Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate 2014

Marking Scheme

Biology

Ordinary Level

Note to teachers and students on the use of published marking schemes

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

Future Marking Schemes

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.

INTRODUCTION

1. The marking scheme is a guide to awarding marks to candidates' answers. It is a concise and summarised guide and is constructed so as to minimise its word content.
2. Examiners must conform to the scheme, as qualified by the following points, and may not award marks for answering outside this scheme.
3. The scheme contains key words or phrases for which candidates may be awarded marks. This does not usually 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 equivalent non-scientific or colloquial terms are not acceptable.
5. In relation to particular answers, the scheme may include the words "any valid answer" and examiners will use their professional judgement to determine the validity of the answer. If in doubt, examiners should consult with their advising examiner before awarding marks.
6. A key word or phrase may be awarded marks only if it is presented in the correct context.
7. Where it comes to the attention of an examiner that a candidate has presented a valid answer and there is no provision in the scheme for accepting this answer, then the examiner must first consult with his/ her advising examiner before awarding marks.

CANCELLED ANSWERS

The following is an extract from S63 *Instructions to Examiners 2014,7.3, p.22.*

"Where a candidate answers a question or part of a question once only and then cancels the answer, you should ignore the cancelling and should treat the answer as if the candidate had not cancelled it."

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. *Question:* The walls of xylem vessels are reinforced with ……

Marking Scheme: 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.

(iv) ~~lignin~~, chitin – the correct answer has been cancelled and replaced with an incorrect one, so no marks are awarded.

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

MARKING SCHEME CONVENTIONS

1. Words or phrases for which marks are to be awarded are separated by a solidus (/).
2. The mark allocated to 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.
5. A word, term or phrase that appears in brackets is not a requirement of the answer and is given to contextualise the answer.
6. In Section C, do not read anything a candidate may have written on the question paper unless the candidate, in the answer book, makes specific reference to a particular part of a question having been answered where the question appears on the question paper.
7. 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
Answer any five questions

1				**2(7)+3(2)**
	(a)		Fish	
	(b)		Growth or repair or (to make) enzymes or hormones or antibodies or any named example of these.	
	(c)		Iodine	
	(d)		Blue-black	
	(e)		Solvent or transport or medium for reactions or reactant.	
	(f)		Obesity or high blood pressure or constipation (low fibre) or vitamin deficiency or mineral deficiency or high cholesterol or clogged arteries.	
2				**6(3) +2**
	(a)		TRUE	
	(b)		TRUE	
	(c)		FALSE	
	(d)		TRUE	
	(e)		FALSE	
	(f)		TRUE	
	(g)		TRUE	
3				**6(3) +2**
	(a)		A = Vagina B = Womb or Uterus C = Ovary D = Fallopian Tube or Oviduct	
	(b)		Produce eggs or hormones (oestrogen, progesterone)	
	(c)		Blockage of Fallopian tubes or hormonal or failure to ovulate or excessive exercise.	
	(d)		Womb or uterus or endometrium / lining of womb or uterus or ‘E’	
4				**5(4)**
	(a)		Leaf	
	(b)		*In vitro* growth	
	(c)		Organ	
	(d)		Skin graft	
	(e)		Dermal	
5				**6(3)+2**
	(a)		Rod = B Cocci = C Spiral = A	
	(b)		Binary fission	
	(c)		Movement	
	(d)		e.g. Diseases or food decay or named disease	
	(e)		e.g. Yoghurt or cheese or antibiotic production	

6				**4(3) + [3+3(1)] + 2**
	(a)		(Study of relationship between) organisms & their environment	
	(b)	**(i)**	Fox	
		(ii)	Grass	
		(iii)	Rabbit	
		(iv)	Correct diagram shape + named organisms [*each level = 1pt*]	**[3 + 3(1)]**
		(v)	e.g. Number would increase	
			SECTION B **Answer any 2 questions**	
7				
	(a)			**5 + 1**
		(i)	Two cotyledons or two seed leaves (in each seed)	
		(ii)	Transport or transport example or support	
	(b)			**6(3)+[3+(3(1)]**
		(i)	Name of plant [*do not accept* a mature tree]	
		(ii)	Easier to cut	
		(iii)	(Cut) a thin slice / place, in water or stain, on slide	2 pts
		(iv)	Turn on light or mirror / low power lens or coarse focus	2 pts
		(v)	Diagram (circle or sector with bundle) + 3 labels	[3+3(1)]
8				
	(a)			**5 + 1**
		(i)	Breakdown of food	
		(ii)	Starch	
	(b)			**8(3)**
		(i)	Starch (agar) or milk (agar)	
		(ii)	Boiled	
		(iii)	To kill the seeds or destroy enzymes or act as control	
		(iv)	Sterilised (seeds) / facedown on agar	2 pts
			Add iodine or biuret solution to plate	
		(v)	1. The plate turns blue-black or purple except where the seeds were lying or it was clear under the seeds	
			1. Clear patches in the agar under the seeds	
			2. the agar turned blue-black or purple	
			2. Treated (boiled) seeds left agar unchanged (blue-black / purple)	

9				
	(a)			**5 + 1**
		(i)	Prevent backflow (of blood)	
		(ii)	Septum	
	(b)			**6(3) +[3+3(1)]**
		(i)	Left side firmer or thicker	
		(ii)	Scalpel [*Accept* scissors]	
		(iii)	Cut / left side / right side	3 pts
		(iv)	Semi-lunar valves	
		(v)	Diagram and 3 named labels	[3+3(1)]
			SECTION C **Answer any 4 questions**	
10				
	(a)			**7 + 2(1)**
		(i)	Alleles are different	
		(ii)	Controls sex of organism	
		(iii)	Two sets of chromosomes or chromosomes in pairs	
	(b)			**9(3)**
		(i)	Parents: bb and Bb	2 pts
		(ii)	Gametes: (b) (B) (b)	3 pts
		(iii)	Offspring genotypes: Bb bb	2 pts
			Matching phenotypes: black white	2 pts
	(c)			**8(3)**
		(i)	Chromosome	
		(ii)	1. Two	
			2. Meiosis	
		(iii)	1. Reproduction	
			2. Named single - celled organism	
		(iv)	Gene or chromosome or DNA	
		(v)	Checking or testing (DNA) / for a gene	2 pts

11				
	(a)			**7 + 2(1)**
		(i)	*Abiotic:* non-living (factors)	
		(ii)	*Edaphic:* (relating to) soil	
		(iii)	*Habitat:* where an organism lives	
	(b)			**9(3)**
		(i)	South Africa or Namibia	
		(ii)	Dry, open plains or scrubland / network of burrows	
		(iii)	Kills / prey or kill / to eat or kills/ for food	2 pts
		(iv)	They eat animals and plant or fungus	
		(v)	Scorpion	
		(vi)	Plants and animals and fungi	
		(vii)	Looks alert, upright (posture) or large ears or large nose or large eyes	2 pts
	(c)			**8(3)**
		(i)	Any two problems e.g. smell, unsightly, vermin, disease, pollution, illegal dumping	2 pts
		(ii)	reduce or reuse or recycle - any two	2 pts
		(iii)	Counting / numbers / how many	
		(iv)	Quadrat / random or how achieved /count / number of times	3 pts
12				
	(a)			**7 + 2(1)**
		(i)	Light or water or gravity or touch or chemicals or temperature	2 pts
		(ii)	Growth towards (or away from) stimulus e.g. phototropism	
	(b)			**9(3)**
		(i)	A = Brain B = Spinal cord [*Accept* spine]	2 pts
		(ii)	Sensory / motor / inter (relay)	2 pts
		(iii)	1. Synaptic cleft [*Accept* synapse]. 2. Neurotransmitter(s) or named neurotransmitter	2 pts
		(iv)	1. *Named disorder:* e.g. Parkinson's	
			2. *Cause:* lack of dopamine	
			3. *Treatment:* drugs	
	(c)			**8(3)**
		(i)	Excessive level of body fat [*Accept* high BMI]	
		(ii)	Ductless or not having tube(s)	
		(iii)	Abdomen or under the stomach or near duodenum	
		(iv)	In the blood on in the lymph.	
		(v)	1. Lack of insulin or insulin not functioning or genetics [*Accept* causes listed in introduction to question].	
			2. e.g. Thirst, fatigue, high or low blood sugar levels	2 pts
			3. e.g. Insulin injections / dietary management / exercise	

13				
	(a)			**7 + 2(1)**
		(i)	1. *Photosynthesis:* anabolism	
			2. *Respiration:* catabolism	
		(ii)	Light or sunlight	
	(b)			**9(3)**
		(i)	Chlorophyll	
		(ii)	Chloroplast	
		(iii)	Stoma(ta)	
		(iv)	Carbon dioxide [*Accept* water vapour]	
		(v)	Protons (hydrogen ions) / electrons / oxygen	3 pts
		(vi)	More light (intensity or hours) / more carbon dioxide / more heat	2 pts
	(c)			**8(3)**
		(i)	(Release of) energy / from food	2 pts
		(ii)	Aerobic / anaerobic	2 pts
		(iii)	Anaerobic [*Accept* aerobic]	
		(iv)	Little (lot) [*parts iv, v & vi must match part (iii)*]	
		(v)	Lactic if anaerobic (pyruvic if aerobic)	
		(vi)	Broken down or diffuses away or turns to fat (respired aerobically)	

14				
	(a)			**10(3)**
		(i)	A = Biceps B = Triceps	2 pts
		(ii)	The two work in opposition to each other	
		(ii)	Tendons	
		(iv)	Biceps contracts / triceps relaxes	2 pts
		(v)	Joints	
		(vi)	1. Named disorder	
			2. Cause	
			3. Treatment	
	(b)			**10(3)**
		(i)	Pathogen	
		(ii)	e.g. Skin or cilia or stomach acid or tears or white blood cells or blood clotting	2 pts
		(iii)	1. *Active immunity:* (body) produces antibodies *Passive immunity:* antibodies given or administered (produced by another organism). 2. Active	3 pts
		(iv)	Two disease examples	2 pts
		(v)	Non-disease causing dose / of a pathogen	2 pts
	(c)			**10(3)**
		(i)	A = Penis B = Urethra C = Sperm duct or Vas deferens	3 pts
		(ii)	Testosterone or FSH or LH	
		(iii)	Release liquid or nourish or support sperm	
		(iv)	Sperm production better if cooler	
		(v)	D or testes	
		(vi)	Prevention of pregnancy	
		(vii)	*Two methods:* barrier (or named e.g. condom) / (contraceptive) pill / surgical (or named e.g. vasectomy) / abstain	2 pts

15				
	(a)			**10(3)**
		(i)	A = Retina B = Lens	2 pts
		(ii)	*Name:* iris *Function:* control amount of light entering eye	2 pts
		(iii)	Give shape to eye or support lens or transmits light	
		(iv)	Light through cornea / pupil / lens / accommodation / focus / onto retina / rods / cones / nerve impulse / optic nerve	5 pts
	(b)			**10(3)**
		(i)	Oxygen	
		(ii)	Diaphragm / intercostal (rib) muscles	2 pts
		(iii)	Intercostal muscles contract / to move ribcage up and out / diaphragm contracts or moves downward / lung (volume) increases / pressure decreases / air moves in	4 pts
		(iv)	1. Named disorder	
			2. Cause	
			3. Treatment	
	(c)			**10(3)**
		(i)	1. Red colour	
			2. Prevent evaporation	
		(ii)	Root hairs	
		(iii)	Osmosis	
		(iv)	Loss of water (vapour) through leaves of plant	
		(v)	1. Chemicals that control growth (in plants)	
			2. Two examples (within the plant or as commercial uses)	2 pts
		(vi)	*Two adaptations:* e.g. waxy layer or opening and closing of stomata or thorns or stings	2pts