptacle	**Four pts**
		(ii)	A (watch for follow-on)	
		(iii)	Transfer/ of pollen/ (allow anther to stigma)	**Two pts**
		(iv)	1. brightly coloured petals / anthers within petals, nectaries, 2. feathery stigmas, anthers outside petals, petals absent or reduced.	**Three pts** **Three pts**
		(v)	fertilisation	
	(b)			**3(1)+5(3)+2(6)**
		(i)	diagram labels (iris, pupil)	
		(ii)	dim light pupil large / Iris small (watch follow-on)	
		(iii)	back of the eye / (accept behind lens)	
		(iv)	rods/ cones	**Two pts**
		(v)	rods - more numerous/ detect black and white / work in dim light/ found all over retina cones – less numerous/ detect colours / work in bright light only/ found mostly in fovea (Relate to original order)	**Any one pt**
		(vi)	carries message to brain	
	(c)			**6 + 4(1)+4(5)**
		(i)	Diagram (Diagram to show, Trachea, Bronchus & Lungs) labels (larynx, trachea, bronchus, bronchiole)	**6, 3, 0** **Labels -Four pts**
		(ii)	exchange gases/ carbon dioxide out/ oxygen in / increase surface area / **diffusion**	
		(iii)	name of breathing disorder (Asthma, Pleurisy, Bronchitis, Cancer, Hay Fever, Cystic Fibrosis, pneumonia…)	
		(iv)	Possible cause Treatment	**Two points**

15			Answer **any two** of (a), (b), (c).	**(30, 30)**
	(a)			**10(3)**
		(i)	movement of water (essential point) through semi-permeable membrane / from region of high osmotic potential to low osmotic potential/ from high concentration of water to low concentration of water/ from dilute solution to concentrated solution	**One Pt** **Any one of these pts**
		(ii)	**Describe or show** - apparatus/ type of membrane/ dilute solution or (**distilled**) water/ concentrated solution or tissue/ time period/ how change was observed / control	**Four pts**
		(iii)	Vascular tissue / xylem	
		(iv	tube-like shape/ narrow / hollow / pits in walls/ strong walls / lignin	
		(v)	phloem sugar / named sugar / sap / water / food	**Two pts**
	(b)			**10(3)**
		(i)	a - blood without cells/ watery liquid part of blood b - carries dissolved substances /named substance / waste /hormones /gases /blood clotting agent/ water / antibodies / proteins / inorganic salts / fibrinogen / CO_2 / Bicarbonate / **Heat**	
		(ii)	**a** - red blood cell / carries oxygen (also carries carbon dioxide) **b** - white blood cell / defence **c** – (allow Platelet / Blood Clotting)	**Any two types + function**
		(iii)	A/ B/ AB/ O [Four correct **9**,Three correct **6,** two correct **3]**	
		(iv)	transfusion/ to avoid reaction by mother to foetus/ to prevent loss of foetus	
	(c)			
		(i)	Fungi	**3**
		(ii)	Diagram (Stolon, Sporangiophore, Sporangium labels (Three)	**6, 3, 0** **3(1)**
		(iii)	Diagram (Structure like H showing zygote) labels or **show -** hyphae + and -/ gametangia/ gametes/ fuse/ zygote/ zygospore/ meiosois / germinates/ sporangium/ spores/ dispersal / new fungus	**6, 3, 0** **Three pts 3(2)**
		(iv)	Beneficial example (name or benefit) Harmful example (name or disease)	