A-Level Biology Practice Test 6

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. Which organelle is the site of oxidative phosphorylation in a eukaryotic cell?

(A) Mitochondrion
(B) Golgi body
(C) Ribosome
(D) Lysosome

Q2. Which feature is present in a prokaryotic cell but absent from a typical eukaryotic cell?

(A) A nucleus enclosed by a double membrane
(B) Circular DNA free in the cytoplasm
(C) Membrane-bound mitochondria
(D) A cytoskeleton of protein fibres

Q3. Which structure is responsible for modifying, packaging and secreting proteins?

(A) Rough endoplasmic reticulum
(B) Smooth endoplasmic reticulum
(C) Golgi body
(D) Nucleolus

Biological molecules

Q4. Which bond joins two amino acids in a polypeptide?

(A) Hydrogen bond
(B) Ionic bond
(C) Glycosidic bond
(D) Peptide bond

Q5. Which polysaccharide is branched and used for energy storage in animals?

(A) Glycogen
(B) Cellulose
(C) Starch in amylopectin form only
(D) Chitin

Q6. A solution gives a purple colour in the biuret test. What does this indicate?

(A) Reducing sugar present
(B) Protein present
(C) Starch present
(D) Lipid present

Enzymes

Q7. A non-competitive inhibitor reduces the rate of an enzyme-catalysed reaction. What is its effect on Vmax and Km?

(A) Vmax increases, Km unchanged
(B) Vmax unchanged, Km increases
(C) Vmax decreases, Km unchanged
(D) Vmax unchanged, Km decreases

Q8. Why does increasing substrate concentration eventually stop increasing reaction rate?

(A) The enzyme is denatured
(B) The product inhibits the substrate
(C) The pH changes sharply
(D) All active sites become saturated

Q9. Which statement best describes the induced-fit model?

(A) The substrate changes the shape of the active site on binding
(B) The active site is rigid and exactly matches the substrate
(C) The enzyme is consumed during the reaction
(D) The product binds more tightly than the substrate

Cell membranes and transport

Q10. Which process moves ions against a concentration gradient using ATP?

(A) Simple diffusion
(B) Active transport
(C) Facilitated diffusion
(D) Osmosis

Q11. In the fluid mosaic model, what is the main function of cholesterol in animal cell membranes?

(A) To form channels for water
(B) To synthesise ATP
(C) To regulate membrane fluidity
(D) To bind to antigens

Q12. A red blood cell is placed in distilled water. What happens?

(A) It shrinks by plasmolysis
(B) It remains unchanged
(C) It loses water by active transport
(D) It swells and may burst

The mitotic cell cycle

Q13. During which phase of mitosis do sister chromatids separate?

(A) Anaphase
(B) Prophase
(C) Metaphase
(D) Telophase

Q14. What happens while the spindle assembly checkpoint remains unsatisfied during mitosis?

(A) DNA replication speeds up in all cells
(B) Anaphase is delayed until every chromosome is attached to spindle fibres
(C) The chromosome number doubles
(D) Cytokinesis is triggered directly

Q15. Which event occurs during interphase, before mitosis begins?

(A) Chromosomes line up on the equator
(B) The nuclear envelope breaks down
(C) DNA replicates
(D) Chromatids move to opposite poles

Nucleic acids and protein synthesis

Q16. Which base pairing occurs in DNA but not in RNA?

(A) Adenine with uracil
(B) Guanine with cytosine
(C) Cytosine with guanine
(D) Adenine with thymine

Q17. During translation, what is the role of tRNA?

(A) It carries a specific amino acid to the ribosome
(B) It copies DNA into mRNA
(C) It unwinds the DNA double helix
(D) It splices introns from pre-mRNA

Q18. Which feature of the genetic code means that several codons can code for the same amino acid?

(A) It is universal
(B) It is degenerate
(C) It is non-overlapping
(D) It has stop codons

Transport in plants

Q19. Which tissue transports sucrose from source to sink in a plant?

(A) Xylem vessels
(B) Cambium
(C) Phloem sieve tubes
(D) Epidermis

Q20. What drives the movement of water up the xylem in the cohesion-tension theory?

(A) Active pumping by root cells
(B) Osmosis into phloem
(C) Diffusion through stomata only
(D) Transpiration pull from leaves

Q21. Which adaptation reduces water loss from a xerophytic leaf?

(A) A thick waxy cuticle and sunken stomata
(B) Large, thin leaves with many stomata
(C) A reduced cuticle and open stomata
(D) Stomata only on the upper surface

Transport in mammals

Q22. Blood leaving the left ventricle during systole enters which vessel first?

(A) The pulmonary artery
(B) The aorta
(C) The vena cava
(D) The pulmonary vein

Q23. Why does fetal haemoglobin have a higher affinity for oxygen than adult haemoglobin?

(A) To release oxygen more easily in the lungs
(B) To carry more carbon dioxide
(C) To take up oxygen from maternal blood across the placenta
(D) To resist the Bohr effect

Q24. What happens to the atrioventricular valves during ventricular systole?

(A) They open to let blood into the atria
(B) They open to let blood into the arteries
(C) They remain open throughout
(D) They close to prevent backflow into the atria

Gas exchange

Q25. Which feature of alveoli best increases the rate of gas exchange?

(A) A large total surface area and thin walls
(B) A thick wall with a rich mucus layer
(C) A small surface area with slow blood flow
(D) A single large air sac with no capillaries

Q26. In fish, why does water flow over the gills in the opposite direction to blood flow?

(A) To reduce the surface area available
(B) To maintain a diffusion gradient along the whole lamella
(C) To slow oxygen uptake
(D) To prevent water entering the blood

Q27. Which organism exchanges gases through spiracles and tracheae?

(A) A fish
(B) A mammal
(C) An insect
(D) A flatworm

Infectious diseases

Q28. Why does cholera cause rapid dehydration even though Vibrio cholerae remains in the gut lumen?

(A) The bacterium invades red blood cells and destroys them
(B) A virus carried by the bacterium blocks kidney function
(C) Fungal spores in the gut absorb water from the blood
(D) A toxin released by the bacterium causes chloride ions and water to be secreted into the gut

Q29. Why are antibiotics ineffective against HIV?

(A) Antibiotics target bacterial structures, not viruses
(B) HIV has a cell wall that blocks antibiotics
(C) HIV replicates too slowly for antibiotics
(D) Antibiotics cannot enter human cells

Q30. Which statement about tuberculosis is correct?

(A) It is caused by a virus that attacks the liver
(B) It is caused by a bacterium spread in droplets from coughing
(C) It is caused by a fungus spread through food
(D) It is caused by a protoctist carried by mosquitoes

Immunity

Q31. Which cells produce antibodies in a specific immune response?

(A) Phagocytes
(B) Helper T cells only
(C) Plasma cells derived from B lymphocytes
(D) Red blood cells

Q32. What is the role of memory cells after a first infection?

(A) They destroy pathogens by phagocytosis immediately
(B) They produce histamine at the infection site
(C) They prevent antibodies from being made
(D) They allow a faster, stronger secondary response

Q33. Which process describes how phagocytes destroy a pathogen?

(A) They engulf it and digest it with lysosomal enzymes
(B) They release antibodies into the blood
(C) They present it directly to plasma cells
(D) They block its receptors with complement proteins

Energy and respiration

Q34. Where does the link reaction occur, and what does it produce?

(A) In the cytoplasm, producing pyruvate
(B) In the mitochondrial matrix, producing acetyl CoA and carbon dioxide
(C) On the cristae, producing water
(D) In the chloroplast stroma, producing glucose

Q35. How is most ATP made in aerobic respiration?

(A) By substrate-level phosphorylation in glycolysis only
(B) By photophosphorylation in the chloroplast
(C) By chemiosmosis using a proton gradient across the inner mitochondrial membrane
(D) By direct transfer from glucose to ADP

Q36. What is the respiratory quotient for a substrate that is pure carbohydrate?

(A) 0.7
(B) 0.8
(C) 1.3
(D) 1.0

Photosynthesis

Q37. Which products of the light-dependent reactions are used in the Calvin cycle?

(A) ATP and reduced NADP
(B) Oxygen and water
(C) Glucose and carbon dioxide
(D) ADP and NADP only

Q38. In the Calvin cycle, what is the first stable product of carbon fixation?

(A) Ribulose bisphosphate
(B) Glycerate 3-phosphate
(C) Triose phosphate
(D) Glucose

Q39. At very high light intensity, what is most likely to limit photosynthesis in a well-watered plant?

(A) Light intensity itself
(B) Chlorophyll concentration alone
(C) Carbon dioxide concentration
(D) Stomatal closure from darkness

Homeostasis

Q40. Which hormone increases water reabsorption in the collecting duct?

(A) Insulin
(B) Glucagon
(C) Adrenaline
(D) ADH

Q41. During ultrafiltration in the kidney, what forces fluid out of the glomerulus?

(A) High hydrostatic pressure in glomerular capillaries
(B) Active transport of glucose
(C) Osmosis into the Bowman’s capsule
(D) Secretion by podocytes

Q42. In negative feedback control of blood glucose, what happens when blood glucose rises?

(A) Glucagon secretion increases
(B) Insulin secretion increases and liver takes up glucose
(C) Insulin secretion falls and glycogen breaks down
(D) ADH secretion increases

Control and coordination

Q43. Which type of neurone carries impulses from a receptor to the central nervous system?

(A) Motor neurone
(B) Relay neurone
(C) Sensory neurone
(D) Effector neurone

Q44. After acetylcholine has triggered depolarisation at a cholinergic synapse, how is the signal switched off so the postsynaptic cell can respond again?

(A) Sodium channels close permanently
(B) Potassium ions are actively pumped out only
(C) Acetylcholine is stored in vesicles in the postsynaptic cell
(D) Acetylcholine is hydrolysed by acetylcholinesterase in the synaptic cleft into acetate and choline

Q45. Which plant hormone promotes cell elongation in shoots and phototropism?

(A) Auxin
(B) Abscisic acid
(C) Cytokinin
(D) Ethene

Inheritance

Q46. In a monohybrid cross between two heterozygotes, what is the expected phenotypic ratio?

(A) 1:2:1
(B) 3:1
(C) 9:3:3:1
(D) 1:1

Q47. A gene has alleles A and a with frequencies p and q. Under Hardy-Weinberg equilibrium, what is the frequency of heterozygotes?

(A) p squared
(B) q squared
(C) 2pq
(D) p plus q

Q48. Why do linked genes not show the expected 9:3:3:1 ratio in a dihybrid cross?

(A) They show codominance
(B) They are on different chromosomes
(C) They are always lethal in combination
(D) They are on the same chromosome and tend to be inherited together

Q49. In a dihybrid cross, a 9:7 phenotypic ratio is observed. What interaction does this show?

(A) Recessive epistasis
(B) Codominance
(C) Multiple alleles
(D) Sex linkage

Selection and evolution

Q50. Which type of selection favours individuals at both extremes of a trait?

(A) Stabilising selection
(B) Disruptive selection
(C) Directional selection
(D) Artificial selection only

Q51. What is the main requirement for allopatric speciation?

(A) A sudden doubling of chromosome number only
(B) Artificial selection by humans
(C) Reproductive isolation caused by geographical separation
(D) Identical selection pressures in both groups

Q52. Antibiotic resistance in bacteria spreads mainly because resistant bacteria are selected and then pass resistance genes on. Which process can transfer resistance between bacteria directly?

(A) Mitosis only
(B) Meiosis
(C) Binary fission of viruses
(D) Conjugation

Q53. Which evidence best supports evolution by natural selection in peppered moths?

(A) Dark moths increased where soot darkened tree bark
(B) Moths changed colour within their lifetime by choice
(C) Light moths were eaten only in clean areas
(D) Moth populations never changed over time

Classification, biodiversity and conservation

Q54. In the taxonomic hierarchy, which rank is immediately above genus?

(A) Species
(B) Family
(C) Order
(D) Kingdom

Q55. A high Simpson's index of diversity (D) indicates what about a community?

(A) Low species richness and dominance by one species
(B) Only one species present
(C) High species richness and even abundance
(D) No genetic diversity within species

Q56. Which conservation method keeps a species in its natural habitat?

(A) Captive breeding in a zoo
(B) Seed banks
(C) Frozen sperm banks
(D) A protected nature reserve

Q57. Why is molecular evidence now used alongside morphology in classification?

(A) DNA sequences reveal evolutionary relationships that appearance can hide
(B) Morphology is never useful
(C) DNA replaces the need for species names
(D) All organisms have identical DNA

Genetic technology

Q58. In PCR, what is the role of Taq polymerase?

(A) It cuts DNA at specific sequences
(B) It synthesises new DNA strands at high temperature
(C) It separates DNA fragments by size
(D) It inserts DNA into plasmids

Q59. In gel electrophoresis, one DNA sample produces bands close to the wells while another produces bands near the far end of the gel. What does this indicate about the two samples?

(A) The sample near the wells carries a positive charge
(B) The sample near the far end was not cut by restriction enzymes
(C) The sample near the wells contains larger fragments than the sample near the far end
(D) The sample near the far end contains more DNA in total

Q60. Which step is essential to make recombinant DNA using a plasmid vector?

(A) Heating DNA to denature it only
(B) Running the DNA on a gel only
(C) Amplifying the DNA by PCR only
(D) Cutting both plasmid and target DNA with the same restriction enzyme

Answer Key

Q1: A	Q11: C	Q21: A	Q31: C	Q41: A	Q51: C
Q2: B	Q12: D	Q22: B	Q32: D	Q42: B	Q52: D
Q3: C	Q13: A	Q23: C	Q33: A	Q43: C	Q53: A
Q4: D	Q14: B	Q24: D	Q34: B	Q44: D	Q54: B
Q5: A	Q15: C	Q25: A	Q35: C	Q45: A	Q55: C

Q6: B	Q16: D	Q26: B	Q36: D	Q46: B	Q56: D
Q7: C	Q17: A	Q27: C	Q37: A	Q47: C	Q57: A
Q8: D	Q18: B	Q28: D	Q38: B	Q48: D	Q58: B
Q9: A	Q19: C	Q29: A	Q39: C	Q49: A	Q59: C
Q10: B	Q20: D	Q30: B	Q40: D	Q50: B	Q60: D

Worked explanations for all 60 questions: quaidianpoint.com/alevel-biology-practice-test-6/