A-Level Biology Practice Test 15

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 statement about the rough endoplasmic reticulum is correct?

(A) It synthesises lipids and detoxifies drugs
(B) It is smooth because it lacks membranes
(C) It is studded with ribosomes and is involved in synthesis of proteins for secretion or membranes
(D) It is found only in prokaryotic cells

Q2. Which statement about the cytoskeleton is correct?

(A) It is a rigid wall outside the cell
(B) It is made of cellulose microfibrils only
(C) It is a network of protein fibres that supports the cell, moves organelles, and helps in cell division
(D) It prevents all movement inside the cell

Q3. A student measures a cell as 20 micrometres long in real life. In a drawing it is 40 mm long. What is the magnification?

(A) x2
(B) x20
(C) x200
(D) x2000

Biological molecules

Q4. Why is glycogen well suited as an energy store in animals?

(A) It is made of beta-glucose and is insoluble in water
(B) It is a structural polysaccharide in plant cell walls
(C) It is a storage polysaccharide in animals, made of alpha-glucose with frequent branching for rapid mobilisation
(D) It is a protein found in muscle only

Q5. Which statement about the structure of a phospholipid is correct?

(A) It is made of three fatty acids joined to glycerol
(B) It has two hydrophilic heads and one hydrophobic tail
(C) It has a hydrophilic phosphate head and two hydrophobic fatty acid tails
(D) It has no polar region at all

Q6. Which statement about hydrogen bonds in biological molecules is correct?

(A) They are strong covalent bonds within a molecule
(B) They occur only in water
(C) They are weak attractions between a hydrogen atom with a partial positive charge and an electronegative atom, important in water, DNA and proteins
(D) They join amino acids in a polypeptide chain

Enzymes

Q7. Which statement about enzyme denaturation is correct?

(A) Denaturation breaks peptide bonds and splits the enzyme into amino acids
(B) Denaturation increases enzyme activity
(C) Denaturation changes the tertiary structure and active site shape, usually irreversibly, without breaking peptide bonds
(D) Denaturation occurs only at low temperatures

Q8. Which statement about the effect of pH on enzyme activity is correct?

(A) All enzymes have the same optimum pH of 7
(B) pH affects only the substrate, never the enzyme
(C) Each enzyme has an optimum pH, and activity falls on either side as charges and bonds in the active site are affected
(D) Enzyme activity increases indefinitely as pH rises

Q9. An enzyme is immobilised for industrial use. Which advantage does this give?

(A) The enzyme can no longer catalyse any reaction
(B) The enzyme becomes denatured more quickly
(C) The enzyme can be reused and easily separated from the product
(D) The product becomes contaminated with enzyme in every batch

Cell membranes and transport

Q10. What is osmosis, in terms of water potential?

(A) Osmosis is the diffusion of solutes across a partially permeable membrane
(B) Osmosis requires ATP in all cases
(C) Osmosis is the diffusion of water from a higher water potential to a lower water potential across a partially permeable membrane
(D) Osmosis occurs only in animal cells

Q11. Which statement about active transport in root hair cells is correct?

(A) Water is taken up by active transport
(B) Mineral ions diffuse passively into roots at all concentrations
(C) Mineral ions are taken up against their concentration gradient using ATP
(D) Root hair cells have no mitochondria for ATP production

Q12. Which statement about exocytosis is correct?

(A) Molecules diffuse directly through the bilayer
(B) The cell membrane wraps around a particle to bring it inside
(C) Vesicles fuse with the cell surface membrane and release their contents outside the cell
(D) Vesicles move substances from the nucleus to the ribosomes

The mitotic cell cycle

Q13. Which statement about the cell cycle in cancer is correct?

(A) Cancer cells divide in a fully controlled way with normal checkpoints
(B) Cancer cells never undergo mitosis
(C) Cancer cells divide uncontrollably because checkpoint genes are mutated, allowing damaged cells to keep dividing
(D) Cancer is caused only by viruses and never by mutations

Q14. A cell in G1 has 8 chromosomes. How many chromatids are present in a single chromosome during metaphase of mitosis in this cell?

(A) 1
(B) 4
(C) 2
(D) 8

Q15. In a plant root tip, cells in the meristem divide repeatedly while cells further back elongate and specialise. What does this show about stem cells in plants?

(A) Meristem cells are fully specialised and cannot divide
(B) Meristem cells are found only in animals
(C) Meristem cells remain unspecialised, divide by mitosis, and their daughter cells differentiate
(D) Meristem cells have no nucleus

Q16. Which statement about the significance of mitosis in asexual reproduction is correct?

(A) It produces offspring with new gene combinations
(B) It halves the chromosome number in offspring
(C) It produces offspring genetically identical to the parent, which is advantageous in a stable environment
(D) It requires two parents

Nucleic acids and protein synthesis

Q17. Which statement about the structure of DNA is correct?

(A) Its strands run parallel in the same direction
(B) It is a single helix with bases on the outside
(C) Its backbone is made of amino acids
(D) It is a double helix with sugar-phosphate backbones on the outside and bases paired inside

Q18. Which statement about mRNA is correct?

(A) mRNA remains in the nucleus throughout translation
(B) mRNA carries amino acids to ribosomes
(C) mRNA is double-stranded and contains thymine
(D) mRNA carries the genetic code from the nucleus to ribosomes in the cytoplasm

Q19. Which statement about the genetic code is correct?

(A) It is overlapping, so each base belongs to several codons
(B) It uses four-base codons in eukaryotes
(C) It varies completely between species
(D) It is non-overlapping, with each base belonging to only one codon, and it is read in triplets

Q20. A mutation substitutes one base in a codon, but the amino acid produced stays the same. What explains this?

(A) The mutation occurred in an intron
(B) The ribosome corrects all substitutions
(C) The mutation was a frameshift
(D) The genetic code is degenerate, so a different codon can specify the same amino acid

Transport in plants

Q21. In a plant, water moves from roots to leaves while sugars move from leaves to roots at the same time. Which pair of tissues carries these two flows?

(A) Xylem transports sugars and phloem transports water
(B) Xylem is living tissue and phloem is dead tissue
(C) Both tissues transport only water
(D) Xylem transports water and mineral ions upwards, while phloem transports assimilates from sources to sinks

Q22. Which statement about the cohesion of water is correct?

(A) Cohesion is attraction between water molecules and the walls of xylem vessels
(B) Cohesion prevents water from evaporating from leaves
(C) Cohesion is the active pumping of water by roots
(D) Cohesion is attraction between water molecules due to hydrogen bonding, helping to maintain a continuous column

Q23. A plant is placed in a humid, still environment. What happens to transpiration and to water uptake?

(A) Transpiration increases and water uptake increases
(B) Transpiration decreases and water uptake increases
(C) Transpiration stays the same but water uptake stops
(D) Transpiration decreases because the water vapour gradient is smaller, so water uptake also decreases

Q24. Which statement about loading at a source is correct?

(A) Water leaves the phloem at the source, lowering pressure
(B) Sucrose is unloaded at sources and loaded at sinks
(C) Loading requires no energy at any stage
(D) Sucrose is loaded into sieve tubes, lowering water potential there and drawing water in by osmosis, which raises hydrostatic pressure

Transport in mammals

Q25. Which statement about the cardiac cycle is correct?

(A) The atria and ventricles contract at exactly the same time
(B) The heart rests during atrial systole
(C) The ventricles contract first, then the atria
(D) The atria contract first, pushing blood into the ventricles, then the ventricles contract to pump blood out

Q26. Which statement about oxygen dissociation curves is correct?

(A) A curve shifted to the right shows a higher affinity for oxygen
(B) The curve shows oxygen uptake against temperature
(C) All respiratory pigments have identical curves
(D) A curve shifted to the right shows a lower affinity, so oxygen is released more readily

Q27. Which statement about lymph is correct?

(A) Lymph is produced only in the liver
(B) Lymph is blood that has left the capillaries permanently
(C) Lymph carries oxygen to tissues
(D) Lymph is tissue fluid that has entered lymph vessels and is returned to the blood near the heart

Gas exchange

Q28. Which statement about the ventilation of a mammal during exercise is correct?

(A) Only the diaphragm contracts, with no change in rate
(B) Rate increases but depth decreases so total ventilation stays the same
(C) Breathing stops to conserve energy
(D) Both rate and depth of breathing increase to meet higher oxygen demand and remove carbon dioxide

Q29. Which statement about gill lamellae is correct?

(A) Lamellae are found only in mammals
(B) Lamellae decrease surface area to reduce water loss
(C) Lamellae are thick and muscular
(D) Lamellae increase surface area and have a rich blood supply and thin walls for efficient diffusion

Q30. Which statement about the tracheoles of an insect is correct?

(A) Tracheoles are air-filled tubes that end close to cells and may contain fluid that is withdrawn during activity to shorten the diffusion distance
(B) Tracheoles carry blood to the tissues
(C) Tracheoles are found only in aquatic insects
(D) Tracheoles open directly to the outside through the mouth

Infectious diseases

Q31. Which statement about the treatment of bacterial infections is correct?

(A) Antibiotics kill bacteria or prevent their growth, but they do not work against viruses
(B) Antibiotics work equally well against viruses and bacteria
(C) Antibiotics are effective only if taken for one day
(D) Antibiotics strengthen viruses

Q32. Which statement about cholera treatment is correct?

(A) The priority is replacing lost water and salts with oral rehydration solution
(B) The priority is giving antibiotics alone, with no fluids
(C) Cholera cannot be treated at all
(D) Treatment involves removing the small intestine

Q33. Which statement about the human immunodeficiency virus is correct?

(A) HIV infects and destroys helper T cells, progressively weakening cell-mediated immunity
(B) HIV infects only red blood cells
(C) HIV is a bacterium that can be killed by antibiotics
(D) HIV infection always causes immediate symptoms and death

Immunity

Q34. Which statement about phagocytes is correct?

(A) Phagocytes are part of the non-specific immune response and engulf pathogens
(B) Phagocytes produce antibodies
(C) Phagocytes are found only in the blood, never in tissues
(D) Phagocytes form memory cells

Q35. Which statement about the structure of an antibody is correct?

(A) An antibody has a variable region that binds antigen and a constant region that determines its class and function
(B) An antibody is a single polypeptide chain with no variable region
(C) An antibody binds antigen with its constant region
(D) All antibodies have the same variable region

Q36. Which statement about natural passive immunity is correct?

(A) Antibodies are passed from mother to child across the placenta and in breast milk
(B) The child produces its own antibodies after vaccination
(C) Antibodies are injected by a doctor
(D) Passive immunity lasts for life

Energy and respiration

Q37. Where does the Krebs cycle take place, and what are its main products?

(A) It occurs in the cytoplasm and produces glucose
(B) It produces most of the ATP of aerobic respiration directly
(C) It uses oxygen directly to make water
(D) It occurs in the mitochondrial matrix, oxidises acetyl groups, and produces reduced coenzymes and carbon dioxide

Q38. Which statement about chemiosmosis is correct?

(A) ATP is made when protons diffuse down their gradient through ATP synthase in the inner mitochondrial membrane
(B) ATP is made when electrons diffuse through ATP synthase
(C) Chemiosmosis occurs only in chloroplasts
(D) Chemiosmosis requires no membrane at all

Q39. Which statement about anaerobic respiration is correct?

(A) It produces much more ATP than aerobic respiration
(B) It produces less ATP because glucose is only partly broken down, but it allows ATP production without oxygen
(C) It produces water as its main product
(D) It occurs only in yeast, never in animals

Photosynthesis

Q40. Which statement about the light-dependent stage is correct?

(A) It occurs in the stroma and fixes carbon dioxide
(B) It occurs in the thylakoid membranes, splits water, and produces ATP and reduced NADP
(C) It produces glucose directly
(D) It occurs only in the dark

Q41. How does a limiting factor control the rate of photosynthesis?

(A) The rate of photosynthesis is always limited by light intensity alone
(B) The factor in shortest supply relative to need limits the rate, and increasing it increases the rate until another factor limits
(C) Increasing a limiting factor always increases the rate indefinitely
(D) Temperature never limits photosynthesis

Q42. Which statement about triose phosphate is correct?

(A) Triose phosphate is the first stable product of carbon fixation
(B) Triose phosphate is produced in the Calvin cycle and can be used to make sugars, amino acids and lipids, or to regenerate RuBP
(C) Triose phosphate is produced only in the light-dependent stage
(D) Triose phosphate is a pigment

Homeostasis

Q43. Which statement about negative feedback is correct?

(A) A change triggers a response that amplifies the change further
(B) A change triggers a response that reverses the change and restores the set point
(C) Negative feedback occurs only in blood glucose control
(D) Negative feedback always involves hormones, never nerves

Q44. Which statement about the kidney is correct?

(A) The kidney filters blood in the glomerulus and selectively reabsorbs useful substances in the tubules
(B) The kidney produces urine by filtering the whole blood, including cells and proteins
(C) The kidney stores glucose for later use
(D) The kidney produces red blood cells only

Q45. Which statement about the control of core temperature is correct?

(A) In cold conditions, shivering and vasoconstriction help raise or conserve core temperature
(B) In cold conditions, sweating and vasodilation help conserve heat
(C) In hot conditions, shivering helps cool the body
(D) Temperature receptors are found only in the skin

Control and coordination

Q46. Which statement about the transmission of a nerve impulse along an axon is correct?

(A) The impulse is an electrical current flowing inside the axon like in a wire
(B) The impulse is a wave of depolarisation and repolarisation travelling along the membrane
(C) The impulse travels by diffusion of neurotransmitter along the axon
(D) The impulse travels only in myelinated neurones

Q47. Which statement about the eye is correct?

(A) Light is refracted mainly by the cornea and lens and focused onto the retina
(B) Light is focused onto the blind spot for sharpest vision
(C) The retina is at the front of the eye
(D) The iris produces the image

Q48. Which statement about tropisms is correct?

(A) Tropisms are rapid movements of a whole plant towards a stimulus
(B) Tropisms are growth responses to a directional stimulus, such as light or gravity
(C) Tropisms occur only in roots
(D) Tropisms are controlled by nerve impulses

Inheritance

Q49. Which statement about alleles is correct?

(A) Alleles are different forms of the same gene, occupying the same locus on homologous chromosomes
(B) Alleles are different genes on different chromosomes
(C) Alleles are proteins produced by a gene
(D) An organism can have only one allele of each gene

Q50. Which statement about the inheritance of cystic fibrosis is correct?

(A) It is caused by a dominant allele on an autosome

(B) It is caused by a recessive allele on an autosome, so both parents of an affected child are usually carriers

(C) It is caused by a recessive allele on the X chromosome

(D) It is not inherited at all

Q51. Which statement about independent assortment is correct?

(A) Alleles of genes on the same chromosome always assort independently

(B) During metaphase I, homologous chromosome pairs line up independently, so alleles of genes on different chromosomes assort independently

(C) Independent assortment occurs only in mitosis

(D) Independent assortment prevents any genetic variation

Selection and evolution

Q52. Over many generations, a population of moths shifts from mostly light-coloured to mostly dark-coloured after industrial pollution darkens tree bark. Which statement best describes this change?

(A) Allele frequencies in the population changed because dark moths survived and reproduced more successfully

(B) Individual moths changed colour during their lifetimes and passed the change on

(C) Evolution occurred only when a new moth species formed

(D) The population progressed towards a perfect form

Q53. Which statement about the Hardy-Weinberg equation is correct?

(A) In the equation p squared plus 2pq plus q squared equals 1, p squared is the frequency of heterozygotes

(B) In the equation, 2pq is the frequency of heterozygotes, and p squared and q squared are the frequencies of the two homozygotes

(C) The equation can only be used when one allele is dominant

(D) The equation measures mutation rate directly

Q54. Which statement about natural selection and antibiotic resistance is correct?

(A) Bacteria become resistant because they need to survive

(B) Resistant bacteria survive antibiotic treatment and reproduce, passing resistance alleles to their offspring

(C) Antibiotics insert resistance genes into bacteria

(D) Resistance is acquired by individual bacteria during treatment and lost afterwards

Classification, biodiversity and conservation

Q55. Which statement about classification is correct?

(A) Classification groups organisms by evolutionary relationships, so closely related organisms share a recent common ancestor

(B) Classification is based only on where organisms live

(C) Classification never changes as new evidence appears

(D) All organisms in the same kingdom are equally closely related

Q56. Which statement about biodiversity is correct?

(A) Biodiversity refers only to the number of species in an area
(B) Biodiversity includes genetic diversity, species diversity and ecosystem diversity
(C) Biodiversity is the same in every habitat
(D) Biodiversity cannot be measured

Q57. Which statement about conservation is correct?

(A) Conservation aims only to preserve individual animals in zoos
(B) Conservation aims to maintain biodiversity and ecosystem function, using both in situ and ex situ methods
(C) Conservation prevents all human use of natural resources
(D) Conservation is needed only for species that are already extinct

Genetic technology

Q58. What does the polymerase chain reaction achieve, and how does it do it?

(A) PCR amplifies a specific DNA sequence by repeated cycles of denaturation, annealing and extension
(B) PCR translates DNA into protein
(C) PCR requires a living cell
(D) PCR separates DNA fragments by size

Q59. Which statement about genetic modification is correct?

(A) Genetic modification always involves adding genes from the same species only
(B) Genetic modification involves altering the genetic material of an organism, which may include adding a gene from another species
(C) Genetic modification changes an organism without changing its DNA
(D) Genetic modification is the same as selective breeding

Q60. Which statement about the ethical issues of genetic technology is correct?

(A) There are no ethical issues associated with genetic technology
(B) Issues include consent for genetic testing, ownership of genetic information, and the safety of releasing genetically modified organisms
(C) Genetic technology is banned in all countries
(D) Ethical issues apply only to plants, never to humans

Answer Key

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

Q9: C	Q19: D	Q29: D	Q39: B	Q49: A	Q59: B
Q10: C	Q20: D	Q30: A	Q40: B	Q50: B	Q60: B

Worked explanations for all 60 questions: quaidianpoint.com/alevel-biology-practice-test-15/