A-Level Biology Practice Test 5

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. A muscle cell contains many mitochondria, while a skin cell contains far fewer. Why does this difference make functional sense?

(A) The chloroplast is the site of aerobic respiration
(B) Mitochondria are the site of aerobic respiration, producing ATP needed for muscle contraction
(C) The Golgi apparatus produces most ATP
(D) The nucleus produces most ATP

Q2. What is the function of the cell surface membrane?

(A) It synthesises proteins
(B) It stores starch
(C) It carries out photosynthesis
(D) It controls entry and exit of substances

Q3. Which structure joins plant cells for communication?

(A) Plasmodesmata
(B) Tight junctions
(C) Desmosomes only
(D) Gap junctions in plants

Biological molecules

Q4. Which polysaccharide forms plant cell walls?

(A) Glycogen
(B) Starch
(C) Cellulose
(D) Chitin

Q5. What is a peptide bond?

(A) A bond between sugars
(B) A bond between fatty acids and glycerol
(C) A bond between amino acids formed by condensation
(D) A bond between nucleotides

Q6. Which molecule has a hydrophilic head and hydrophobic tails?

(A) A phospholipid
(B) A triglyceride
(C) A disaccharide
(D) An amino acid

Enzymes

Q7. What is activation energy?

(A) Energy released by a reaction
(B) Energy stored in ATP only
(C) Energy of the products
(D) Energy needed to start a reaction

Q8. Which statement about enzyme inhibitors is correct?

(A) Non-competitive inhibitors increase Vmax
(B) Competitive inhibitors bind the active site
(C) All inhibitors denature enzymes
(D) Inhibitors are always permanent

Q9. What is the optimum temperature for most human enzymes?

(A) Around 0 degrees Celsius
(B) Around 100 degrees Celsius
(C) Around 20 degrees Celsius
(D) Around 37 degrees Celsius

Cell membranes and transport

Q10. Which process requires a carrier protein and ATP?

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

Q11. What is the function of aquaporins?

(A) They pump ions against a gradient
(B) They allow rapid water movement across membranes
(C) They synthesise ATP
(D) They carry glucose only

Q12. A single-celled organism relies on diffusion for gas exchange, but a large multicellular animal cannot. Why does size matter for diffusion?

(A) Large organisms have a small surface area to volume ratio and long diffusion distances, so diffusion alone is too slow
(B) Diffusion requires ATP in large animals
(C) Diffusion only occurs in gases in large animals
(D) Diffusion moves substances against a gradient in large animals

The mitotic cell cycle

Q13. What is interphase?

(A) The period of growth and DNA replication between divisions
(B) The stage of chromosome separation
(C) The stage of cytokinesis only
(D) A type of meiosis

Q14. Which event occurs in prophase?

(A) Chromatids separate
(B) Chromosomes condense and the nuclear envelope breaks down
(C) Chromosomes align at the equator
(D) Two nuclei form

Q15. What is the result of mitosis?

(A) Four haploid cells
(B) Two genetically different cells
(C) Two genetically identical diploid daughter cells
(D) One cell with double chromosomes

Nucleic acids and protein synthesis

Q16. Which nitrogenous base is found in RNA but not DNA?

(A) Thymine
(B) Adenine
(C) Guanine
(D) Uracil

Q17. What is translation?

(A) Synthesis of mRNA from DNA
(B) Replication of DNA
(C) Splicing of pre-mRNA
(D) Synthesis of a polypeptide from an mRNA template

Q18. A mutation changes one base in a DNA sequence, altering the amino acid sequence of the resulting polypeptide. Which level of organisation was directly changed by the mutation?

(A) A gene, a sequence of DNA coding for a polypeptide or functional RNA
(B) A whole chromosome
(C) A protein only
(D) A type of ribosome

Transport in plants

Q19. Which tissue in a leaf is the main site of photosynthesis?

(A) Epidermis
(B) Xylem
(C) Palisade mesophyll
(D) Phloem

Q20. What is the function of stomata?

(A) They absorb water from soil
(B) They allow gas exchange and control water loss
(C) They transport sucrose
(D) They support the leaf

Q21. Which factor reduces transpiration on a cloudy day?

(A) Higher wind speed
(B) Lower light intensity closing stomata partly
(C) Lower humidity
(D) Higher temperature

Transport in mammals

Q22. What is the function of capillaries?

(A) Carrying blood at high pressure
(B) Returning blood to the heart
(C) Exchange of materials between blood and tissues
(D) Preventing backflow

Q23. What is lymph?

(A) Tissue fluid drained into lymph vessels
(B) Blood plasma in arteries
(C) Fluid inside red blood cells
(D) Fluid in the kidney tubules

Q24. Which heart valve prevents backflow into the left atrium?

(A) The tricuspid valve
(B) The semilunar valve
(C) The pulmonary valve
(D) The bicuspid valve

Gas exchange

Q25. What is the breathing centre controlled by?

(A) Oxygen concentration only
(B) Heart rate only
(C) Carbon dioxide concentration in the blood
(D) Blood glucose level

Q26. Which structure increases surface area for gas exchange in lungs?

(A) Bronchi
(B) Trachea
(C) Diaphragm
(D) Alveoli

Q27. Why is carbon monoxide dangerous?

(A) It destroys alveoli
(B) It binds haemoglobin more strongly than oxygen
(C) It blocks the trachea
(D) It prevents ventilation

Infectious diseases

Q28. Which pathogen is a fungus that causes disease in humans?

(A) A dermatophyte causing ringworm is one example
(B) Vibrio cholerae
(C) Plasmodium
(D) HIV

Q29. What is the incubation period?

(A) Time between infection and symptom appearance
(B) Time to cure a disease
(C) Time a vaccine lasts
(D) Time between vaccinations

Q30. Which practice reduces spread of respiratory infections?

(A) Sharing towels
(B) Increasing crowding
(C) Stopping hand washing
(D) Covering coughs and improving ventilation

Immunity

Q31. What is clonal selection?

(A) Random production of antibodies
(B) Division of phagocytes only
(C) Activation of lymphocytes with receptors matching an antigen
(D) Production of all antibodies by one cell

Q32. What is a memory cell?

(A) A cell that stores antibodies forever
(B) A long-lived lymphocyte that allows a rapid secondary response
(C) A phagocyte that never divides
(D) A cell that produces antigens

Q33. Which type of immunity is provided by breastfeeding?

(A) Natural active immunity
(B) Natural passive immunity
(C) Artificial active immunity
(D) Artificial passive immunity

Energy and respiration

Q34. What is glycolysis?

(A) Breakdown of glucose to pyruvate in the cytoplasm
(B) Breakdown of pyruvate in mitochondria
(C) Synthesis of glucose
(D) Fixation of carbon dioxide

Q35. What is the role of NAD in respiration?

(A) It synthesises ATP directly
(B) It fixes carbon dioxide
(C) It splits water
(D) It carries hydrogen to the electron transport chain

Q36. Which stage produces most ATP in aerobic respiration?

(A) Glycolysis
(B) The link reaction
(C) Oxidative phosphorylation
(D) Anaerobic fermentation

Photosynthesis

Q37. What is the light-independent stage also called?

(A) Photolysis
(B) Chemiosmosis
(C) Glycolysis
(D) The Calvin cycle

Q38. Which enzyme catalyses carbon fixation?

(A) ATP synthase
(B) Rubisco
(C) DNA polymerase
(D) Amylase

Q39. What is the product of the Calvin cycle used to make starch?

(A) Triose phosphate
(B) Glycerate 3-phosphate only
(C) Oxygen
(D) Water

Q40. How many turns of the Calvin cycle fix six carbon dioxide molecules to make one glucose equivalent?

(A) One turn
(B) Three turns
(C) Six turns
(D) Twelve turns

Homeostasis

Q41. What is the role of the distal convoluted tubule?

(A) It filters blood
(B) It produces urine directly
(C) It adjusts salt and water reabsorption under hormonal control
(D) It stores urine

Q42. A person becomes dehydrated after sweating heavily. Blood water potential falls. Which hormonal response helps restore water balance?

(A) Insulin release increases
(B) ADH release increases, increasing water reabsorption in the kidney
(C) Glucagon release increases
(D) Adrenaline release increases

Q43. What is diabetes insipidus?

(A) A condition with high insulin
(B) A condition with low glucagon
(C) A condition with excess ADH
(D) A condition with low ADH leading to large volumes of dilute urine

Q44. Which mechanism controls body temperature?

(A) Negative feedback involving receptors, coordination centres and effectors
(B) Positive feedback only
(C) Hormonal control only
(D) Behavioural responses only

Control and coordination

Q45. What is the function of a motor neurone?

(A) It carries impulses to an effector
(B) It carries impulses from a receptor
(C) It connects sensory and motor neurones
(D) It detects stimuli

Q46. What is summation at a synapse?

(A) A single signal always triggering an impulse
(B) Blocking of all signals
(C) Combined excitatory signals reaching threshold to trigger an impulse
(D) Reversal of an impulse

Q47. What is the role of acetylcholinesterase?

(A) It synthesises acetylcholine
(B) It opens sodium channels permanently
(C) It transports acetylcholine into vesicles
(D) It breaks down acetylcholine in the synaptic cleft

Q48. Which plant hormone inhibits growth and promotes leaf fall?

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

Inheritance

Q49. What is sex linkage?

(A) Inheritance of genes on autosomes only
(B) Inheritance of genes on sex chromosomes
(C) Inheritance through mitochondria only
(D) Inheritance of dominant genes only

Q50. What is a carrier?

(A) A person with a dominant disorder
(B) A person with two recessive alleles
(C) A person who cannot pass on alleles
(D) A heterozygote for a recessive disorder who shows no symptoms

Q51. What is crossing over?

(A) Separation of sister chromatids
(B) Replication of DNA
(C) Exchange of genetic material between homologous chromosomes
(D) Fusion of gametes

Selection and evolution

Q52. What is an adaptation?

(A) An inherited feature that increases survival and reproduction
(B) A learned behaviour only
(C) A mutation that always harms
(D) A temporary change in phenotype

Q53. Which statement about evolution is correct?

(A) Individuals evolve during their lifetime
(B) Evolution always increases complexity
(C) Evolution has a goal
(D) Populations evolve, not individual organisms

Q54. What is the founder effect?

(A) Reduced genetic diversity when a small group starts a new population
(B) Increased diversity from migration
(C) Selection for founders only
(D) Extinction of a population

Classification, biodiversity and conservation

Q55. What is habitat fragmentation?

(A) Creating a new habitat
(B) Breaking a habitat into isolated patches
(C) Increasing habitat size
(D) Protecting a habitat completely

Q56. Which international agreement aims to protect biodiversity?

(A) The Kyoto Protocol only
(B) A local planning law only
(C) The Convention on Biological Diversity
(D) A fishing quota only

Q57. What is an endemic species?

(A) A species found only in one location
(B) A species found worldwide
(C) An extinct species
(D) An introduced species

Genetic technology

Q58. What is recombinant DNA technology?

(A) Cloning by selective breeding
(B) Natural mutation only
(C) Combining DNA from different sources to create new genetic combinations
(D) Sequencing DNA only

Q59. What is the role of a promoter in genetic engineering?

(A) It cuts DNA
(B) It controls expression of an inserted gene
(C) It joins DNA fragments
(D) It amplifies DNA

Q60. What is a transgenic organism?

(A) An organism produced by inbreeding
(B) An organism with a natural mutation
(C) An organism grown in tissue culture only
(D) An organism containing foreign DNA from another species

Answer Key

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

Worked explanations for all 60 questions: quaidianpoint.com/alevel-biology-practice-test-5/