GrindSpot
ONLINE GRINDS PLATFORM

LEAVING CERT 2027

LEAVING CERT BIOLOGY

Exam Ready

Higher Level · New course · Workbook A

Dyslexia friendly
large, clear text · room to write

Built on the new Leaving Cert Biology course and the SEC sample papers, with 9 years of past papers: what comes up, how it's marked, and the practice to nail it.

- **9** years of exam trends, topic by topic
- **60** topic drills with answers
- **1** full practice paper, 300 marks
- ✓ every answer worked out step by step



Know what's coming.
Walk in ready.

Original GrindSpot material written in the style of the Leaving Certificate examination. Not an official SEC paper.

What comes up

2017 to 2026

All 147 questions of the old-course Higher Level papers, 2017–2026 (no exam in 2020): a guide to what biology examiners like to ask. Gone from the new course: the eye and the ear, tropisms and the IAA experiment, the lymphatic system, vegetative propagation and the germination experiments. We counted a topic for a question when at least one of its parts could not be answered without it.

	2017	2018	2019	2021	2022	2023	2024	2025	2026	Years
Cells, microscopy & membranes	2	2	4	3	5	2	1	2	3	9/9
Plant structure & responses	2	2	3	3	4	3	2	2	3	9/9
Biomolecules & food	1	3	3	3	2	2	2	2	3	9/9
Microorganisms & classification	2	3	2	2	3	3	2	3	1	9/9
Ecology	3	2	1	2	2	3	1	2	2	9/9
DNA & protein synthesis	2	1	2	1	2	2	2	1	3	9/9
Plant reproduction	3	1	1	1	2	2	3	1	1	9/9
Enzymes	2	1	1	2	1	1	2	2	1	9/9
Heart, blood & circulation	–	1	3	–	1	3	1	2	2	7/9
Respiration	1	2	1	2	1	2	2	1	1	9/9
Cell division & cancer	2	1	1	1	2	1	2	1	1	9/9
Excretion & homeostasis	2	2	–	2	1	1	2	1	1	8/9
Immunity & disease	1	1	1	1	3	2	2	1	–	8/9
Nervous system & senses	1	2	1	2	1	1	–	1	2	8/9
Photosynthesis	1	2	1	1	2	1	1	1	1	9/9
Genetics & inheritance	1	1	1	1	2	1	1	1	1	9/9
Human reproduction	2	–	1	2	1	1	1	1	1	8/9
Digestion & diet	1	1	1	1	1	–	2	1	1	8/9
Evolution & variation	1	1	–	1	2	1	1	1	1	8/9
Hormones	–	2	1	2	–	1	1	1	1	7/9
DNA technology	1	1	–	1	–	2	1	1	–	6/9
Skeleton & muscles	1	–	1	1	1	1	1	1	–	7/9
Breathing	1	–	1	1	–	1	–	1	1	6/9

Darker = more questions. Source: State Examinations Commission papers, 2017 to 2026, read and grouped by GrindSpot. Every question we counted is listed at **grindspot.ie/exam-trends**. A guide to what has come up, not a prediction of what will.

Cells and plants lead. Cells: 24 of 147 questions; plant structure: 24 (including tropisms, now gone).

Experiments matter. 27 practical (Section B) questions, and 4 more only on the scientific method: a whole strand of the new course.

Biochemistry and DNA. Biomolecules and enzymes: 30 questions; DNA and genetics: 19.

What has gone. 24 questions had a part on content now off the course. Still, every topic came up in at least 6 of the 9 years.

TOPIC 9

Ecology & biotechnology

Worked answers →

In the real exam

45 questions of 147 (31%), 3 to 7 a paper, 2017 to 2026: Simpson's index, PCR and growth curves in the sample papers.



Fionn's tip: Simpson's index: $D_S = 1 - [\Sigma n(n-1)] \div [N(N-1)]$. Work out each $n(n-1)$ in a column, add them, then divide. Close to 1 means high diversity.

1. A student counted the ground plants in a woodland in Co. Wicklow.

Plant	bluebell	wood anemone	wood sorrel
Number counted	12	6	2

Calculate Simpson's diversity index, correct to two decimal places.

2. Sketch the pyramid of numbers for the food chain oak tree → caterpillars → blue tits. Why is it an odd shape? Why is a pyramid of biomass often more useful?

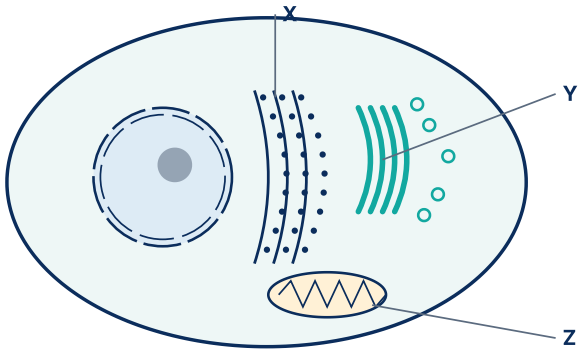
3. Explain the difference between an S-shaped and a J-shaped population curve, and what is meant by carrying capacity.

Question 1 is compulsory

50 marks

Question 1 (50 marks)

(a) The diagram shows part of an animal cell, as seen with an electron microscope.

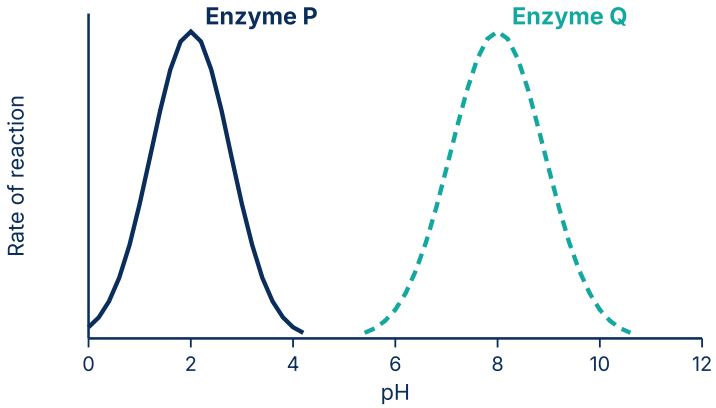


(i) Identify the organelles X, Y and Z.

(ii) Cells in the pancreas make and export the protein insulin. Describe how X and Y work together to do this.

(iii) Name one structure shown in the diagram that would not be found in a bacterial cell.

(b) The graph shows the effect of pH on the activity of two digestive enzymes, P and Q.



(i) State the optimum pH of each enzyme.

(ii) Suggest where in the human digestive system each enzyme works. Give a reason for each answer.

(iii) Explain why enzyme P has almost no activity at pH 6.

Each part shows a model answer and, below it, how its marks are given: the marks for each sub-part and what earns them. As in the SEC's biology marking schemes, marks go to each correct point made in the right context; other correct points are accepted. This is our guide, not an official scheme: the SEC has not published one for the new course. Give only the number of points asked for: a wrong extra answer can cancel a right one.

Question 1 (50 marks)

(a)

(i) X rough endoplasmic reticulum; Y Golgi apparatus; Z mitochondrion.

(ii) Ribosomes on the rough ER make the insulin; it passes into the ER, which carries it in vesicles to the Golgi. The Golgi modifies and packages it into vesicles, which move to the cell membrane and fuse with it, releasing the insulin.

(iii) Any one: rough ER, Golgi, mitochondrion, nucleus.

10 marks · (i) 3: 1 for each organelle · (ii) 4: 1 for each step: made on the ribosomes of X; carried in vesicles to Y; packaged by Y; vesicles fuse with the membrane · (iii) 3: one correct structure

(b)

(i) P: about pH 2; Q: about pH 8.

(ii) P in the stomach, which is very acidic (hydrochloric acid); Q in the small intestine (duodenum), which is slightly alkaline (pancreatic juice and bile).

(iii) At pH 6 the active site of P has changed shape (its bonds are disrupted), so the substrate no longer fits: it is denatured or inactive.

P pH 2, Q pH 8

10 marks · (i) 4: 2 for each value · (ii) 4: 1 for each place, 1 for each reason · (iii) 2: shape of the active site changed, so the substrate does not fit