A-Level Biology Practice Test 2

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 structure is present in plant cells but absent from animal cells?

(A) A mitochondrion
(B) A chloroplast
(C) A ribosome
(D) A Golgi apparatus

Q2. A cell with a very high rate of protein synthesis has a particularly large nucleolus. Why does this correlation make sense?

(A) It stores starch grains for energy
(B) It controls entry through nuclear pores
(C) It synthesises ATP for the cell
(D) It produces ribosomal RNA and assembles ribosome subunits needed for protein synthesis

Q3. Which organelle contains enzymes that break down worn-out organelles inside a cell?

(A) The lysosome, with hydrolytic enzymes
(B) The ribosome, for lipid synthesis
(C) The smooth endoplasmic reticulum, for protein synthesis
(D) The mitochondrion, for photosynthesis

Biological molecules

Q4. Which carbohydrate is the main storage polysaccharide in animals?

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

Q5. Why do unsaturated fatty acids have lower melting points than saturated fatty acids?

(A) They have longer carbon chains
(B) They contain glycerol only
(C) Double bonds create kinks that prevent tight packing
(D) They form more hydrogen bonds

Q6. What is formed when two amino acids join by condensation?

(A) A dipeptide and water
(B) A disaccharide and water
(C) A triglyceride and glycerol
(D) A nucleotide and phosphate

Enzymes

Q7. A competitive inhibitor is added to an enzyme reaction. What happens to Km?

(A) Km decreases because affinity rises
(B) Vmax decreases permanently
(C) The optimum pH changes to neutral
(D) Km increases because more substrate is needed for half Vmax

Q8. Which statement about enzyme specificity is correct?

(A) All enzymes act on glucose
(B) An enzyme catalyses only reactions of substrates fitting its active site
(C) Enzymes are unchanged by pH
(D) Enzymes work equally well on any similar molecule

Q9. Why does a protease denatured by strong acid lose activity?

(A) Its peptide bonds are used as substrate
(B) It becomes a competitive inhibitor
(C) Its substrate concentration falls
(D) Its tertiary structure changes, altering the active site

Cell membranes and transport

Q10. Which molecule increases membrane fluidity at low temperatures?

(A) Glycoprotein
(B) Cellulose
(C) Cholesterol prevents tight packing of phospholipids
(D) Starch

Q11. Which process moves large molecules out of a cell in vesicles?

(A) Facilitated diffusion
(B) Exocytosis
(C) Osmosis
(D) Active transport through a channel

Q12. A plant cell in a concentrated sucrose solution becomes plasmolysed. What has happened?

(A) Water left the vacuole by osmosis and the membrane pulled away from the wall
(B) Water entered by osmosis
(C) The cell wall dissolved
(D) Sucrose entered by active transport

Q13. Which statement about facilitated diffusion is correct?

(A) It uses channel or carrier proteins but requires no ATP
(B) It moves substances against a gradient using ATP
(C) It only transports water
(D) It requires vesicle formation

The mitotic cell cycle

Q14. What happens during the S phase of interphase?

(A) Chromosomes separate
(B) DNA replicates
(C) Cytokinesis occurs
(D) Spindle fibres form

Q15. Which statement about stem cells is correct?

(A) They cannot divide after birth
(B) They are only found in plants
(C) They can divide and differentiate into specialised cells
(D) They always divide by meiosis

Q16. What is the role of telomeres?

(A) They code for spindle proteins
(B) They trigger cytokinesis
(C) They attach chromatids to the spindle
(D) They protect chromosome ends from shortening during replication

Q17. During metaphase, chromosomes align at which position?

(A) The poles of the cell
(B) Inside the nucleus only
(C) At the cell membrane
(D) The equator of the cell

Nucleic acids and protein synthesis

Q18. Which base pairing occurs in DNA?

(A) Adenine pairs with thymine
(B) Adenine pairs with uracil
(C) Guanine pairs with adenine
(D) Cytosine pairs with thymine

Q19. What is the function of mRNA?

(A) It carries amino acids
(B) It forms part of the ribosome structure
(C) It carries the genetic code from the nucleus to the ribosome
(D) It unwinds DNA

Q20. In the lac operon, what happens when lactose is present?

(A) The repressor binds the operator permanently
(B) The repressor is inactivated and transcription proceeds
(C) RNA polymerase is destroyed
(D) The structural genes are deleted

Q21. Which mutation is most likely to alter a protein significantly?

(A) A silent substitution in the third base of a codon
(B) A frameshift mutation from a base insertion
(C) A substitution that codes for the same amino acid
(D) A mutation in a non-coding region

Transport in plants

Q22. Which tissue transports sucrose in a plant?

(A) Xylem
(B) Cortex
(C) Phloem
(D) Epidermis

Q23. What is the effect of high humidity on transpiration rate?

(A) It decreases transpiration
(B) It increases transpiration
(C) It has no effect
(D) It stops photosynthesis

Q24. Which feature helps a leaf reduce water loss?

(A) A large number of open stomata in bright light
(B) Thin leaves with no cuticle
(C) Stomata on the upper surface only
(D) A thick waxy cuticle

Transport in mammals

Q25. Which chamber of the heart has the thickest muscle wall?

(A) The right atrium
(B) The left atrium
(C) The left ventricle
(D) The right ventricle

Q26. Blood pressure in the aorta is about 120 mmHg during systole and falls to about 80 mmHg during diastole, yet capillary flow remains steady. Which arterial feature most directly explains this smoothing?

(A) Arteries allow exchange with tissues
(B) Arteries carry blood at uniformly low pressure
(C) Arteries prevent backflow only, using valves
(D) Arteries have thick elastic walls that stretch and recoil, maintaining pressure between heartbeats

Q27. What is the function of valves in veins?

(A) To increase blood pressure
(B) To prevent backflow of blood
(C) To filter blood
(D) To carry oxygenated blood

Gas exchange

Q28. Which structure in insects is the site of gas exchange with tissues?

(A) Tracheoles
(B) Spiracles only
(C) Alveoli
(D) Gills

Q29. A spirometer trace shows lung volume rising sharply over two seconds. Which muscle action is occurring at that moment?

(A) The diaphragm contracts and flattens, and the external intercostal muscles contract to raise the ribs
(B) The diaphragm relaxes and domes upwards
(C) All respiratory muscles stop moving
(D) The diaphragm pushes air out of the lungs

Q30. Why is the oxygen dissociation curve for myoglobin to the left of haemoglobin?

(A) Myoglobin carries four oxygen molecules
(B) Myoglobin releases oxygen more easily
(C) Myoglobin is found in blood plasma
(D) Myoglobin has a higher affinity for oxygen

Infectious diseases

Q31. A traveller returning from a tropical region develops recurring fever and anaemia. Blood tests show parasites inside red blood cells. Which organism is the most likely cause?

(A) Vibrio cholerae
(B) Mycobacterium tuberculosis
(C) Plasmodium, a protoctist
(D) Human immunodeficiency virus

Q32. How does tuberculosis spread between people?

(A) Through contaminated water only
(B) Through airborne droplets from coughing
(C) Through insect bites
(D) Through sexual contact only

Q33. Which measure best reduces cholera transmission?

(A) Vaccinating against viruses only
(B) Providing clean water and sanitation
(C) Increasing antibiotic use in healthy people
(D) Isolating all patients permanently

Immunity

Q34. What is the role of phagocytes in immunity?

(A) They engulf and digest pathogens
(B) They produce antibodies
(C) They form memory cells only
(D) They activate B cells directly by secreting antibodies

Q35. A person recovers from chickenpox and is unlikely to develop it again. Which feature of their immune system provides this long-term protection?

(A) Immunity from injected antibodies
(B) Immunity that lasts only a few weeks
(C) Immunity inherited from a parent
(D) Memory cells produced after exposure to an antigen, giving a rapid response on re-exposure

Q36. Why does a vaccine need to contain an antigen, rather than simply injecting antibodies, to give long-lasting protection?

(A) It injects ready-made antibodies for long-term protection
(B) It prevents all infections permanently
(C) An antigen triggers the person's own immune response and memory cell formation
(D) It works only against bacteria

Energy and respiration

Q37. Where does glycolysis occur?

(A) In the mitochondrial matrix
(B) On the inner mitochondrial membrane
(C) In the nucleus
(D) In the cytoplasm

Q38. How many ATP molecules are produced per glucose by substrate-level phosphorylation in glycolysis alone, net?

(A) 4 ATP
(B) 2 ATP
(C) 32 ATP
(D) 0 ATP

Q39. Why does anaerobic respiration in muscle produce less ATP than aerobic respiration?

(A) Glucose is only partly broken down to lactate
(B) No ATP is produced at all
(C) Oxygen is used in glycolysis
(D) Lactate contains no energy

Photosynthesis

Q40. Where do the light-dependent reactions occur?

(A) In the stroma
(B) In the cytoplasm
(C) On the thylakoid membranes
(D) On the mitochondrial cristae

Q41. What is the first stable product of carbon fixation in C3 plants?

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

Q42. Why does photosynthesis slow at very high temperatures?

(A) Chlorophyll is destroyed instantly
(B) Enzymes in the Calvin cycle denature
(C) Light intensity always falls
(D) Stomata open wider

Homeostasis

Q43. Which process returns most glucose to the blood in the kidney?

(A) Ultrafiltration in the glomerulus
(B) Secretion in the collecting duct
(C) Filtration in the loop of Henle
(D) Selective reabsorption in the proximal convoluted tubule

Q44. Blood glucose rises after a meal, insulin is released, and glucose levels fall back toward normal. Which type of control system is this an example of?

(A) Negative feedback, which reverses a change to restore a set point
(B) Positive feedback, which amplifies a change
(C) A system that stops all hormone secretion
(D) A system that only operates in the kidney

Q45. Which hormone is released when blood glucose rises after a meal?

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

Control and coordination

Q46. A touch receptor in the skin is stimulated. Which neurone carries the impulse first, toward the spinal cord?

(A) A motor neurone
(B) A relay neurone only
(C) A sensory neurone
(D) An effector neurone

Q47. What is the resting potential of a neurone maintained by?

(A) Opening of all sodium channels
(B) Continuous action potentials
(C) Myelin alone
(D) The sodium-potassium pump and differential permeability

Q48. Which plant hormone promotes cell elongation in shoots?

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

Inheritance

Q49. In ABO blood groups, a person with genotype IAIB has both A and B antigens on red blood cells. Which type of inheritance does this illustrate?

(A) One allele masks another completely
(B) Codominance, in which both alleles are fully expressed in the heterozygote
(C) Only one allele is inherited
(D) Alleles are never expressed together

Q50. Why do linked genes not show independent assortment?

(A) They are on different chromosomes
(B) They are always dominant
(C) They are sex-linked only
(D) They are on the same chromosome

Q51. What does a chi-squared test assess?

(A) The exact genotype of every individual
(B) The mutation rate in a population
(C) Whether observed results differ significantly from expected results
(D) Whether a trait is dominant

Selection and evolution

Q52. Which statement describes stabilising selection?

(A) It favours the intermediate phenotype
(B) It favours both extremes
(C) It always creates new species
(D) It eliminates all variation

Q53. In a small population, an allele that gives no advantage becomes much more common over ten generations purely by chance. Which process best explains this change?

(A) Selection for the fittest phenotype
(B) Mutation caused by selection
(C) Migration between large populations
(D) Genetic drift, a random change in allele frequencies, especially in small populations

Q54. Which evidence supports evolution from the fossil record?

(A) Transitional forms showing gradual change over time
(B) Identical fossils in all rock layers
(C) Fossils that never change
(D) Fossils found only in one location

Classification, biodiversity and conservation

Q55. Which group includes organisms that can interbreed to produce fertile offspring?

(A) A kingdom
(B) A species
(C) A phylum
(D) A domain

Q56. Why is biodiversity important for ecosystems?

(A) It reduces the number of food chains
(B) It makes ecosystems more vulnerable
(C) It increases stability and resilience to change
(D) It prevents nutrient cycling

Q57. Which human activity most directly causes habitat loss?

(A) Deforestation for agriculture
(B) Captive breeding
(C) Seed banking
(D) Ecotourism only

Genetic technology

Q58. What is the role of primers in PCR?

(A) They cut DNA at specific sites
(B) They join DNA fragments
(C) They provide a starting point for DNA polymerase
(D) They separate DNA by size

Q59. Why are restriction enzymes used in genetic engineering?

(A) They join DNA fragments together
(B) They cut DNA at specific recognition sequences
(C) They amplify DNA
(D) They sequence DNA bases

Q60. What is gene therapy?

(A) Cloning an entire organism
(B) Creating a new species
(C) Removing all genes from a cell
(D) Introducing a functional gene to treat a genetic disorder

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-2/