2017 HKDSE

Biology and Combined Science (Biology)

Exam Analysis

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1 Coverage

a Most topics in the curriculum are covered. More marks are allocated to the chapters below:

Ch 2 The cell as the basic unit of life (8 marks; CS 7 marks)

Ch 8 Transport in humans (12 marks; CS 11 marks)

Ch 20 Ecosystems (15 marks; CS 13 marks)*

✂ **Ch 21** Photosynthesis (10 marks)*

✂ **Ch 25** Body defence mechanisms (9 marks)

Ch 26 Basic genetics (14 marks; CS 14 marks)*

[* Also hot topics in 2016 HKDSE papers]

b Relationship between Biology and Combined Science:

i In Combined Science Section A, all the multiple-choice questions are common with Biology Paper 1A.

ii In Combined Science Section B, Q1, 2, 4, 5 and 7 are common with Biology Paper 1B. Q3 and 6 are slightly different from Q4 and 6 in Biology Paper 1B respectively.

2 Level of difficulty

a The multiple-choice questions in 2017 HKDSE papers are in general easier than those in 2016 HKDSE papers. In Biology Paper 1A, Q4, 11, 12, 13, 14, 18 and 21 (CS A Q4, 7 and 8) are more challenging and may be set to differentiate students of different abilities.

b The conventional questions in 2017 HKDSE papers are in general easier than those in 2016 HKDSE papers. In Biology Paper 1B, Q4b, 5b, 6b, 8d, 10b and 10d (CS B Q2b, 3b, 4d, 5b, 5d and 6b) are more challenging and may be set to differentiate students of different abilities.

c In Biology Paper 2, Q2a, 2b, 4a and 4b are comparatively more difficult.

3 Skills or abilities assessed

The papers assess different types of skills and abilities. They are shown in the table below.

		Biology Paper 1A (CS Section A)	Biology Paper 1B (CS Section B)
a	**Skills related to SBA**		
	i Making observations	Q16, 21 and 23 (Q10 and 15)	Q4 (Q3)
	ii Designing experiments		
	• Designing fair tests	-	Q7b and 10c i (Q5c i)
	• Setting up controls	Q4 (Q4)	-
	• Making assumptions	-	Q7a
	• Ensuring reliability of results and validity of conclusions	Q14 (Q8)	-
	iii Interpreting data or graphs	Q12 and 24 (Q7)	Q8, 9b, 9c, 9d i, 10a ii, 10b and 10c (Q4, 5a ii, 5b and 5c)
	iv Interpreting photomicrographs or electron micrographs	Q21 and 23 (Q15): Embryos in different stages of development	Q4 (Q3): Pancreatic cell
	v Drawing conclusions	Q8 (Q6)	Q10a ii, 10b and 10c ii (Q5a ii, 5b and 5c ii)
b	**Understanding of the nature of science (NOS)**	-	Q6b and 10d (Q5d and 6b): Total 7 marks
c	**Applying knowledge in unfamiliar situations**	-	Q8 (Q4)
d	**Communication**	-	Q3b, 4c, 5a, 7c, 9b and 11 (Q2a, 3c and 7)

4 Challenging questions

Some questions in the papers are challenging. The table below lists the difficulties students may encounter when answering these questions. Suggestions for developing the necessary skills and abilities to address similar questions are also listed below.

Question	Difficulty	Suggestion
Biology Paper 1A Q4 (CS A Q4) - An investigation of the action of a starch-digesting enzyme	Students may not know the purposes of setting up different test tubes. They may not be able to choose the correct answer.	Students should expose to a wider range of experiments and try to explain the purposes of different experimental and control set-ups.
Biology Paper 1B Q6b (CS B Q6b) - Contribution of technology advancements to the development of different classification systems Biology Paper 1B Q10d ii (CS B Q5d ii) - Development of knowledge about the inheritance of the tongue rolling trait	Students often find answering questions set on NOS difficult. They may not be able to apply what they have learnt to address the questions. They may also have difficulty in explaining how the historical events can demonstrate certain aspects of NOS.	Students can promote the understanding of NOS through reviewing the history of biology and discussing biological concepts.

Question	Difficulty	Suggestion
Biology Paper 1B Q8d (CS B Q4d) - Impact of global warming and foreign species on the native plant community	Students may not be able to integrate the information provided in different parts of the questions to make deduction.	Students should practise more to develop skills for answering this type of questions.
Biology Paper 2 Q2a iii - Comparison of the biomass at sites within and outside a marine protected area	Students may have difficulty in identifying the limitations of the study. They may not be able to suggest the measurements that should be taken to increase the validity of the study.	Students should expose to a wider range of experiments and discuss the reliability of the results and the validity of the conclusions with reference to the limitations of the experiments.
Biology Paper 2 Q2b iii - Effect of increased seawater temperature on the health of corals	Students are usually weak in comparing data presented in graphs. It may be difficult for them to relate the study to real-life problem.	Strengthen the training on how to compare data and the language used in comparison. Students should expose to more different experiments so that they are more familiar with comparing results.
Biology Paper 2 Q4b - Insertion of a gene of interest into a plasmid and selection of transformed bacteria	Students may have difficulty in applying what they have learnt to work out this method of selection of transformed bacteria.	Students should read questions carefully to understand the situation. They should also expose to a wider variety of questions set on unfamiliar situations may help them to develop the required skills.

5 Exam trend

Compulsory part

= equivalent

~ similar to

Chapter	2012	2013	2014	2015	2016	2017
Ch 1 Introducing biology						
Ch 2 The cell as the basic unit of life		MC BIO IA Q3 = CS A Q3	MC BIO IA Q3 ~ CS A Q1 MC BIO IA Q5 ~ CS A Q2	MC BIO IA Q1 = CS A Q1	MC BIO IA Q12 = CS A Q8	BIO IB Q4 ~ CS B Q3
Ch 3 Movement of substances across cell membrane		MC BIO IA Q5 = CS A Q5 MC BIO IA Q23 = CS A Q9 MC BIO IA Q24 = CS A Q10 MC BIO IA Q25 = CS A Q11	BIO IB Q7 = CS B Q6	MC BIO IA Q2 = CS A Q2 BIO IB Q6 = CS B Q5	MC BIO IA Q1 = CS A Q1 MC BIO IA Q24 = CS A Q18 MC BIO IA Q25 = CS A Q19	BIO IB Q2 = CS B Q1
Ch 4 Enzymes and metabolism		MC BIO IA Q6 = CS A Q6 MC BIO IA Q7 = CS A Q7	MC BIO IA Q9 = CS A Q3	MC BIO IA Q3 = CS A Q3 BIO IB Q7 = CS B Q6	MC BIO IA Q8 MC BIO IA Q27 = CS A Q4	MC BIO IA Q4 = CS A Q4 MC BIO IA Q5 = CS A Q5
Ch 5 Food and humans					MC BIO IA Q3 = CS A Q3 MC BIO IA Q5 = CS A Q5 MC BIO IA Q6 = CS A Q6	MC BIO IA Q3 = CS A Q3
Ch 6 Nutrition in humans	MC BIO IA Q1 = CS A Q1 MC BIO IA Q20 = CS A Q6 MC BIO IA Q34 = CS A Q7 BIO IB Q10	MC BIO IA Q26 = CS A Q18 BIO IB Q3 = CS B Q2	MC BIO IA Q1 MC BIO IA Q24 = CS A Q15 MC BIO IA Q25 = CS A Q16 MC BIO IA Q26 = CS A Q17 BIO IB Q11 = CS B Q8	MC BIO IA Q7 = CS A Q5 MC BIO IA Q8 = CS A Q6 MC BIO IA Q9 = CS A Q7 MC BIO IA Q10 = CS A Q8	MC BIO IA Q2 = CS A Q2 MC BIO IA Q7	MC BIO IA Q1 = CS A Q1 MC BIO IA Q2 = CS A Q2
Ch 7 Gas exchange in humans	MC BIO IA Q22 = CS A Q17	MC BIO IA Q1 = CS A Q1 MC BIO IA Q30 = CS A Q20	MC BIO IA Q27 = CS A Q18 BIO IB Q2 = CS B Q1	MC BIO IA Q13 = CS A Q10 MC BIO IA Q15 = CS A Q12	BIO IB Q11 = CS B Q9	BIO IB Q5 = CS B Q2

Chapter	2012	2013	2014	2015	2016	2017
Ch 8 Transport in humans	MC BIO IA Q21 = CS A Q16 MC BIO IA Q31 = CS A Q23 MC BIO IA Q32 = CS A Q24 MC BIO IA Q33 = CS A Q5 BIO IB Q1 ~ CS B Q1	MC BIO IA Q31		MC BIO IA Q14 = CS A Q11 BIO IB Q11 = CS B Q9	MC BIO IA Q13 = CS A Q9 MC BIO IA Q16 MC BIO IA Q17 MC BIO IA Q28 = CS A Q21 MC BIO IA Q29 = CS A Q22	MC BIO IA Q18 BIO IB Q11 = CS B Q7
Ch 9 Nutrition and gas exchange in plants	BIO IB Q5 = CS B Q5		MC BIO IA Q6 MC BIO IA Q7 MC BIO IA Q8		BIO IB Q9 ~ CS B Q7	
Ch 10 Transpiration, transport and support in plants	MC BIO IA Q3 = CS A Q2 MC BIO IA Q10 = CS A Q11 MC BIO IA Q11 = CS A Q12 MC BIO IA Q12 = CS A Q10 BIO IB Q3 = CS B Q3	BIO IB Q6 ~ CS B Q4	MC BIO IA Q20 = CS A Q11 MC BIO IA Q21 = CS A Q12 MC BIO IA Q22 = CS A Q13 MC BIO IA Q23 = CS A Q14 BIO IB Q4 = CS B Q3	MC BIO IA Q17 = CS A Q13 MC BIO IA Q18 = CS A Q14 BIO IB Q9 ~ CS B Q8	MC BIO IA Q11 = CS A Q7 MC BIO IA Q21 MC BIO IA Q22 = CS A Q15 MC BIO IA Q23 = CS A Q16	MC BIO IA Q13 MC BIO IA Q14 = CS A Q8 MC BIO IA Q15 = CS A Q9 MC BIO IA Q16 = CS A Q10 MC BIO IA Q17 = CS A Q11
Ch 11 Cell cycle and division	BIO IB Q11 = CS B Q8	MC BIO IA Q14 = CS A Q13 MC BIO IA Q18 = CS A Q17	BIO IB Q3 ~ CS B Q2	BIO IB Q2 ~ CS B Q2	MC BIO IA Q18 = CS A Q12 MC BIO IA Q19 = CS A Q13 MC BIO IA Q20 = CS A Q14	MC BIO IA Q22 = CS A Q14
✂ **Ch 12** Reproduction in flowering plants	MC BIO IA Q24		MC BIO IA Q4 BIO IB Q8	MC BIO IA Q19 MC BIO IA Q24 MC BIO IA Q25	MC BIO IA Q31 MC BIO IA Q32	BIO IB Q3
Ch 13 Reproduction in humans	MC BIO IA Q25 = CS A Q18 MC BIO IA Q26 = CS A Q19 MC BIO IA Q27 = CS A Q20 MC BIO IA Q28 MC BIO IA Q29 = CS A Q21	MC BIO IA Q35 = CS A Q23 MC BIO IA Q36 = CS A Q24	MC BIO IA Q28 = CS A Q19 MC BIO IA Q29 = CS A Q20	MC CS A Q22	BIO IB Q2 ~ CS B Q2	MC BIO IA Q19 = CS A Q12 MC BIO IA Q20 = CS A Q13 MC BIO IA Q23 = CS A Q15

Chapter	2012	2013	2014	2015	2016	2017
✂ **Ch 14** Growth and development				MC BIO IA Q28		MC BIO IA Q21 MC BIO IA Q24
Ch 15 Detecting the environment	MC BIO IA Q8 = CS A Q8 MC BIO IA Q9 = CS A Q9 MC BIO IA Q30 = CS A Q22	MC BIO IA Q27 MC BIO IA Q28 MC BIO IA Q29 = CS A Q19 BIO IB Q7 = CS B Q5	MC BIO IA Q36 = CS A Q24	MC BIO IA Q27 = CS A Q17 MC BIO IA Q29 = CS A Q18 BIO IB Q1 = CS B Q1	MC BIO IA Q35 = CS A Q23 MC BIO IA Q36 = CS A Q24	MC BIO IA Q25 = CS A Q18 MC BIO IA Q26 = CS A Q19 MC BIO IA Q27 = CS A Q16 MC BIO IA Q28 = CS A Q17 MC BIO IA Q31 = CS A Q24
Ch 16 Coordination in humans	MC BIO IA Q4 = CS A Q3 MC BIO IA Q6 = CS A Q4	BIO IB Q1 = CS B Q1	MC BIO IA Q2 BIO IB Q10 ~ CS B Q5	MC BIO IA Q22 = CS A Q15 MC BIO IA Q23 = CS A Q16	BIO IB Q1 = CS B Q1	MC BIO IA Q29 = CS A Q20 MC BIO IA Q30 = CS A Q21
✂ **Ch 17** Movement in humans	MC BIO IA Q5 MC BIO IA Q7	BIO IB Q2	MC BIO IA Q34 MC BIO IA Q35	MC BIO IA Q20 MC BIO IA Q21 BIO IB Q5	MC BIO IA Q33 = CS A Q20	BIO IB Q1
Ch 18 Homeostasis		MC BIO IA Q2 = CS A Q2 MC BIO IA Q33 = CS A Q21 MC BIO IA Q34 = CS A Q22				
Ch 19 Biodiversity	BIO IB Q4 = CS B Q4	MC BIO IA Q21	MC BIO IA Q15	MC BIO IA Q5 ~ CS A Q4	MC BIO IA Q15 = CS A Q11 BIO IB Q4 ~ CS B Q4	BIO IB Q6 ~ CS B Q6
Ch 20 Ecosystems	MC BIO IA Q13 MC BIO IA Q14 MC BIO IA Q16 = CS A Q14 MC BIO IA Q17 = CS A Q15 BIO IB Q6 = CS B Q7	BIO IB Q5 BIO IB Q8 = CS B Q6	MC BIO IA Q30 = CS A Q21 MC BIO IA Q31 = CS A Q22 MC BIO IA Q33 = CS A Q23 BIO IB Q5	MC BIO IA Q30 = CS A Q23 MC BIO IA Q31 = CS A Q24 BIO IB Q3 = CS B Q3	MC BIO IA Q30 = CS A Q17 MC BIO IA Q34 BIO IB Q5 ~ CS B Q3	MC BIO IA Q12 = CS A Q7 MC BIO IA Q32 MC BIO IA Q33 MC BIO IA Q34 = CS A Q22 MC BIO IA Q35 = CS A Q23 BIO IB Q8 = CS B Q4

Chapter	2012	2013	2014	2015	2016	2017
✂ **Ch 21** Photosynthesis	MC BIO IA Q2 MC BIO IA Q23	MC BIO IA Q8 MC BIO IA Q9 (deleted)		MC BIO IA Q4 MC BIO IA Q11 MC BIO IA Q12	MC BIO IA Q9 MC BIO IA Q10 BIO IB Q3	MC BIO IA Q6 BIO IB Q7
✂ **Ch 22** Respiration	BIO IB Q9	MC BIO IA Q10	MC BIO IA Q14 BIO IB Q1	MC BIO IA Q6	MC BIO IA Q26	MC BIO IA Q7
Ch 23 Infectious diseases	BIO IB Q2 = CS B Q2			MC BIO IA Q33 = CS A Q21		
✂ **Ch 24** Non-infectious diseases and disease prevention	BIO IB Q7		BIO IB Q9 = CS B Q7	MC BIO IA Q34 = CS A Q19 MC BIO IA Q35 = CS A Q20 BIO IB Q8	BIO IB Q6	MC BIO IA Q36
✂ **Ch 25** Body defence mechanisms	MC BIO IA Q35 MC BIO IA Q36	MC BIO IA Q32 BIO IB Q9	MC BIO IA Q32	MC BIO IA Q32 MC BIO IA Q36	BIO IB Q7 ~ CS B Q5	BIO IB Q9
Ch 26 Basic genetics	MC BIO IA Q15 = CS A Q13 BIO IB Q8 = CS B Q6	MC BIO IA Q4 = CS A Q4 MC BIO IA Q12 = CS A Q8 MC BIO IA Q13 = CS A Q12 MC BIO IA Q15 = CS A Q14 MC BIO IA Q16 = CS A Q15 MC BIO IA Q17 = CS A Q16 BIO IB Q4 ~ CS B Q3 BIO IB Q10 = CS B Q7	MC BIO IA Q10 = CS A Q4 MC BIO IA Q11 = CS A Q5 MC BIO IA Q12 = CS A Q6 MC BIO IA Q13 = CS A Q7 CS B Q4	MC BIO IA Q16 = CS A Q9 MC BIO IA Q26 BIO IB Q4 ~ CS B Q4	MC BIO IA Q4 BIO IB Q8 ~ CS B Q6 BIO IB Q10 ~ CS B Q8	MC BIO IA Q8 = CS A Q6 BIO IB Q10 = CS B Q5
✂ **Ch 27** Molecular genetics	MC BIO IA Q18 MC BIO IA Q19	MC BIO IA Q11	MC BIO IA Q16			MC BIO IA Q9

Chapter	2012	2013	2014	2015	2016	2017
Ch 28 Biotechnology			MC BIO IA Q19 = CS A Q10			
Ch 29 Evolution I		MC BIO IA Q19 MC BIO IA Q20	MC BIO IA Q17 = CS A Q8 MC BIO IA Q18 = CS A Q9	BIO IB Q10 ~ CS B Q7	MC BIO IA Q14 = CS A Q10	
✂ **Ch 30** Evolution II		MC BIO IA Q22	BIO IB Q6			MC BIO IA Q10 MC BIO IA Q11

Elective part

Chapter	2012	2013	2014	2015	2016	2017
✂ **E1 Human Physiology: Regulation and Control**						
Ch 1 Regulation of water content	BIO II Q1a, b(i)		BIO II Q1a		BIO II Q1b	BIO II Q1b
Ch 2 Regulation of body temperature	BIO II Q1b(ii)			BIO II Q1b(iii)		BIO II Q1a(iii)
Ch 3 Regulation of gas content in blood	BIO II Q1b(iii)	BIO II Q1a	BIO II Q1b	BIO II Q1b(i), (ii)	BIO II Q1a	BIO II Q1a(i), (ii)
Ch 4 Hormonal control of reproductive cycle		BIO II Q1b		BIO II Q1a		
✂ **E2 Applied Ecology**						
Ch 1 Human impact on the environment	BIO II Q2a	BIO II Q2a, b	BIO II Q2a, b(ii)	BIO II Q2a, b	BIO II Q2a, b	BIO II Q2a(i), b
Ch 2 Human responsibilities for the environment	BIO II Q2b		BIO II Q2b(i), (iii)			BIO II Q2a(ii)-(iv)

Chapter	2012	2013	2014	2015	2016	2017
✂ **E3 Microorganisms and Humans**						
Ch 1 Basic microbiology	BIO II Q3a(i)-(iv), b	BIO II Q3b(i)	BIO II Q3a	BIO II Q3a, b	BIO II Q3a(iii)	BIO II Q3b(iii)
Ch 2 Use of microorganisms		BIO II Q3a, b(ii)	BIO II Q3b(i), (ii)(2)		BIO II Q3b	BIO II Q3a
Ch 3 Harmful effects of microorganisms	BIO II Q3a(v)	BIO II Q3b(iii)	BIO II Q3b(ii)(1)		BIO II Q3a(i), (ii), (iv)	BIO II Q3b(i), (ii)
✂ **E4 Biotechnology**						
Ch 1 Techniques in modern biotechnology	BIO II Q4a	BIO II Q4a(i)-(iii), b	BIO II Q4a(i), (ii)(1), b	BIO II Q4b	BIO II Q4b	BIO II Q4a(ii)-(iii), b
Ch 2 Applications in biotechnology	BIO II Q4b(i), (iii)(1), (2)			BIO II Q4a	BIO II Q4a(i)-(iii)	BIO II Q4a(i)
Ch 3 Bioethics	BIO II Q4b(ii), (iii)(3)	BIO II Q4a(iv)	BIO II Q4a, b(ii)(2)		BIO II Q4a(iv)	BIO II Q4a(iv)

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