A-Level Biology Practice Test 3

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 contains hydrolytic enzymes?

(A) Ribosome
(B) Lysosome
(C) Chloroplast
(D) Nucleus

Q2. What is the main function of the cytoskeleton?

(A) It synthesises lipids
(B) It stores genetic information
(C) It produces ATP
(D) It provides mechanical support and aids movement within the cell

Q3. Which cell type lacks a nucleus when mature in mammals?

(A) A red blood cell
(B) A liver cell
(C) A neurone
(D) A muscle cell

Biological molecules

Q4. Which molecule is a polysaccharide made only of glucose?

(A) Sucrose
(B) Lactose
(C) Starch
(D) Triglyceride

Q5. What is the bond between two glucose molecules in maltose?

(A) A peptide bond
(B) An ester bond
(C) A glycosidic bond
(D) A hydrogen bond only

Q6. Which test distinguishes a non-reducing sugar?

(A) Benedict’s test after acid hydrolysis
(B) Biuret test
(C) Emulsion test
(D) Iodine test

Enzymes

Q7. What is the effect of a competitive inhibitor on Vmax?

(A) Vmax decreases permanently
(B) Vmax increases
(C) Vmax becomes zero
(D) Vmax is unchanged at high substrate concentration

Q8. Which factor does NOT affect enzyme activity directly?

(A) Temperature
(B) The colour of the substrate
(C) pH
(D) Substrate concentration

Q9. What is meant by the induced fit model?

(A) The substrate changes the enzyme permanently
(B) The enzyme is consumed
(C) The active site is rigid and unchanging
(D) The active site changes shape slightly to fit the substrate

Cell membranes and transport

Q10. Which protein allows facilitated diffusion of ions?

(A) A glycoprotein only
(B) A receptor protein only
(C) A channel protein
(D) An enzyme in the cytoplasm

Q11. A phagocyte surrounds a bacterium with its cell surface membrane until the bacterium is enclosed in a vesicle inside the cell. Which term describes this uptake?

(A) Release of material in vesicles
(B) Endocytosis, uptake by membrane invagination forming a vesicle
(C) Passive diffusion of water
(D) Active pumping of ions

Q12. Which statement about the sodium-potassium pump is correct?

(A) It uses ATP to move sodium out and potassium in
(B) It moves both ions down their gradients
(C) It requires no energy
(D) It transports glucose only

The mitotic cell cycle

Q13. What is cytokinesis?

(A) Division of the cytoplasm after nuclear division
(B) Replication of DNA
(C) Separation of homologous chromosomes
(D) Formation of the spindle

Q14. Which cells in plants retain mitotic activity?

(A) Xylem vessel cells
(B) Meristem cells
(C) Guard cells only
(D) Sieve tube cells

Q15. What happens if a cell fails the G1 checkpoint?

(A) It divides immediately
(B) It undergoes meiosis
(C) It does not enter S phase
(D) It doubles its chromosome number

Nucleic acids and protein synthesis

Q16. Which enzyme synthesises RNA during transcription?

(A) DNA ligase
(B) Helicase
(C) Reverse transcriptase
(D) RNA polymerase

Q17. What is an intron?

(A) A coding sequence retained in mRNA
(B) A type of amino acid
(C) A ribosome subunit
(D) A non-coding sequence removed during splicing

Q18. Which codon is a start codon?

(A) AUG
(B) UAA
(C) UAG
(D) UGA

Transport in plants

Q19. What drives water movement in the xylem?

(A) Active pumping by xylem vessels
(B) Pressure from the phloem only
(C) A water potential gradient from soil to leaf
(D) Diffusion of sucrose

Q20. Which environmental factor increases transpiration most?

(A) High humidity
(B) Wind removing humid air from around the leaf
(C) Low temperature
(D) Darkness

Q21. What is the role of companion cells in phloem?

(A) They transport water
(B) They provide metabolic support for sieve tube elements
(C) They photosynthesise only
(D) They form the Casparian strip

Q22. Which statement about translocation is correct?

(A) It moves water only in xylem
(B) It requires no energy
(C) It moves assimilates from source to sink in phloem
(D) It occurs only at night

Transport in mammals

Q23. What is double circulation?

(A) Blood passes through the heart twice in one complete circuit
(B) Blood passes through the heart once
(C) Blood mixes in the heart
(D) Blood flows only to the lungs

Q24. Which blood vessel has valves and thin walls?

(A) An artery
(B) A capillary
(C) An arteriole
(D) A vein

Q25. What causes the first heart sound?

(A) Closure of the semilunar valves
(B) Contraction of the atria only
(C) Closure of the atrioventricular valves
(D) Opening of the semilunar valves

Q26. A blood sample is centrifuged. Which fraction contains the pigment that binds oxygen reversibly?

(A) Plasma proteins
(B) Platelets
(C) White blood cells
(D) Haemoglobin in red blood cells

Gas exchange

Q27. Which adaptation helps insects conserve water during gas exchange?

(A) Keeping spiracles permanently open
(B) Opening spiracles only when needed
(C) Lacking tracheae
(D) Breathing through gills

Q28. What is the function of cartilage rings in the trachea?

(A) They keep the airway open
(B) They absorb oxygen
(C) They produce mucus
(D) They contract the lungs

Q29. During exhalation, which muscles relax?

(A) The intercostal muscles and diaphragm
(B) The abdominal muscles only
(C) The heart muscle
(D) The muscles of the ribs contract

Q30. Why do alveoli have a moist surface?

(A) Moisture prevents blood flow
(B) Moisture blocks pathogens only
(C) Moisture increases wall thickness
(D) Gases dissolve in moisture before diffusing

Infectious diseases

Q31. A sputum sample from a patient with a persistent cough contains rod-shaped bacteria with waxy cell walls. Which pathogen is most likely present?

(A) Plasmodium falciparum
(B) Vibrio cholerae
(C) Mycobacterium tuberculosis
(D) Human immunodeficiency virus

Q32. What is the main symptom mechanism in cholera?

(A) Bacteria block the airways
(B) Toxin causes loss of water and salts from the intestine
(C) The pathogen destroys red blood cells
(D) The pathogen attacks the liver only

Q33. How can malaria be controlled?

(A) By vaccinating against bacteria
(B) By reducing mosquito breeding sites and using nets
(C) By improving water chlorination only
(D) By isolating infected people permanently

Immunity

Q34. Which cells kill infected body cells?

(A) Cytotoxic T cells
(B) B cells
(C) Plasma cells
(D) Phagocytes only

Q35. A newborn receives antibodies in breast milk that protect against certain infections for a few months. Which type of immunity is this?

(A) Immunity after vaccination
(B) Immunity after infection
(C) Immunity from memory cells
(D) Passive immunity, from antibodies received from another source

Q36. Why are antibiotics ineffective against viruses?

(A) Viruses are too large
(B) Viruses are killed by vaccines only
(C) Viruses lack the bacterial structures antibiotics target
(D) Antibiotics strengthen viruses

Energy and respiration

Q37. What is the net ATP yield from aerobic respiration of one glucose in most textbooks?

(A) 2 ATP
(B) 4 ATP
(C) About 100 ATP
(D) About 32 ATP

Q38. Which molecule is the final electron acceptor in aerobic respiration?

(A) Carbon dioxide
(B) Oxygen
(C) NAD
(D) Glucose

Q39. Where is ATP synthase located in mitochondria?

(A) In the inner mitochondrial membrane
(B) In the matrix only
(C) In the outer membrane only
(D) In the cytoplasm

Photosynthesis

Q40. What is photolysis?

(A) Splitting of glucose
(B) Fixation of carbon dioxide
(C) Splitting of water using light energy
(D) Synthesis of ATP only

Q41. Which pigment absorbs light mainly in the blue and red regions?

(A) Carotene only
(B) Xanthophyll only
(C) Chlorophyll a
(D) Anthocyanin

Q42. What happens to glycerate 3-phosphate in the Calvin cycle?

(A) All is converted to oxygen
(B) Some is used to make carbohydrate and some regenerates ribulose bisphosphate
(C) All leaves the cycle as glucose
(D) It is broken down to carbon dioxide

Homeostasis

Q43. Which structure in the kidney filters blood?

(A) The loop of Henle only
(B) The collecting duct only
(C) The ureter
(D) The glomerulus and Bowman's capsule

Q44. What does ADH do in the collecting duct?

(A) It increases water permeability by inserting aquaporins
(B) It decreases water permeability permanently
(C) It increases salt excretion only
(D) It blocks filtration

Q45. Which organ produces insulin?

(A) The pancreas
(B) The liver
(C) The kidney
(D) The adrenal gland

Control and coordination

Q46. What is a reflex arc?

(A) A learned response requiring conscious thought
(B) A hormonal response only
(C) A rapid, involuntary response pathway through the spinal cord
(D) A response in plants

Q47. Which substance is released at the neuromuscular junction?

(A) Insulin
(B) Adrenaline only
(C) Dopamine only
(D) Acetylcholine

Q48. A shoot is placed with light from one side only. It bends toward the light source over several hours. Which response is shown, and what causes the bending?

(A) Growth away from gravity
(B) Phototropism, growth towards light caused by uneven auxin distribution
(C) Growth towards water
(D) Growth in response to touch

Inheritance

Q49. A breeder has a pea plant showing the dominant phenotype for seed shape but does not know if it is homozygous or heterozygous. Which cross would reveal its genotype?

(A) A cross between two dominant individuals
(B) A cross with a homozygous recessive individual, to determine the unknown genotype
(C) A cross to produce only recessive offspring
(D) A cross between species

Q50. Which inheritance pattern shows a 3:1 phenotypic ratio in a monohybrid cross?

(A) Codominance
(B) Sex linkage only
(C) Incomplete dominance
(D) Complete dominance with heterozygous parents

Q51. In Labrador retrievers, coat colour depends on two genes, and one gene can prevent pigment production regardless of the other gene's alleles. Which phenomenon is this?

(A) Two genes on the same chromosome
(B) A gene with multiple alleles
(C) Epistasis, in which one gene masks the expression of another gene
(D) A gene on the sex chromosome

Selection and evolution

Q52. Which statement describes disruptive selection?

(A) It favours both extremes over the intermediate phenotype
(B) It favours the intermediate phenotype
(C) It removes all variation
(D) It always reduces population size

Q53. What is speciation?

(A) Extinction of a species
(B) Migration of a species
(C) Artificial selection only
(D) Formation of a new species from an existing population

Q54. Which factor increases variation within a population?

(A) Sexual reproduction and mutation
(B) Cloning only
(C) Inbreeding
(D) Stabilising selection

Classification, biodiversity and conservation

Q55. What is the correct order of taxonomic ranks from broad to narrow?

(A) Species, genus, family, order, class, phylum, kingdom, domain
(B) Domain, kingdom, phylum, class, order, family, genus, species
(C) Kingdom, domain, class, phylum, order, family, genus, species
(D) Domain, phylum, kingdom, class, family, order, genus, species

Q56. What does species richness measure?

(A) The total number of individuals
(B) The genetic variation within one species
(C) The number of different species in an area
(D) The age of a community

Q57. Which is an example of ex situ conservation?

(A) A botanical garden seed bank
(B) A national park
(C) A marine reserve
(D) A protected forest

Genetic technology

Q58. What is DNA profiling used for?

(A) Treating genetic diseases only
(B) Cloning organisms
(C) Identifying individuals from variable DNA regions
(D) Sequencing entire genomes only

Q59. In genetic engineering, what is a vector?

(A) An enzyme that cuts DNA
(B) A carrier that transfers foreign DNA into a host cell
(C) A primer for PCR
(D) A gel for electrophoresis

Q60. A cotton plant carries a bacterial gene that makes its leaves toxic to bollworm caterpillars, while the plant itself is unharmed. How should this cotton plant be classified, and why?

(A) An organism produced by selective breeding only
(B) An organism with a mutation caused by radiation only
(C) An organism cloned from a single cell
(D) A genetically modified organism, because its DNA has been altered by genetic engineering to add a new gene

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-3/