A-Level Biology Practice Test 19

60 original multiple-choice questions covering all 19 Cambridge A-Level Biology 9700 topics. Choose one answer for each question. The full answer key is on the last page — worked explanations for every question are free on the test page at QuaidianPoint.com.

Name: _____ Class: _____ Score: _____ / 60

Cell structure

Q1. The cytoskeleton in eukaryotic cells is important because it does what?

(A) Provides structural support, organelle positioning and tracks for vesicle movement
(B) Synthesises ATP for the cell
(C) Stores genetic information in the cytoplasm
(D) Forms the outer cell wall in animal cells

Q2. Which structure is the site of ribosome production in a eukaryotic cell?

(A) Smooth endoplasmic reticulum
(B) Nucleolus within the nucleus
(C) Golgi apparatus
(D) Lysosome

Q3. Lysosomes are important in phagocytes because they contain what?

(A) Chlorophyll for photosynthesis
(B) DNA for protein synthesis
(C) Hydrolytic enzymes that digest ingested material
(D) ATP synthase for energy production

Biological molecules

Q4. Cellulose is a structural polysaccharide in plant cell walls. Which feature makes it strong?

(A) Alpha-glucose units joined by 1,4-glycosidic bonds into a helix
(B) Beta-glucose units joined by 1,4-glycosidic bonds into straight chains held together by hydrogen bonds
(C) Branched chains with many 1,6-glycosidic bonds
(D) Alternating glucose and fructose units

Q5. Phospholipids are suited to forming cell membranes because they are what?

(A) Completely hydrophobic molecules
(B) Completely hydrophilic molecules
(C) Amphipathic, with hydrophilic heads and hydrophobic tails that form a bilayer in water
(D) Large proteins that span the membrane

Q6. A heat-denatured enzyme is cooled slowly, but its catalytic activity does not return. Which explanation best fits this result?

(A) The sequence of amino acids in the enzyme has been rearranged
(B) New peptide bonds have formed between different amino acids
(C) The enzyme has gained extra subunits from the surrounding solution
(D) Its tertiary structure, held by weak bonds, has unfolded irreversibly and the active site shape is lost

Enzymes

Q7. End-product inhibition is a form of feedback control in metabolic pathways. How does it work?

(A) The end product denatures all enzymes in the cell permanently
(B) The end product increases the activity of the first enzyme in the pathway
(C) The end product acts as a non-competitive inhibitor of an early enzyme in the pathway, slowing its own production
(D) The end product is converted back into the original substrate

Q8. Why do enzymes show specificity for their substrates?

(A) All enzymes have identical active sites
(B) Substrates are all the same shape
(C) Enzymes bind any molecule that collides with them
(D) The active site has a specific shape and chemical properties complementary to the substrate

Q9. Which graph shape is expected for enzyme activity against temperature, and why does activity fall after the optimum?

(A) Activity rises to an optimum as collisions increase, then falls sharply as the enzyme denatures
(B) Activity falls steadily as temperature rises
(C) Activity stays constant at all temperatures
(D) Activity rises steadily with temperature and never falls

Cell membranes and transport

Q10. Glycoproteins in the cell surface membrane are important for which function?

(A) Transporting water through aquaporins
(B) Providing energy for active transport
(C) Forming the lipid bilayer itself
(D) Cell recognition and adhesion, including immune recognition of self cells

Q11. Which molecule can cross the lipid bilayer by simple diffusion most easily?

(A) A small, non-polar molecule such as oxygen
(B) A large charged ion such as sodium
(C) A large polar molecule such as glucose
(D) A protein such as haemoglobin

Q12. The sodium-potassium pump is an example of active transport because it does what?

(A) Allows sodium ions to diffuse down their gradient
(B) Uses ATP to move sodium out and potassium in against their gradients
(C) Opens a channel for passive movement of both ions
(D) Transports water molecules by osmosis

The mitotic cell cycle

Q13. During prophase of mitosis, which changes occur?

(A) Chromosomes condense, the nuclear envelope breaks down, and spindle fibres form
(B) Sister chromatids separate to opposite poles
(C) Chromosomes align on the equator
(D) The cell divides into two daughter cells

Q14. Telophase of mitosis is characterised by which events?

(A) Chromosomes condense and spindle fibres appear
(B) Nuclear envelopes reform and chromosomes decondense
(C) Sister chromatids are pulled apart
(D) DNA is replicated

Q15. Cancer may develop when mutations affect genes controlling the cell cycle. Which type of gene, when mutated, fails to stop uncontrolled division?

(A) A gene for haemoglobin production
(B) A gene for chlorophyll synthesis
(C) A tumour suppressor gene, which normally inhibits division or triggers repair or cell death
(D) A gene for antibody production

Nucleic acids and protein synthesis

Q16. Gene control in eukaryotes often involves transcription factors. What do transcription factors do?

(A) They copy DNA during replication
(B) They bind to specific DNA sequences and regulate whether RNA polymerase transcribes a gene
(C) They translate mRNA into protein at the ribosome
(D) They cut DNA at restriction sites

Q17. Which statement about the start codon is correct?

(A) It signals the end of translation
(B) It is found only in prokaryotic mRNA
(C) It is AUG, coding for methionine and marking where translation begins
(D) It codes for the final amino acid in every protein

Q18. A nonsense mutation differs from a missense mutation in that a nonsense mutation does what?

(A) Changes one amino acid to another
(B) Leaves the amino acid sequence unchanged
(C) Deletes an entire gene from the chromosome
(D) Creates a premature stop codon, truncating the protein

Transport in plants

Q19. Which adaptation of root hair cells increases the rate of water uptake?

(A) Thick lignified walls
(B) Absence of a cell membrane
(C) A large surface area from the elongated hair and a thin wall
(D) A large permanent vacuole filled with air

Q20. Water moves through a plant by the apoplast pathway. What does this pathway involve?

(A) Movement through the cytoplasm of living cells via plasmodesmata
(B) Movement through vacuoles only
(C) Movement inside xylem vessels after reaching the endodermis
(D) Movement through cell walls and intercellular spaces, without crossing cell membranes, until the Casparian strip

Q21. Sinks in phloem transport include which examples?

(A) Growing roots, developing fruits and storage organs that import assimilates
(B) Mature photosynthetic leaves exporting sucrose
(C) Xylem vessels carrying water upward
(D) Stomata releasing water vapour

Transport in mammals

Q22. After oxygenation in the lungs, blood returns to the left atrium through which vessel?

(A) Pulmonary artery
(B) Vena cava
(C) Hepatic vein
(D) Pulmonary vein

Q23. Capillaries are adapted for exchange by which features?

(A) Walls one cell thick, narrow lumens slowing flow, and a very large total surface area
(B) Thick muscular walls and valves
(C) Elastic tissue that maintains high pressure
(D) A wide lumen and rapid blood flow

Q24. Excess tissue fluid that is not reabsorbed into capillaries is returned to the blood by which system?

(A) The hepatic portal system
(B) The lymphatic system, draining into veins near the heart
(C) The pulmonary circulation
(D) The renal system only

Gas exchange

Q25. In fish gills, water flows over lamellae in the opposite direction to blood flow inside them. What advantage does this arrangement give?

(A) It maintains a diffusion gradient along the whole lamella, maximising oxygen uptake
(B) Fish ventilate their lungs by rib movements
(C) Fish use a diaphragm to draw water over the gills
(D) Fish rely only on diffusion of water through their skin

Q26. In mammals, the trachea is kept open by which structures?

(A) Smooth muscle rings that contract fully around it
(B) C-shaped rings of cartilage that prevent collapse while allowing the oesophagus to expand
(C) Bone plates surrounding the airway
(D) Alveoli attached to its walls

Q27. Goblet cells in the airways produce mucus. What is the function of this mucus combined with cilia?

(A) To absorb oxygen into the blood
(B) To warm inhaled air only
(C) To trap dust and pathogens, which cilia then move upward toward the throat
(D) To increase the surface area for gas exchange

Infectious diseases

Q28. Which pathogen causes malaria, and what type of organism is it?

(A) A bacterium transmitted by contaminated water
(B) A protoctist of the genus Plasmodium, transmitted by Anopheles mosquitoes
(C) A virus transmitted by airborne droplets
(D) A fungus growing on skin

Q29. Why do people with HIV become vulnerable to opportunistic infections?

(A) HIV destroys red blood cells, causing anaemia
(B) HIV blocks all phagocytosis immediately
(C) HIV destroys helper T cells, weakening both humoral and cell-mediated immunity
(D) HIV prevents the skin from acting as a barrier

Q30. The best strategy to reduce antibiotic resistance in hospitals includes which combination?

(A) Prescribing antibiotics for all viral infections as a precaution
(B) Stopping antibiotic courses as soon as symptoms improve
(C) Sharing antibiotics between patients to save supplies
(D) Prescribing antibiotics only when needed, completing courses, and practising strict hygiene

Immunity

Q31. Clonal selection in B lymphocytes means what?

(A) All B cells produce the same antibody regardless of antigen
(B) B cells mutate to create a new antigen
(C) A B cell with a receptor matching an antigen is selected to divide, producing identical plasma cells and memory cells
(D) B cells are selected by antibiotics in the blood

Q32. Autoimmune disease occurs when the immune system does what?

(A) Fails to produce any antibodies
(B) Produces antibodies only against foreign antigens
(C) Loses all memory cells after infection
(D) Mistakenly attacks the body’s own tissues as if they were foreign

Q33. Natural active immunity is acquired by which route?

(A) Infection with a pathogen, followed by the body's own immune response and memory cell formation
(B) Injection of ready-made antibodies
(C) Vaccination with a weakened pathogen
(D) Transfer of antibodies across the placenta only

Energy and respiration

Q34. Glycolysis occurs in the cytoplasm and produces which net yield per glucose molecule?

(A) 32 ATP and 2 reduced NAD
(B) 4 ATP, no reduced NAD and 1 pyruvate
(C) 6 ATP and 6 carbon dioxide
(D) A net yield of 2 ATP, 2 reduced NAD and 2 pyruvate molecules

Q35. The link reaction converts pyruvate to acetyl coenzyme A. What else is produced in this step?

(A) Carbon dioxide and reduced NAD
(B) Oxygen and ATP directly
(C) Glucose and water
(D) Lactate and ethanol

Q36. Why does cyanide poisoning rapidly stop aerobic respiration?

(A) It prevents glycolysis in the cytoplasm
(B) It inhibits the final cytochrome in the electron transport chain, so electrons cannot be passed to oxygen
(C) It breaks down all ATP in the cell
(D) It prevents glucose entering the cell

Photosynthesis

Q37. Which statement about photosystem I and photosystem II is correct?

(A) Photosystem II acts first, splitting water and passing electrons via carriers to photosystem I
(B) Photosystem I acts first and directly splits water
(C) Only photosystem I is involved in non-cyclic photophosphorylation
(D) Both photosystems produce glucose directly

Q38. In the Calvin cycle, carbon dioxide is fixed by combining with which molecule, catalysed by which enzyme?

(A) Glycerate 3-phosphate, catalysed by ATP synthase
(B) Ribulose bisphosphate, catalysed by rubisco
(C) Triose phosphate, catalysed by chlorophyll
(D) Glucose, catalysed by amylase

Q39. At low temperature, photosynthesis rate is limited mainly because of what?

(A) Stomata close permanently
(B) Chlorophyll is destroyed
(C) Enzyme activity in the Calvin cycle is reduced, slowing carbon fixation
(D) Light absorption stops completely

Homeostasis

Q40. Negative feedback is essential in homeostasis because it does what?

(A) Amplifies any change in the internal environment
(B) Reverses a change, returning the controlled variable toward its set point
(C) Prevents any response to external stimuli
(D) Maintains a variable at a constantly rising level

Q41. Which hormone is released by the posterior pituitary gland to regulate water balance?

(A) Insulin
(B) Glucagon
(C) Antidiuretic hormone
(D) Thyroxine

Q42. In osmoregulation, a person who drinks a large volume of water will produce urine that is how different, and why?

(A) Small in volume and concentrated, because ADH rises
(B) Large in volume and dark, because the kidney cannot process water
(C) Unchanged, because water intake does not affect ADH
(D) Large in volume and dilute, because ADH falls and less water is reabsorbed

Control and coordination

Q43. Which sequence correctly describes transmission across a synapse?

(A) Neurotransmitter is released from the postsynaptic membrane into the presynaptic cell
(B) An action potential jumps directly from one neurone to the next without chemicals
(C) Neurotransmitter diffuses across the synaptic cleft, binds receptors, and triggers a response in the postsynaptic cell
(D) Calcium ions flow from the postsynaptic cell into the presynaptic cell

Q44. The resting potential of a neurone is maintained mainly by which mechanism?

(A) Open sodium channels allowing sodium to flood in
(B) Closed potassium channels preventing any potassium movement
(C) Neurotransmitter constantly released at synapses
(D) Sodium-potassium pumps and differential membrane permeability, keeping the inside negative relative to outside

Q45. Which plant hormone promotes fruit ripening and leaf abscission?

(A) Ethene
(B) Auxin only
(C) Gibberellin only
(D) Cytokinin only

Inheritance

Q46. A man with blood group AB marries a woman with blood group O. What blood groups are possible in their children?

(A) AB only
(B) O only
(C) AB and O only
(D) A and B only

Q47. Colour blindness is an X-linked recessive condition. A colour-blind man marries a woman with normal vision whose father was colour-blind. What proportion of their daughters will be colour-blind?

(A) Half of their daughters
(B) None, because daughters receive a normal X chromosome from their mother in every case
(C) All of their daughters
(D) One quarter of their daughters

Q48. In a monohybrid cross between two heterozygotes, the genotypic ratio in the offspring is which ratio?

(A) 3:1 dominant to recessive phenotype
(B) 1 homozygous dominant : 2 heterozygous : 1 homozygous recessive
(C) 9:3:3:1
(D) 1:1

Selection and evolution

Q49. Which definition of a species is most widely used in A-Level biology?

(A) A group of organisms that can interbreed to produce fertile offspring
(B) A group of organisms that look identical
(C) A group of organisms living in the same habitat
(D) A group of organisms with the same chromosome number only

Q50. Stabilising selection is most likely to occur in which situation?

(A) A population colonises a completely new environment
(B) The environment is stable and the average phenotype is already well adapted
(C) Two different niches favour opposite extremes
(D) A new predator favours only the largest individuals

Q51. Genetic drift has the greatest effect in which populations?

(A) Very large populations with random mating
(B) Populations with high gene flow
(C) Small populations, where chance events can change allele frequencies markedly
(D) Populations under strong directional selection only

Q52. Using the Hardy-Weinberg equation, if the frequency of a recessive allele is 0.2, what is the expected frequency of homozygous recessive individuals?

(A) 0.04
(B) 0.20
(C) 0.40
(D) 0.80

Classification, biodiversity and conservation

Q53. Which level of biodiversity refers to variation in genes within a species?

(A) Ecosystem diversity
(B) Genetic diversity
(C) Species diversity only
(D) Habitat diversity only

Q54. Habitat fragmentation threatens species because it does what?

(A) Increases the total area of habitat available
(B) Connects populations with corridors
(C) Isolates small populations, increasing inbreeding and edge effects
(D) Removes all predators from the area

Q55. Which conservation approach involves protecting a whole ecosystem in a national park?

(A) Captive breeding in a zoo
(B) Seed banking
(C) Botanical garden cultivation
(D) In situ conservation

Q56. The main ethical argument against keeping endangered animals only in zoos is which concern?

(A) Zoos are always more expensive than reserves
(B) Animals cannot breed in captivity at all
(C) Captive populations lose all genetic diversity immediately
(D) Ex situ conservation alone cannot preserve natural behaviours, interactions and evolutionary processes

Genetic technology

Q57. A vector in genetic engineering is best defined as what?

(A) A bacterium that produces antibiotics
(B) An enzyme that cuts DNA
(C) A carrier DNA molecule, such as a plasmid, used to transfer a gene into a host cell
(D) A primer used in PCR

Q58. DNA ligase is used in recombinant DNA technology to do what?

(A) Cut DNA at specific sequences
(B) Amplify DNA by PCR
(C) Separate DNA fragments by size
(D) Join DNA fragments by forming phosphodiester bonds between them

Q59. Which application of genetic technology raises the most direct concern about gene flow to wild relatives?

(A) Growing herbicide-resistant GM crops near wild relatives that could receive the gene by pollination
(B) Using PCR in a laboratory to diagnose disease
(C) Producing insulin in contained bacterial fermenters
(D) Using DNA profiling for forensic identification

Q60. In PCR, primers are needed because DNA polymerase can only do what?

(A) Copy DNA without a template, using primers as a guide for the whole genome
(B) Start synthesis at a free 3-prime hydroxyl group and extend an existing strand
(C) Denature DNA at high temperature
(D) Join Okazaki fragments on the lagging strand

Answer Key

Q1: A	Q11: A	Q21: A	Q31: C	Q41: C	Q51: C
Q2: B	Q12: B	Q22: D	Q32: D	Q42: D	Q52: A
Q3: C	Q13: A	Q23: A	Q33: A	Q43: C	Q53: B
Q4: B	Q14: B	Q24: B	Q34: D	Q44: D	Q54: C
Q5: C	Q15: C	Q25: A	Q35: A	Q45: A	Q55: D
Q6: D	Q16: B	Q26: B	Q36: B	Q46: D	Q56: D
Q7: C	Q17: C	Q27: C	Q37: A	Q47: A	Q57: C
Q8: D	Q18: D	Q28: B	Q38: B	Q48: B	Q58: D
Q9: A	Q19: C	Q29: C	Q39: C	Q49: A	Q59: A
Q10: D	Q20: D	Q30: D	Q40: B	Q50: B	Q60: B

Worked explanations for all 60 questions: quaidianpoint.com/alevel-biology-practice-test-19/