Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate 2012

Marking Scheme

Biology

Ordinary Level

INTRODUCTION

1. The marking scheme is a guide to awarding marks to candidates' answers. It is a concise and summarised guide and is constructed in a way to minimise its word content.
2. Examiners must conform to this scheme and may not allow marks for answering outside this scheme.
3. The scheme contains key words or phrases for which candidates may be awarded marks. This does not preclude synonyms or phrases which convey the same meaning as the answer in the marking scheme.
4. Although synonyms are generally acceptable, there may be instances where the scheme demands an exact scientific term and will not accept equivalent non-scientific or colloquial terms.
5. The scheme may include the words "any valid answer" and the examiner will use his/her professional judgement to determine the validity of the answer. If in doubt, he/she should consult with his/her advising examiner before awarding marks.
6. Where it comes to the attention of the examiner that a candidate has presented a valid answer and there is no provision in the scheme for accepting this answer, then he/she must first consult with his/her advising examiner before awarding marks.
7. A key word may be awarded marks only if it is presented in the correct context.

CANCELLED ANSWERS

The following is an extract from S63 *Instructions to examiners*

"Where a candidate answers a question or part of a question once only and then cancels his/her answer,

you should ignore the cancelling and should treat the answer as if it had been left uncancelled."

e.g. **Question**: What is pollination?

Marking Scheme: transfer of pollen/ from anther/ to stigma **3(3) marks**

Sample Answer: ~~transfer of pollen/ by insect/ to stigma~~

The candidate has cancelled the answer and has not made another attempt to answer the question and may be awarded 2(3) marks.

SURPLUS ANSWERS

In Section A a surplus wrong answer cancels the marks awarded for a correct answer.

e.g.The walls of xylem vessels are reinforced with ……

Marking Scheme Answer: lignin **4 marks**

Sample answers:

(i) chitin, lignin – there is a surplus answer, which is incorrect, so the candidate scores 4 – 4 marks = 0.

(ii) ~~lignin~~ – the answer, which is correct, has been cancelled, but there is no additional or surplus answer, therefore the candidate may be awarded 4 marks.

(iii) lignin, ~~chitin~~ - - there is a surplus answer, which is incorrect, but it has been cancelled. The candidate has given more than one answer but the cancelling can be accepted and he/she may be awarded 4 marks.

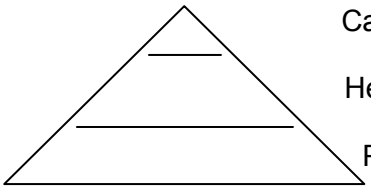
In Sections B and C, where a specific number of points is asked for, if the candidate answers by providing a list of options, the examiner will only consider the 1st one, two or three (as appropriate) even if a correct answer appears later in the list.

MARKING SCHEME CONVENTIONS

1. Each word or phrase for which marks are allocated is separated by a solidus (/) from the next word
2. The mark awarded for an answer is indicated in bold next to the answer.
3. Where there are several parts in the answer to a question, the mark awarded for each part appears in brackets e.g. **5 (4)** means that there are five parts to the answer, each part allocated 4 marks.
4. The answers to subsections of a question may not necessarily be allocated a specific mark;
   e.g. there may be six parts to a question – (a), (b), (c), (d), (e), (f) and a total of 20 marks allocated to the question. The marking scheme might be as follows – **2 (4) + 4 (3).** This means that the first two correct answers are awarded 4 marks each and each subsequent correct answer is awarded 3 marks each.
5. A word that appears in brackets is not a requirement of the answer
6. Square brackets are used where the examiner's attention is being drawn to an instruction relating to the answer or to some qualification of the answer.

			SECTION A	
1.				**2(1) + 3(2) + 2(6)**
	(a)	(i)	Tuna	
		(ii)	Crisps / "Butter" (on bread) [not 'spread']	
	(b)	(i)	B or C	
		(ii)	Bread or Sweetcorn / Apple	
	(c)		Keratin / Myosin / Collagen	
	(d)		Energy (storage) / Insulation / Cell Membranes/(Storage of fat soluble) vitamins/Protection	
	(e)		Metabolism	
2.				**2(1) + 3(2) + 2(6)**
	(a)		A = Contractile Vacuole B = Cytoplasm / Endoplasm C = Pseudopodium / False Foot D = Nucleus	
	(b)		Function "A" = Water balance / Osmoregulation Function "C" = Movement / Feeding / Egestion/ Homeostasis	
	(c)		e.g. Plant Cell has Cell Wall	
3.				**2(1) + 3(2) + 2(6)**
	(a)		F	
	(b)		T or F	
	(c)		F	
	(d)		T	
	(e)		T	
	(f)		F	
	(g)		F	
4.				**2(1) + 3(2) + 2(6)**
	(a)		Stem	
	(b)		Ground Tissue = A; Dermal Tissue = C; Vascular Tissue = B	
	(c)		Transport / Support	
	(d)	1.	Xylem	
		2.	Phloem	
5				**3(2) + 2(7)**
	(a)		Pollution	
	(b)		Smell	
	(c)		Recycle	
	(d)		Conservation	
	(e)		Burning Fuel	
6.				**2(1) + 3(2) + 2(6)**
	(a)		Possible gametes: (T) (t) X (t)	(3pts)
	(b)		Genotypes of offspring: (Tt) (tt)	(2pts)
	(c)		Phenotypes of offspring: Tall & Dwarf (allow small)	(2pts)

			SECTION B	
7.	(a)			**5 + 1**
		(i)	e.g. Asthma	**(**1 pt)
		(ii)	e.g. Use of Inhaler (must match)	(1 pt)
	(b)			**2(6)+6(2)**
			Ticking Breathing Rate/Pulse Rate	(0 pts)
		(i)	Count pulse or breaths / time or rate repeat or average	(2 pts) (1 pt)
		(ii)	Exercise / check rate	(2 pts)
		(iii)	Exercise causes increase in rate	(1 pt)
		(iv)	Yes / No	(1 pt)
		(v)	Must match (iv)	(1 pt)
8.	(a)			**5 + 1**
		(i)	A biological or organic or protein catalyst.	(1 pt)
		(ii)	Ribosome	(1 pt)
	(b)			**2(6) + 6(2)**
		(i)	e.g. Catalase	(1 pt)
		(ii)	e.g. Hydrogen peroxide (Must match enzyme)	(1 pt)
		(iii)	Waterbath	(1 pt)
		(iv)	e.g. Volume of froth / time (Depends on enzyme used)	(2 pts)
		(v)	Buffer	(1 pt)
		(vi)	Increasing activity with increasing temp / works best at certain temp / activity decreases above or below certain temp. (Can be shown by graph with one axis labelled)	(2 pts)
9.	(a)			**5+1**
		(i)	e.g. Water is a good solvent.	(1 pt)
		(ii)	e.g. Water maintains its temperature well	(1 pt)
	(b)			**2(6)+6(2)**
		(i)	Iodine (solution)	(1 pt)
		(ii)	No	(1 pt)
		(iii)	Blue/Black colour	(1 pt)
		(iv)	Water instead of starch	(1 pt)
		(v)	Biuret (solution) or named chemicals	(1 pt)
		(vi)	Blue	(1 pt)
		(vii)	No	(1 pt)
		(viii)	Purple / violet / Pink	(1 pt)

			SECTION C	
10	(a)			**3(3)**
			Fox Carnivore Rabbit Herbivore Grass Producer 	Correct shape - 3 One Ecosystem 3 Food chain 3 (3 pts)
	(b)			**2(6) + 6(2) +3(1)**
		(i)	Biotic – concerned with the activities of living things Abiotic – concerned with the non-living part of the environment	(2 pts)
		(ii)	*e.g.* • *Temperature* – thermometer • *Soil pH* – pH meter	(4 pts)
		(iii)	A = Tribolium B = Planarian C = Nematode	(3 pts)
		(iv)	e.g. 1. Grasshopper 2. Green colour	(2 pts)
	(c)			**2(6)+6(2)**
		(i)	Quantitative survey - The number of individuals present Qualitative survey – Variety of organisms present	(2 pts)
		(ii)	e.g. 1. Daisy 2. Throw quadrat / note if daisies present / random or repeat or calculate or scale up	(1 pt) (2 pts) (1pt)
		(iii)	Plants and/or animal numbers increase and /or decrease (valid examples allowed)	(2 pts)
11	(a)			**6 + 3**
		(i)	Haploid = single set of chromosomes or half the diploid number	(1 pt)
		(ii)	Chromosome = group of genes joined together or large DNA molecule	(1 pt)
	(b)			**2(5) + 3+7(2)**
		(i)	White or lack of pigment / skin or fur Pink or lack of pigment / eyes	(2 pts)
		(ii)	Only expressed in homozygous state or not dominant	(1pt)
		(iii)	Change (in the make-up) / in a gene or DNA or chromosome	(2 pts)
		(iv)	1. Change in a species (over time) or (reference to) natural selection 2. Darwin or Wallace 3. e.g. Fossils	(3 pts)
		(v)	Absence of melanin / speeds up sunburn or opposite	(2 pts)
	(c)			**2(6)+6(2)**
		(i)	Manipulation or artificial / alteration /of genes or chromosomes	3(pts)
		(ii)	Isolation / Cutting / Ligation / Transformation / Cloning / Expression (Name or explain)	(3 pts)
		(iii)	EG. Long-life tomatoes / Weedkiller-resistant crops	(2 Pts)

12	(a)			**2(3)+3(1)**
		(i)	Sexual & Asexual reproduction	(2 Pts)
		(ii)	Fusion / of gametes / to produce a zygote	(3 pts)
	(b)			**3(5) +6(2)**
		(i)	The anther or stamen	(1 pt)
		(ii)	Ovary (accept carpel)	(1 pt)
		(iii)	e.g. Wind dispersal / Animal dispersal	(2 pts)
		(iv)	To avoid competition or to avail of suitable conditions	(1 pt)
		(v)	To overcome adverse conditions	(1 pt)
		(vi)	Water / O_2 (Allow air) / suitable temperature	(3 Pts)
	(c)			**3(4) + 6(2)**
		(i)	A = Head B = Nucleus C = Tail	(3 Pts)
		(ii)	Respiration or to produce energy	(1 pt)
		(iii)	Testosterone	(1 pt)
		(iv)	e.g. Low sperm counts	(1 pt)
		(v)	Prevention of fertilisation or prevention of pregnancy	(1 pt)
		(vi)	e.g. Natural / Mechanical or examples	(2 pts)
13	(a)			**7 + 2(1)**
		(i)	e.g. Identification	(1 pt)
		(ii)	Monera	(1 pt)
		(iii)	e.g. Food Production	(1 pt)
	(b)	(i)		**D. 5,2,0 L.2(1)**
			Diagram to include: Cell Memb/Cytoplasm + one other. <u>Labels:</u> Any two valid labels	<u>Diagram:</u> All three = 5 One absent = 2 Two absent = 0
		ii-v		**2(6) + 4(2)**
		(ii)	Bacillus or rod shaped / Coccus or spherical (Round) / Spirillum or spiral shaped	(2 pts)
		(iii)	Binary Fission or asexual [Not Mitosis]	(1 pt)
		(iv)	Disease-causing	(1 pt)
		(v)	Temp / O_2 (allow air)/ water/ food /pH / Waste	(2 pts)
	(c)			**2(7) +5(2)**
		(i)	A = Stolon or Hypha; B = Rhizoid	(2 pts)
		(ii)	Anchor / absorb / secretes enzymes	(2 Pts)
		(iii)	(Release or production of) spores	(1 pt)
		(iv)	Living on dead matter	(1 pt)
		(v)	e.g. Antibiotic Production	(1 pt)

14.	(a)			**2(5)+2(4)+4(1)**
		(i)	Breakdown of food or production of energy / in presence of O_2	(2 pts)
		(ii)	1. Cytoplasm 2. Mitochondria	(2 pts)
		(iii)	Aerobic (Respiration)	(1 pt)
		(iv)		**D. 5,2,0 L. 3(1)**
			Diagram must include: • Container • Liquid • Oil or Airlock Labels required: • Glucose • Yeast • Oil or Airlock	Diagram: All three = 5 One absent = 2 Two absent = 0
			1. CO_2 2. Bubbles 3. Bubbling stops	(3 pts)
14.	(b)			**2(5)+2(3)+7(2)**
		(i)	Chlorophyll	(1 pt)
		(ii)	(Movement of) H_2O / through semi-permeable memb / from low to high conc (or high to low water conc)	(3 pts)
		(iii)	1. O_2 / H^+ / e^- 2. Light Stage	(3 pts) (1 pt)
		(iv)	Stoma	(1 pt)
		(v)	e.g. extra CO_2 / more light	(2 Pts)
14.	(c)			**2(5) + 2(4) + 5(1)**
		(i)	Group of cells / with a common function	(2 Pts)
		(ii)	Oxygen	(1 pt)
		(iii)	To avoid contamination	(1 pt)
		(iv)	Mitosis	(1 pt)
		(v)	Cancer	(1 pt)
		(vi)	e.g. Radiation / smoking	(2 pts)
		(vii)		**D. 5,2,0 L. 2(1)**
			Diagram to include: • Cycle • Proportionality Two correct = 5 marks One Correct = 2 marks None = 0 marks	Labels: Any two correct labels
		(viii)	Reduction (halving) of Chromosome numbers or to produce gametes (Allow reduction division)	(1pt)

15.				**2(5)+2(4)+6(2)**
	(a)	(i)	A = Hair B = Sweat gland C = Blood vessels	(3 pts)
		(ii)	e.g. Sweat	(1 pt)
		(iii)	e.g. Protection / Melanin production	(2 pts)
		(iv)	e.g. Kidney / Urine	(2 pts)
		(v)	Maintaining constant internal conditions	(1 pt)
		(vi)	Produces heat (internally) or warm blooded	(1 pt)
15.	(b)			**2(5)+2(3)+7(2)**
	(i)	1	Phototropism	(1 pt)
		2	e.g. Auxin	(1 pt)
		3	Growing tip or apical meristem	(1 pt)
		4	e.g. Sting	(1 pt)
	(ii)	1	Brain & Spinal Cord	(2 pts)
		2	Motor Neuron / Sensory Neuron/ Interneuron	(2 Pts)
		3	Synapse	(1 pt)
		4	(Neuro) Transmitter	(1 pt)
		5	Destroyed or reused	(1 pt)
15.	(c)			**2(5)+2(4)+6(2)**
		(i)	A = Duodenum or Small Intestine B = Colon or Large Intestine C = Stomach	(3 pts)
		(ii)	Molecules or food broken down	(1 pt)
		(iii)	e.g. Incisor / to cut	(2 pts)
		(iv)	e.g. Kills bacteria	(1 pt)
		(v)	e.g. Bile	(1 pt)
		(vi)	Produces enzymes or named enzyme / Produces Insulin	(1 pt) (1 pt)