Coimisiún na Scrúduithe Stáit
State Examinations Commission

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Bitheolaíocht *Gnáthleibhéal*

Marking Scheme *Leaving Certificate Examination, 2005*

Biology *Ordinary level*

Leaving Certificate Biology
Ordinary Level
Marking Scheme

Section A.

Any **five** questions from this section. Each question carries 20 marks.

1. any four – **2(7) +2(3)**

(a) Biosphere – (part of earth) where life exists
(b) Habitat – (part of environment) where organisms / plants / animals live
(c) Consumer – organism that consumes another organism / heterotroph / end of food chain
(d) Producer – organism producing food (organic material)/ autotroph / bottom of food chain
(e) Niche – position of an organism in its ecosystem / functional role of organism

2. **5 + 5 (3)**

Structure	Cytoplasm	Cell Wall	Chloroplast	Nucleus	Vacuole
Animal Cell				✓	✓
Plant Cell		✓	✓	✓	✓

N.B. One wrong cancels one right for Cell Wall and Chloroplast.

3. **7 answers** **2(5) + 5(2)**

(a) A = Anther B = Filament
(b) A
(c) carpel / stigma / female / ovary / style / ovule
(d) Transfer of pollen from one flower / plant to another
(e) Wind / animal / named animal **any two**

4. **5 answers** **2(7) + 3(2)**

(a) A = chromosome (chromatid) B = spindle (fibre) / thread /cord
(b) Chromosomes (chromatids) being pulled apart (going to opposite ends of cell)/anaphase
(c) 2
(d) Reproduction / growth / multiply

5. **10 answers** **2(6) + 8(1)**

	Carbohydrate	Protein	Fat
Oxygen	**Done**	✓	✓
Nitrogen	**Done**	✓	**X**
Hydrogen	✓	✓	✓
Carbon	✓	✓	✓

6. **10 answers** **2(6) + 8(1)**

(a) (i) A = contractile/ vacuole B = cytoplasm / endoplasm
C = pseudopod / false foot D = nucleus / organelle
(ii) Protista / Protoctista

(b) (i) A = flagellum B = DNA /chromosome/ nucleoid) **not nucleus**
C = cell wall / Membrane D = capsule (slime layer)
(ii) Monera (Prokaryotae)

Section B

Answer any two questions from this section.
Each question carries 30 marks.

7.	(a)	(i)	Movement or diffusion of water	**3**
		(ii)	Allows some molecules through /Visking tubing / cell membrane	**3**
	(b)	(i)	Diagram (minimum = 2 solutions & membrane)	**6, 3, 0**
			Label - (title may be considered a label)	**3**
		(ii)	water / water plus solute / membrane or tissue / observe or result / time **(If 'set up as above' – then diagram must be fully labelled accordingly)**	**4(3)**
		(iii)	tissue or membrane swollen / water movement	**3**
8.	(a)	(i)	organic/ biological/ protein catalyst	**3**
		(ii)	fits (substrate)/ active site / folded /can change shape	**3**
	(b)	(i)	name of enzyme **} matching**	**3**
		(ii)	name of substrate	**3**
		(iii)	Diagram (minimum = beaker, solution, temp. reference)	**6, 3, 0**
			Label – (title may be considered a label)	**3**
		(iv)	no more product/colour change / no more bubbles / no more foam	**3**
		(v)	water bath/different temperature treatments / Bunsen / thermostat	**3**
		(vi)	graph (horizontal line or multi-peaked graph not acceptable)	**3**
9.	(a)	(i)	growth/sprouting	**3**
		(ii)	chemical (enzyme) reactions/ dissolve stored food/swell testa / a condition of germination	**3**
	(b)	(i)	Diagram (minimum = test tube, seeds, variable)	**6, 3, 0**
			Control	**3**
			Label – (title may be considered a label)	**3**
		(ii)	presence of variable / absence of variable	**2(3)**
		(iii)	results of experiment	**3**
			results of controls	**3**

Section C

Answer any **four** questions from this section.
Each question carries 60 marks.

10. (a) (i) organisms and their (non-living) environment **3**

(ii) any 2 named ecosystems (e.g. sea-shore / hedgerow / forest / grassland / lake / terrestrial / land/ aquatic **2(3)**

(b) (i) A = Diving beetle B = Water mite C = *Hydra* D = Pond snail
E = Nematode F = Planarian G = Leech **7(3)**
(NB – Check exam book for answers)

(c) (i) an undesirable change in the environment **6**

(ii) any valid activity **6**

prevention **3**

(iii) conservation – protection / preservation /management of the environment **6**

(iv) food source/ balance of nature/ biodiversity/ prevention of extinction/ health of planet/ aesthetic / recreational /O_2 / CO_2 (not "for clothes") any three **3(3)**

11. (a) (i) $C_6H_{12}O_6 + (6)O_2$ (or words) **2(3)**

(ii) chloroplast **3**

(b) (i) hydrogen (proton) /oxygen/ electron or energy or ATP **3(3)**

(ii) Hydrogen /protons (released into pool & combine with CO_2) to form glucose) / oxygen used in respiration OR released / electrons are passed to chlorophyll/ **3(3)**

(iii) stoma / guard cells **3**

(iv) increase day length / artificial light/ increase carbon dioxide level / increase in temperature level **3**

(c) (i) release of energy/ oxidation of food **6**

(ii) to provide energy or named metabolic activity **6**

(iii) respiration in presence of oxygen **6**

(iv) aerobic **3**

(v) allow any example of "industrial fermentation" **2(3)**

Organism **3 marks**	**Product** **3 marks**
bacteria	beer/ wine/ yoghurt/ enzymes/ drugs/ hormones/ antibiotics/ methane (biogas)/ etc.
Fungus / yeast	carbon dioxide/ wine/ beer/ single cell protein/ antibiotics

12. (a) (i) 1. Pulmonary artery **3**
2. Pulmonary vein **3**

(ii) carbon dioxide **3**

(b) (i) A = larynx (voice box) B = trachea (wind pipe) C = bronchus D = bronchiole **4(3)**

(ii) Alveolus **3**

(iii) To produce sound or speech **3**

(iv) To keep trachea open / prevent collapse of trachea / protection of trachea **3**

(v) At the back of the throat / top of windpipe / oesophagus **3**

(vi) To prevent food entering trachea / wrong way / prevent choking **3**

(c) (i) diaphragm/ intercostal **6 + 3**

(ii) diaphragm contracts (lowers) / intercostal muscles contract /ribs move up and out / increased volume of thoracic cavity / pressure decreases / intercostals relax / air rushes in / diaphragm relaxes / volume decreases / pressure increases / air pushed out / inhale / exhale **<u>any two</u>** **2(3)**

(iii) name/cause/prevention or treatment **3(3)**

<u>asthma</u>/ allergic response or genetics or smoking or narrowing of bronchioles or infection or anxiety / use of inhaler or avoidance of allergens / exercise .

<u>bronchitis</u>/ infection or narrowing of bronchi/ antibiotics (for bacterial infection) / cancer of the lungs / MS effecting diaphragm.

13. (a) (i) A and a
(ii) AB Ab aB ab } Any two points **6 + 3**

(b) (i) adenine, thymine, guanine, cytosine or letters A,T,G,C **4(3)**

(ii) three bases / code for one amino acid **3**

(iii) information (code) is copied to RNA molecule **3**

(iv) ribosome **6**

(c) (i) organisms now existing/ have descended from previous types/ by (genetic) change / natural selection / response to environmental change /over time **<u>any two</u>** **2(3)**

(ii) organisms best suited to environment/ have greater chance of breeding/ and survive ['survival of the fittest' = 2(3)] **<u>any two</u>** **2(3)**

(iii) Darwin / Wallace **3**

(iv)
- Fossil/series showing change or example/ change related to environment /common descent or ancestry or explained **OR**
- Anatomy / homologous structure or bones (or explained)/example of/adaptive radiation (or explained)/example of /common descent or ancestry **OR**
- Embryology/similarity between embryos/ two examples from fish, amphibians, reptiles, birds, mammals/ adult forms different /common descent or ancestry

<u>any two</u> points from one of the above **6 + 6**

14. Any two of (a), (b), (c).

(a)	(i)	A = cortex B = medulla/pyramid C = pelvis D = ureter		**4(3)**
	(ii)	bladder		**3**
	(iii)	cortex (A) / nephron /glomerulus / Bowman's capsule		**3**
	(iv)	cortex (A) /medulla (B) /nephron/convoluted tubule / loop		**3**
	(v)	urea /water /salt		**3**
	(vi)	skin/lungs / liver		**3**
		water/carbon dioxide/urea / salt / bile /sweat (not mentioned in (v))		**3**
(b)	(i)	diagram (ovaries/oviducts/uterus/vagina)		**6, 3, 0 + 2(3)**
	(ii)	fertilisation located in oviduct } Pointed or mentioned		**3**
		Implantation indicated in uterus		**3**
	(iii)	monthly cycle in female / menstruation or lining of uterus (endometrium)shed / blood discharged / F.S.H./ Graffian follicles with eggs / secrete oestrogen / endometrium thickens / L.H. / ovulation / corpus luteum / progesterone / (if no fertilisation then) lining breaks down/ any four		**4(3)**
(c)	(i)	to prevent back flow of blood		**6**
	(ii)	blood is under pressure / blood from heart / blood pumped		**6**
	(iii)	vein		**6**
	(iv)	substances can diffuse easily/ in and out of blood / tissues/less fat content		**3**
	(v)	capillaries at both ends / joins two organs/ two named organs		**3**
	(vi)	1. renal (arteries)		**3**
		2. coronary or cardiac(arteries)		**3**
15. (a)	(i)	2		**3**
	(ii)	single or central vascular bundle (xylem)/ root hairs / endodermis		**2(3)**
	(iii)	A = ground tissue B = vascular tissue C = dermal tissue		**3(3)**
	(iv)	xylem/phloem		**2(3)**
		Xylem - lignified/ transports water/ vessels/ tracheids / dead		
		Phloem – transports food/ sieve tubes/ companion cells / living		
		any one difference		**3**
	(v)	food storage/storage of waste/ photosynthesis / strength/ support		**3**
(b)	(i)	asexual reproduction (in plants) / cloning		**6**
	(ii)	"Seed" potatoes - stem		
		Runners of strawberries etc. - stem		
		Tuber of *Dahlia* - root		
		Bulb of onion - stem/leaf/bud		
		New plants from leaf - leaf		
		Artificial examples		
		Cuttings/grafts/layers - stem, bud, stem		
		any one example		**3 + 3**
	(iii)	One parent / less variation in offspring /no pollination /no sexual reproduction		**6**
	(iv)	cutting /grafting /layering /micropropagation any two		**2(3)**
		Advantage – simple/fast/ same as parent / avoids competition		**3**
		Disadvantage – lack of variation / diseases inherited		**3**
(c)	(i)	A = Stolon / hypha B = rhizoid C = sporangium		**3(4)**
	(ii)	anchorage/ absorption / digestion/secretion of enzymes/nutrition/feeding		**3**
	(iii)	(produces) spores/ reproduction		**3**
	(iv)	heterotrophic/ saprotrophic /saprophytic /saprobic		**3**
		decomposes / recycling		**3**
	(v)	Fungi		**3**
	(vi)	yeast/mushroom/ etc …..		**3**