

Mock Paper Set 1



Extended tier · Paper 2 (Multiple Choice) · Paper 4 (Theory) · Paper 6 (Alternative to Practical)

Written to the format of the Cambridge IGCSE Biology 0610 syllabus for examinations in 2026, 2027 and 2028

What is inside this set

Paper	Type	Time	Marks	What it tests
Paper 2	Multiple Choice (Extended)	45 minutes	40	40 questions, one mark each, across the whole syllabus (Core and Supplement)
Paper 4	Theory (Extended)	1 hour 15 minutes	80	6 structured questions: recall, explanation, data handling and calculations
Paper 6	Alternative to Practical	1 hour	40	2 questions: readings, results table, graph, drawing, evaluation and planning

Then: **worked solutions and mark schemes** for every question, a **topic map** (each question → syllabus reference → our notes chapter), an **"If you lost marks on..."** table and a percentage self-check.

How to use this set

1. Sit each paper in one go, **timed**, with no notes. Use a pencil and ruler for Paper 6.
2. For Paper 2, write your letter in the answer grid at the end of the paper.
3. Mark your work with the mark scheme. Each badge is one mark: **BI** independent mark; **CI** method mark, given when the final answer is wrong or missing (a correct final answer scores all the marks); **AI** correct final answer. Give a mark only when your answer says the same thing.
4. Read the worked solution for every question you lost marks on, then use the topic map to revise from the notes chapter.

Timing guide

- Paper 2: about 1 minute per question; leave 5 minutes to check.
- Paper 4: about 1 minute per mark (80 marks in 75 minutes).
- Paper 6: about 1.5 minutes per mark; draw graphs and tables carefully, they carry many marks.

★ **Exam tip:** Command words matter: **state** = short answer; **describe** = say what happens; **explain** = give reasons (why or how); **suggest** = apply your knowledge to a new situation.

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BIOLOGY 0610 • Mock Set 1**45 minutes****Paper 2 Multiple Choice (Extended)**

You will need: the answer grid at the end of this paper (or a multiple choice answer sheet), a soft pencil (type B or HB) and a soft clean eraser.

INSTRUCTIONS

- There are forty questions on this paper. Answer all questions.
- For each question there are four possible answers, A, B, C and D. Choose the one you consider correct and record your choice in soft pencil.
- Do not use correction fluid. You may use a calculator.

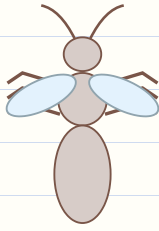
INFORMATION

- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.

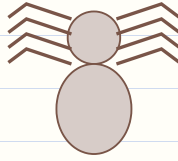
1. Which list contains **only** characteristics of all living organisms?

- A excretion, photosynthesis, sensitivity
- B growth, nutrition, reproduction
- C breathing, movement, respiration
- D digestion, excretion, growth

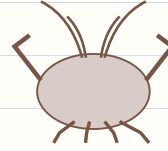
2. The diagram shows four arthropods, P, Q, R and S. They are not drawn to scale.



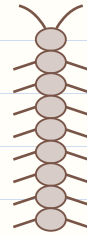
P



Q



R



S

1 (a) more than five pairs of legs	W
(b) five pairs of legs or fewer	go to 2
2 (a) antennae absent	X
(b) antennae present	go to 3
3 (a) wings present	Y
(b) wings absent	Z

Which row identifies P and Q using the key?

	P	Q
A	W	X
B	Y	W
C	Z	X
D	Y	X

3. Which features are present in **all** viruses?

- A genetic material and a protein coat B a cell membrane and genetic material
C cytoplasm and ribosomes D a cell wall and genetic material

4. Which structures are found in both a palisade mesophyll cell and a bacterial cell?

- A cell wall, chloroplasts and ribosomes
B cell membrane, nucleus and ribosomes
C cell membrane, cell wall and ribosomes
D cytoplasm, plasmids and cell wall

5. A student made a drawing of a red blood cell. The diameter of the drawing is 36 mm. The magnification of the drawing is $\times 4500$.

What is the actual diameter of the red blood cell?

- A $0.08 \mu\text{m}$ B $0.8 \mu\text{m}$ C $8 \mu\text{m}$ D $80 \mu\text{m}$

6. Blocks of agar jelly containing a pink indicator were cut to the sizes shown. The blocks were placed in dilute acid. The indicator becomes colourless when acid reaches it.

Which block will become completely colourless first?

	size of block / cm
A	$0.5 \times 4 \times 4$
B	$1 \times 1 \times 4$
C	$1 \times 2 \times 2$
D	$2 \times 2 \times 2$

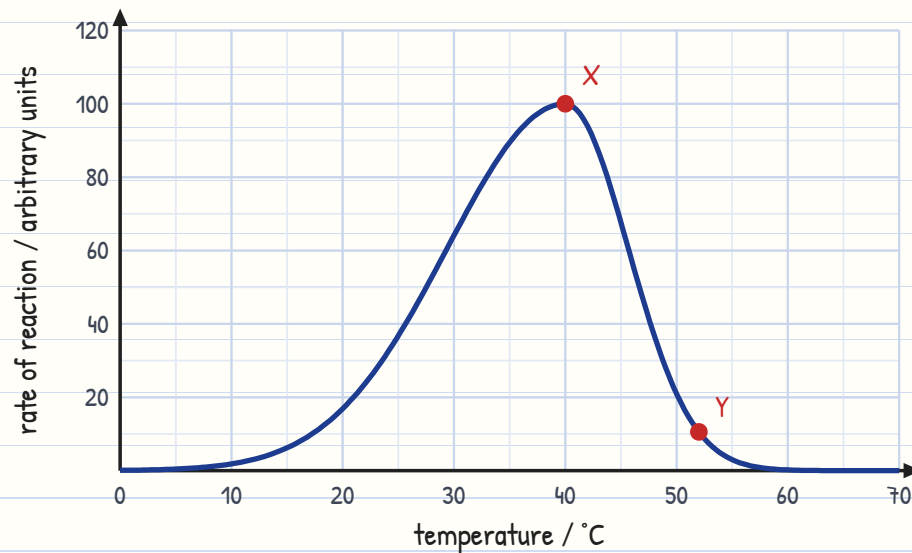
7. Cylinders of potato were placed in sucrose solutions of different concentrations for one hour. The table shows the percentage change in mass of each cylinder.

concentration of sucrose / mol per dm^3	0.0	0.2	0.4	0.6	0.8
percentage change in mass	+14	+5	-3	-10	-16

Which concentration of sucrose solution has approximately the same water potential as the potato cells?

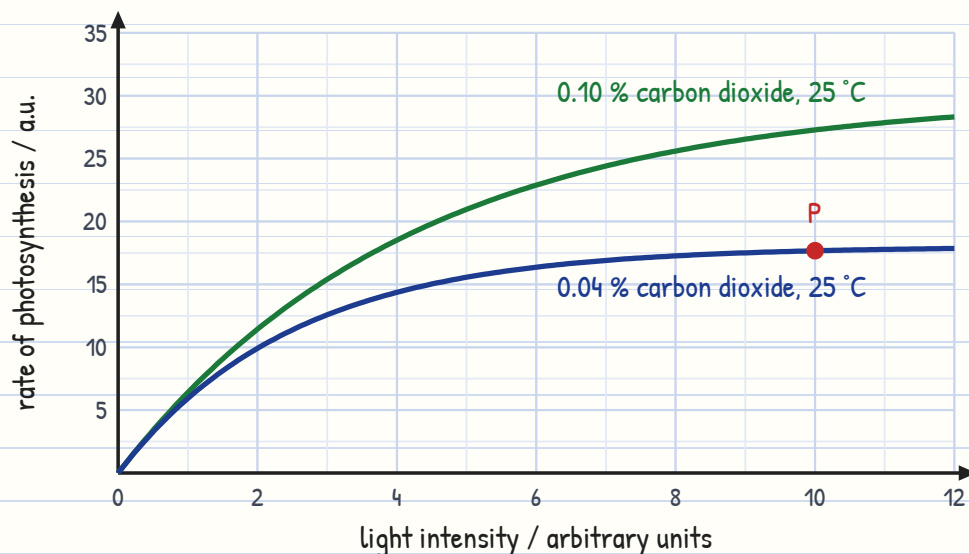
- A 0.10 mol per dm^3 B 0.33 mol per dm^3 C 0.45 mol per dm^3 D 0.60 mol per dm^3
8. The concentration of nitrate ions inside root hair cells is higher than in the soil water around them. The root hair cells continue to absorb nitrate ions.
- How are the nitrate ions absorbed?
- A by diffusion, down a concentration gradient
 B by osmosis, through a partially permeable membrane
 C by active transport, using energy from photosynthesis in the root hair cell
 D by active transport, using energy from respiration
9. In a molecule of DNA, 18% of the bases are A.
- What percentage of the bases are C?
- A 32% B 36% C 64% D 82%

10. The graph shows the effect of temperature on the rate of a reaction catalysed by an enzyme.



Which statement explains the change in the rate of reaction between X and Y?

- A The enzyme molecules are killed by the high temperature.
 - B The shape of the active site changes, so fewer enzyme-substrate complexes form.
 - C The substrate molecules are denatured, so they no longer fit the enzyme.
 - D The molecules have less kinetic energy, so they collide less often.
11. The graph shows the rate of photosynthesis of a plant at different light intensities and two concentrations of carbon dioxide.



Which factor is limiting the rate of photosynthesis at point P?

- A light intensity
 - B oxygen concentration
 - C water availability
 - D carbon dioxide concentration
12. Which row correctly links a leaf structure to how it adapts the leaf for photosynthesis?

	structure	adaptation
A	waxy cuticle	allows carbon dioxide to diffuse into the leaf
B	upper epidermis	contains many chloroplasts to absorb light
C	air spaces in the spongy mesophyll	allow carbon dioxide to diffuse to the mesophyll cells
D	phloem	brings water to the mesophyll cells

13. Which row is correct?

	<i>nutrient</i>	<i>good dietary source</i>	<i>disease caused by a lack of the nutrient</i>
A	calcium	citrus fruit	scurvy
B	vitamin D	oily fish	rickets
C	vitamin C	milk	rickets
D	iron	citrus fruit	scurvy

14. Which row describes the digestion of protein in the stomach and in the small intestine?

	<i>protease in the stomach</i>	<i>conditions in the stomach</i>	<i>protease in the small intestine</i>	<i>conditions in the small intestine</i>
A	pepsin	acidic	trypsin	alkaline
B	trypsin	acidic	pepsin	alkaline
C	pepsin	alkaline	trypsin	acidic
D	amylase	acidic	maltase	alkaline

15. In which part of the alimentary canal is most water absorbed into the blood?

- A** stomach **B** colon **C** rectum **D** small intestine

16. Which conditions give the highest rate of transpiration?

	<i>temperature</i>	<i>humidity</i>	<i>air movement</i>
A	low	high	still
B	high	high	windy
C	high	low	windy
D	low	low	still

17. Which part of a potato plant is acting as a **source** of sucrose for translocation?

- A** a tuber in spring, while new shoots are growing from it
B a developing seed
C a growing root tip
D a tuber in summer, while it is growing and storing starch

18. The muscles in the walls of the ventricles contract.

Which row shows the state of the valves in the heart?

	<i>atrioventricular valves</i>	<i>semilunar valves</i>
A	open	open
B	closed	open
C	open	closed
D	closed	closed

19. Which row shows the functions of phagocytes and lymphocytes?

	<i>phagocytes</i>	<i>lymphocytes</i>
A	produce antibodies	engulf pathogens
B	engulf pathogens	transport oxygen
C	engulf pathogens	produce antibodies
D	convert fibrinogen to fibrin	produce antibodies

20. Which is an example of passive immunity?

- A** antibodies made by a child after a vaccination
- B** antibodies made by a person while recovering from measles
- C** memory cells that remain in the blood after an infection
- D** antibodies that pass to a baby in breast milk

21. Which row describes what happens during inspiration?

	<i>external intercostal muscles</i>	<i>diaphragm muscles</i>	<i>volume of thorax</i>	<i>pressure in thorax</i>
A	contract	contract	increases	decreases
B	contract	relax	increases	increases
C	relax	contract	decreases	decreases
D	relax	relax	decreases	increases

22. After a sprint race, an athlete continues to breathe deeply and quickly for several minutes.

What is the main reason for this?

- A** to remove the carbon dioxide made by anaerobic respiration in the muscles
- B** to supply oxygen for the aerobic respiration of glucose in the lungs
- C** to supply oxygen for the aerobic respiration of lactic acid in the liver
- D** to supply oxygen to convert lactic acid into alcohol in the muscles

23. Which row is correct for a healthy person? (✓ = present, X = absent)

	<i>protein in the filtrate in the nephron</i>	<i>glucose in the filtrate in the nephron</i>	<i>glucose in the urine</i>
A	✓	✓	X
B	X	X	X
C	✓	X	X
D	X	✓	X

24. Four events at a synapse are listed.

- 1 Neurotransmitter molecules bind to receptor proteins.
- 2 An impulse arrives and vesicles release neurotransmitter molecules.
- 3 Neurotransmitter molecules diffuse across the synaptic gap.
- 4 An impulse is stimulated in the next neurone.

What is the correct order of these events?

- A** 3 → 2 → 1 → 4 **B** 2 → 3 → 1 → 4 **C** 2 → 1 → 3 → 4 **D** 1 → 3 → 2 → 4

25. A student looks up from a distant tree to read a book held close to her eyes.

Which row describes the changes in her eyes?

	<i>ciliary muscles</i>	<i>suspensory ligaments</i>	<i>lens</i>
A	relax	become tight	becomes thinner
B	contract	become slack	becomes more rounded
C	contract	become tight	becomes more rounded
D	relax	become slack	becomes thinner

26. Which row shows the effects of adrenaline?

	<i>blood glucose concentration</i>	<i>heart rate</i>	<i>pupil diameter</i>
A	increases	increases	increases
B	increases	decreases	increases
C	decreases	increases	decreases
D	decreases	increases	increases

27. The blood glucose concentration of a person falls below the set point.

Which response returns it to the set point?

- A** The pancreas secretes insulin and the liver converts glucose to glycogen.
- B** The pancreas secretes glucagon and the liver converts glucose to glycogen.
- C** The liver secretes glucagon and converts glycogen to glucose.
- D** The pancreas secretes glucagon and the liver converts glycogen to glucose.

28. A plant shoot is lit from one side only. It grows towards the light.

Which statement explains this response?

- A** Auxin moves to the lit side and stimulates cell elongation there.
- B** Auxin is made on the lit side and stops cell division there.
- C** Auxin moves to the shaded side and stimulates cell elongation there.
- D** Auxin moves to the shaded side and inhibits cell elongation there.

29. Why should antibiotics be used only when they are essential?

- A** Antibiotics cause bacteria to mutate into resistant forms.
- B** Each use kills susceptible bacteria, so any resistant bacteria survive, reproduce and become more common.
- C** Antibiotics also kill the viruses that protect the body from infection.
- D** Bacteria make antibodies against antibiotics after they have been exposed to them.

30. Which row describes a wind-pollinated flower?

	<i>anthers</i>	<i>stigmas</i>	<i>pollen grains</i>
A	hang outside the flower	large and feathery, outside the flower	small, light and smooth
B	inside the flower	large and feathery, outside the flower	large and sticky
C	hang outside the flower	small, inside the flower	small, light and smooth
D	inside the flower	small, inside the flower	large with spikes

31. During pregnancy, progesterone is secreted at first by an ovary.

Which organ later takes over the secretion of progesterone?

- A amniotic sac B pituitary gland C placenta D umbilical cord

32. Which statement about the making of a protein in a cell is correct?

- A The gene leaves the nucleus and passes through a ribosome.
 B mRNA is a copy of a whole chromosome.
 C The ribosome decides the sequence of amino acids in the protein.
 D mRNA is made in the nucleus and moves to the ribosomes in the cytoplasm.

33. The diploid number of chromosomes in a species of plant is 24.

Which row describes the cells produced by mitosis and by meiosis in this plant?

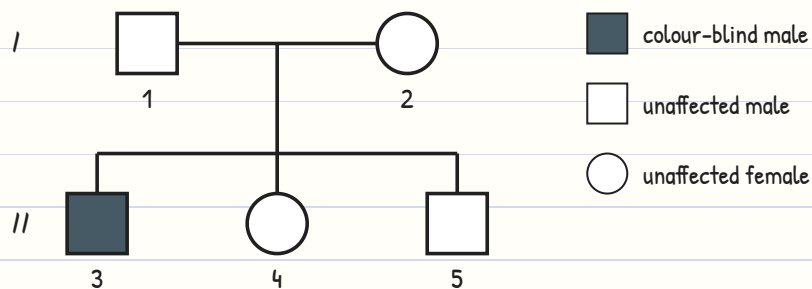
	<i>cells produced by mitosis</i>	<i>cells produced by meiosis</i>
A	24 chromosomes, genetically identical	12 chromosomes, genetically different
B	24 chromosomes, genetically different	12 chromosomes, genetically identical
C	12 chromosomes, genetically identical	12 chromosomes, genetically different
D	24 chromosomes, genetically identical	24 chromosomes, genetically different

34. A man with blood group A and a woman with blood group B have a child with blood group O.

What are the genotypes of the man and the woman?

- A $I^A I^A$ and $I^B I^O$ B $I^A I^O$ and $I^B I^O$
 C $I^A I^B$ and $I^O I^O$ D $I^A I^A$ and $I^B I^B$

35. The pedigree diagram shows the inheritance of red-green colour blindness in a family.



What is the probability that the next son born to 1 and 2 will be colour-blind?

- A 0% B 12.5% C 25% D 50%

36. Four statements about natural selection are listed.

- 1 There is genetic variation within the population.
- 2 Individuals change during their lifetime to become better adapted.
- 3 Better adapted individuals are more likely to survive and reproduce.
- 4 Better adapted individuals pass on their alleles to the next generation.

Which statements are correct?

- A 1, 2 and 3 B 2 and 4 only C 1, 3 and 4 D 1, 2, 3 and 4

37. The energy in each trophic level of a food chain is shown, in kJ per m² per year.

grass 25 000 → grasshoppers 2000 → frogs 240

What percentage of the energy in the grasshoppers is transferred to the frogs?

A 0.96%

B 8.0%

C 12%

D 88%

38. Which process in the nitrogen cycle is carried out by nitrifying bacteria?

A ammonium ions → nitrate ions

B nitrogen gas → ammonium ions

C nitrate ions → nitrogen gas

D protein in dead organisms → ammonium ions

39. Some events in the eutrophication of a lake are listed.

1 Algae and plants die.

2 The concentration of nitrate ions in the water increases.

3 Decomposers increase in number and respire aerobically.

4 The concentration of dissolved oxygen decreases.

5 Algae and plants grow rapidly.

What is the correct order?

A 2 → 1 → 5 → 3 → 4

B 5 → 2 → 3 → 1 → 4

C 2 → 5 → 3 → 1 → 4

D 2 → 5 → 1 → 3 → 4

40. A human gene is inserted into a bacterial plasmid.

Which row shows the enzymes used?

	<i>enzyme that cuts open the plasmid</i>	<i>enzyme that joins the human gene into the plasmid</i>
A	DNA ligase	restriction enzyme
B	restriction enzyme	DNA ligase
C	restriction enzyme	restriction enzyme
D	DNA ligase	DNA ligase

Paper 2 answer grid

Write A, B, C or D next to each question number.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

Worked solutions and mark scheme

Paper 2 Multiple Choice: answer key

1 B	2 D	3 A	4 C	5 C	6 A	7 B	8 D	9 A	10 B
11 D	12 C	13 B	14 A	15 D	16 C	17 A	18 B	19 C	20 D
21 A	22 C	23 D	24 B	25 B	26 A	27 D	28 C	29 B	30 A
31 C	32 D	33 A	34 B	35 D	36 C	37 C	38 A	39 D	40 B

Each correct answer scores 1 mark (total 40). The key has ten each of A, B, C and D. For each question: why the answer is right, and why the most tempting wrong option is wrong.

1 B. Growth, nutrition and reproduction are three of the seven characteristics (movement, respiration, sensitivity, growth, reproduction, excretion, nutrition). A: photosynthesis happens only in plants and some protocists. C: breathing is a ventilation movement of some animals; it is not respiration. D: digestion is not done by plants.

2 D. P has three pairs of legs (five or fewer → 2), antennae (→ 3) and wings → Y. Q has four pairs of legs (→ 2) and no antennae → X. B: Q has 8 legs, which is four pairs, not more than five pairs. C: P has wings, so it is Y, not Z.

3 A. A virus is a strand of genetic material (DNA or RNA) inside a protein coat. B, C, D: viruses are not cells, so they have no cell membrane, cytoplasm, ribosomes or cell wall.

4 C. Both cells have a cell membrane, a cell wall and ribosomes (and cytoplasm). B: bacteria have no nucleus (their DNA is a circular loop in the cytoplasm). A: bacteria have no chloroplasts. D: a palisade cell has no plasmids.

5 C. actual size = image size ÷ magnification = $36 \text{ mm} \div 4500 = 0.008 \text{ mm}$; $\times 1000 = 8 \mu\text{m}$. B and D come from moving the decimal point the wrong way when converting mm to μm ($1 \text{ mm} = 1000 \mu\text{m}$).

6 A. Surface area : volume ratios are A $0.5 \times 4 \times 4 \text{ cm}$: 5.0; B $1 \times 1 \times 4 \text{ cm}$: 4.5; C $1 \times 2 \times 2 \text{ cm}$: 4.0; D $2 \times 2 \times 2 \text{ cm}$: 3.0. Block A has the largest ratio and is only 0.5 cm thick, so acid has the shortest distance (0.25 cm) to diffuse to its centre. D: same volume as A (8 cm^3) but the smallest ratio and the longest distance to the centre (1 cm), so it is slowest.

7 B. There is no change in mass where the line crosses 0%: between 0.2 (+5%) and 0.4 (−3%). By proportion: $0.2 \div 0.2 \times 5 \div 8 = 0.325 \approx 0.33 \text{ mol per dm}^3$. Here the water potential of the solution equals that of the cells, so there is no net osmosis. A: at 0.10 the cylinders still gain mass. C: at 0.45 they already lose mass.

8 D. Ions move against their concentration gradient by active transport, using protein carriers and energy from respiration. C: root hair cells have no chloroplasts; the energy always comes from respiration. A: diffusion only moves particles down a gradient.

9 A. A pairs with T, so T = 18% and A + T = 36%. C + G = $100 - 36 = 64\%$, and C = G, so C = 32%. C (64%) is C + G together. B (36%) is A + T.

10 B. Above the optimum (X), the enzyme is denatured: its active site changes shape, so the substrate no longer fits and fewer enzyme-substrate complexes form. A: enzymes are proteins, not living things, so they cannot be "killed". D: kinetic energy increases with temperature.

11 D. At P the 0.04% curve has levelled off, so light is no longer limiting. The 0.10% curve is higher at the same light intensity, so carbon dioxide concentration is limiting. A: light intensity is limiting only on the rising part of the curve.

12 C. Air spaces let carbon dioxide diffuse to the mesophyll cells. A: the waxy cuticle reduces water loss; gases enter through stomata. B: the upper epidermis is transparent with few or no chloroplasts, so light passes to the palisade layer. D: xylem brings water; phloem carries sucrose.

13 B. Vitamin D (oily fish, also made in the skin in sunlight) is needed to absorb calcium; a lack causes rickets. C: vitamin C deficiency causes scurvy, and citrus fruit (not milk) is a good source. A and D: calcium is found in milk; iron in red meat and green vegetables.

- 14 A.** Pepsin works in the acidic stomach; trypsin works in the alkaline small intestine. B and C swap the enzymes or the pH. D: amylase and maltase digest starch and maltose, not protein.
- 15 D.** Most water is absorbed in the small intestine; some is also absorbed in the colon. B is the common error: the colon absorbs only part of the water.
- 16 C.** High temperature gives faster evaporation and diffusion; low humidity and wind keep a steep water-vapour concentration gradient between the air spaces and the air. B: high humidity reduces the gradient, even in wind.
- 17 A.** A source releases sucrose into the phloem. In spring the tuber's starch is converted to sucrose and moved to the new shoots. D: in summer the tuber receives sucrose and stores it as starch, so it is a sink. B and C are sinks.
- 18 B.** When the ventricles contract, pressure in them rises: the atrioventricular valves close (stopping backflow into the atria) and the semilunar valves open as blood is pushed into the arteries. C is the state when the ventricles relax and fill.
- 19 C.** Phagocytes engulf pathogens by phagocytosis; lymphocytes produce antibodies. A swaps them. D: fibrinogen is converted to fibrin during clotting, which involves platelets.
- 20 D.** Passive immunity = antibodies received from another individual (across the placenta or in breast milk). It is short-term, with no memory cells. A, B and C are active immunity: the person's own lymphocytes make the antibodies and memory cells.
- 21 A.** External intercostal muscles contract (ribs up and out) and the diaphragm contracts (flattens). Thorax volume increases, pressure falls below atmospheric pressure, and air moves in. D describes normal expiration.
- 22 C.** Lactic acid from anaerobic respiration is carried to the liver and broken down by aerobic respiration. The extra oxygen needed is the oxygen debt. A: anaerobic respiration in muscle makes lactic acid only, no carbon dioxide. D: alcohol is made by yeast, not by muscle.
- 23 D.** Protein molecules are too large to be filtered at the glomerulus. Glucose is filtered, then all of it is reabsorbed, so none is in the urine. A and C wrongly put protein in the filtrate. B: glucose is a small molecule and is filtered.
- 24 B.** An impulse arrives, vesicles release neurotransmitter (2), it diffuses across the gap (3), binds to receptor proteins (1), and an impulse starts in the next neurone (4). C puts binding before diffusion, which is impossible.
- 25 B.** For a near object the ciliary muscles contract, the suspensory ligaments become slack and the lens becomes more rounded, so it refracts light more. A is the change for a distant object. C: when the ciliary muscles contract the ligaments slacken, not tighten.
- 26 A.** Adrenaline increases blood glucose concentration, heart rate and pupil diameter (and breathing rate). D: adrenaline raises blood glucose; it does not lower it.
- 27 D.** Low blood glucose → the pancreas secretes glucagon → the liver converts glycogen into glucose, which goes into the blood. C: glucagon is secreted by the pancreas, not the liver. A is the response to high blood glucose.
- 28 C.** Auxin made in the shoot tip moves to the shaded side; there it stimulates more cell elongation, so the shaded side grows longer and the shoot bends towards the light. D: in shoots auxin stimulates elongation (inhibition is not the explanation needed here).
- 29 B.** Resistance arises by random mutation. Using an antibiotic kills the susceptible bacteria, so resistant bacteria survive and reproduce: natural selection. Using antibiotics less means less selection for resistant strains such as MRSA. A: the antibiotic does not cause the mutation; it only selects bacteria that already carry it. C: antibiotics do not affect viruses.
- 30 A.** Wind-pollinated flowers have anthers hanging outside to release pollen into the wind, large feathery stigmas outside to catch it, and small, light, smooth pollen. C: the stigmas must be outside the flower to catch airborne pollen. D describes an insect-pollinated flower.