A-Level Biology Practice Test 10

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 microscope is best for viewing the three-dimensional surface of a cell?

(A) Transmission electron microscope
(B) Light microscope with a low-power objective only
(C) Confocal microscope for living cells only
(D) Scanning electron microscope

Q2. Which organelle contains hydrolytic enzymes for breaking down worn-out organelles?

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

Q3. Why must specimens for transmission electron microscopy be thin and dehydrated?

(A) Light cannot pass through thin specimens
(B) Dehydration increases magnification directly
(C) Electrons cannot pass through thick, wet material to form an image
(D) Thin specimens are always living

Biological molecules

Q4. Which test gives a brick-red precipitate for a reducing sugar?

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

Q5. Starch gives a blue-black colour with iodine. Which component is mainly responsible?

(A) Amylopectin only
(B) Cellulose
(C) Glycogen
(D) Amylose, whose helix traps iodine molecules

Q6. Which molecule is a polymer of amino acids joined by peptide bonds?

(A) A triglyceride
(B) A polypeptide
(C) A polynucleotide
(D) A disaccharide

Enzymes

Q7. Which graph shape describes reaction rate against substrate concentration for an enzyme?

(A) A straight line increasing indefinitely
(B) A curve falling steadily
(C) A curve rising steeply then levelling off at Vmax
(D) A bell-shaped curve peaking at low concentration

Q8. Why do enzymes have an optimum pH?

(A) pH alters charges on R groups, changing active site shape and binding
(B) pH changes the substrate concentration only
(C) pH destroys the substrate completely at all values
(D) pH has no effect on protein structure

Q9. A student investigates catalase activity using potato discs. Which variable should be kept constant when testing pH?

(A) pH itself
(B) The dependent variable only
(C) The volume of gas collected as the independent variable
(D) Temperature, substrate concentration and disc size

Cell membranes and transport

Q10. Which membrane component acts as a receptor for hormones or cell recognition?

(A) Phospholipid tail
(B) Glycoprotein on the outer surface
(C) Cholesterol in the interior
(D) Water channel alone

Q11. Which channel protein would be most abundant in the membranes of kidney collecting duct cells when the body needs to conserve water?

(A) A sodium-potassium pump
(B) A glucose co-transporter
(C) Aquaporins, which allow rapid facilitated diffusion of water
(D) ATP synthase

Q12. Which process describes uptake of a whole bacterium by a white blood cell?

(A) Phagocytosis, a form of endocytosis
(B) Exocytosis
(C) Facilitated diffusion
(D) Osmosis

The mitotic cell cycle

Q13. Which stage of the cell cycle involves growth and synthesis of organelles before DNA replication?

(A) S phase
(B) G2 phase
(C) M phase
(D) G1 phase

Q14. Why is mitosis important in asexual reproduction?

(A) It produces genetically varied offspring
(B) It produces genetically identical offspring, preserving successful genotypes
(C) It halves chromosome number
(D) It requires fertilisation

Q15. A root tip squash shows many cells in interphase and few in mitosis. What does this suggest?

(A) Mitosis is the longest part of the cycle
(B) Cells are not dividing at all
(C) Interphase occupies most of the cell cycle
(D) All cells are in anaphase

Nucleic acids and protein synthesis

Q16. Which base is found in RNA but not DNA, and which sugar is found in RNA?

(A) Uracil and ribose
(B) Thymine and deoxyribose
(C) Adenine and deoxyribose
(D) Cytosine and ribose only

Q17. During translation, what happens at a stop codon?

(A) A new amino acid is added
(B) The ribosome copies DNA again
(C) mRNA is spliced
(D) No tRNA binds, and the polypeptide is released

Q18. Which mutation involves insertion or deletion of a base, shifting the reading frame?

(A) Silent mutation
(B) Frameshift mutation
(C) Substitution that changes one codon only
(D) Chromosome duplication

Transport in plants

Q19. Which tissue in a stem is responsible for secondary growth in dicotyledons?

(A) Epidermis
(B) Pith
(C) Vascular cambium
(D) Root cap

Q20. Guard cells are treated with a chemical that blocks potassium ion uptake. What happens to the stoma, and why?

(A) Guard cells remain flaccid because water does not enter by osmosis, so the stoma stays closed
(B) Guard cells become turgid and bow outward, opening the stoma
(C) Guard cells actively pump water out only
(D) Guard cells divide by mitosis

Q21. Which factor would reduce water uptake by roots?

(A) Well-aerated, moist soil
(B) A large root hair surface area
(C) A steep water potential gradient
(D) Waterlogged soil with low oxygen for respiration

Transport in mammals

Q22. Which heart valve prevents backflow from the aorta into the left ventricle?

(A) Bicuspid valve
(B) Semilunar valve of the aorta
(C) Tricuspid valve
(D) Pulmonary valve on the right side

Q23. What initiates the heartbeat?

(A) The atrioventricular node alone
(B) Nerves from the brain only
(C) The sinoatrial node acting as pacemaker
(D) Blood pressure in the aorta

Q24. A pulse is felt in the wrist artery immediately after each heartbeat, yet blood flow in nearby capillaries is steady rather than pulsing. Which property of arteries explains the steady capillary flow?

(A) Their elastic walls stretch during systole and recoil during diastole, smoothing out the pulse
(B) Their walls allow exchange with surrounding tissues
(C) Their valves prevent backflow of blood
(D) They carry blood at uniformly low pressure

Gas exchange

Q25. Which condition increases the rate of diffusion across a gas exchange surface?

(A) A thicker barrier and smaller area
(B) A lower temperature only
(C) A longer diffusion distance
(D) A larger surface area and a steeper concentration gradient

Q26. What is the role of surfactant in alveoli?

(A) To increase surface tension and collapse alveoli
(B) To reduce surface tension and prevent alveolar collapse
(C) To trap all inhaled particles
(D) To carry oxygen in blood

Q27. Why is ventilation important even when diffusion is efficient?

(A) It replaces diffusion entirely
(B) It thickens the exchange surface
(C) It maintains concentration gradients by renewing air at the surface
(D) It stops blood flow

Q28. In which organism would gas exchange occur mainly by diffusion across a moist body surface?

(A) A small flatworm with a large surface area to volume ratio
(B) A large mammal
(C) An active insect
(D) A fish with gills

Infectious diseases

Q29. Which statement about HIV transmission is correct?

(A) It spreads by casual contact and sharing food
(B) It spreads through drinking water
(C) It spreads by mosquito bites
(D) It spreads through blood and sexual fluids, not by casual contact

Q30. Which stage of the Plasmodium life cycle is taken up by a mosquito?

(A) Sporozoites from liver cells
(B) Gametocytes from human blood
(C) Merozoites from red cells only
(D) Oocysts from human skin

Q31. Why is tuberculosis difficult to treat?

(A) It is caused by a virus
(B) Antibiotics work in one day only
(C) The bacterium has a waxy cell wall and treatment takes many months
(D) The bacterium cannot be cultured

Q32. Which public health measure best controls a waterborne disease outbreak?

(A) Treating water supplies and improving sanitation
(B) Closing schools only
(C) Mass vaccination against all viruses
(D) Using bed nets alone

Immunity

Q33. Why can the same pathogen trigger a much faster immune response on second exposure than on first exposure?

(A) Because antibodies remain at peak level in the blood forever
(B) Because white blood cells change their type permanently
(C) Because a vaccine kills all pathogens on first contact
(D) Because memory lymphocytes formed during the first response divide rapidly to produce effector cells and antibodies

Q34. Which process increases antibody diversity before infection?

(A) Mutation caused by the pathogen
(B) Random rearrangement of antibody gene segments during lymphocyte development
(C) Vaccination alone
(D) Cloning of one B cell only

Q35. In an allergic response, which substance causes inflammation and itching?

(A) Insulin
(B) Adrenaline
(C) Histamine released by mast cells
(D) Haemoglobin

Q36. Why does passive immunity not give long-term protection?

(A) No memory cells are produced
(B) Antibodies are too large to circulate
(C) The immune system is suppressed permanently
(D) Antigens are not recognised

Energy and respiration

Q37. Which molecule is oxidised in the Krebs cycle to release carbon dioxide?

(A) Glucose directly
(B) Pyruvate in the cytoplasm only
(C) Oxygen
(D) Acetyl CoA, via citrate and other intermediates

Q38. What is the net ATP yield from glycolysis alone?

(A) Zero
(B) Two ATP
(C) Four ATP
(D) Thirty-two ATP

Q39. Why does anaerobic respiration yield less ATP than aerobic respiration?

(A) Glucose is not broken down at all
(B) No ATP is made in glycolysis
(C) Glucose is only partly broken down, and most energy remains in lactate or ethanol
(D) Oxygen is used up too quickly

Photosynthesis

Q40. Which organelle and membrane carry out the light-dependent reactions?

(A) Chloroplast, thylakoid membrane
(B) Mitochondrion, inner membrane
(C) Chloroplast, outer membrane only
(D) Nucleus, nuclear membrane

Q41. How is reduced NADP regenerated for reuse in the light-dependent reactions?

(A) It is broken down by photolysis
(B) It is stored as starch
(C) It is excreted from the chloroplast
(D) It is oxidised in the Calvin cycle when it donates hydrogen

Q42. A leaf disc experiment shows faster floating at higher light intensity. What does floating indicate?

(A) Carbon dioxide uptake making discs heavier
(B) Oxygen production filling intercellular spaces, making discs buoyant
(C) Water loss from discs
(D) Starch accumulation only

Homeostasis

Q43. Which hormone lowers blood glucose by promoting glycogenesis?

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

Q44. In the kidney, where does most water reabsorption occur by osmosis following solute uptake?

(A) Proximal convoluted tubule and loop of Henle
(B) Glomerulus
(C) Ureter
(D) Renal pelvis

Q45. Which response occurs when core temperature falls?

(A) Sweating and vasodilation
(B) Increased skin blood flow only
(C) Reduced metabolic rate to zero
(D) Vasoconstriction, shivering and piloerection

Control and coordination

Q46. Which part of the brain coordinates balance and fine motor control?

(A) Cerebrum
(B) Cerebellum
(C) Medulla only
(D) Hypothalamus

Q47. What is spatial summation?

(A) Repeated firing from one neurone
(B) Inhibition from a single neurone
(C) Simultaneous firing from several presynaptic neurones summing at one postsynaptic neurone
(D) Saltatory conduction

Q48. Which hormone regulates metabolic rate?

(A) Thyroxine
(B) Insulin
(C) ADH
(D) Auxin

Inheritance

Q49. Two parents are both heterozygous for cystic fibrosis, a recessive condition. What is the probability of an affected child?

(A) One half
(B) Three quarters
(C) One in sixteen
(D) One quarter

Q50. Which term describes different forms of the same gene?

(A) Locus
(B) Allele
(C) Genotype
(D) Phenotype

Q51. In a pedigree, a trait appears in every generation and affects both sexes equally. What is most likely?

(A) Recessive X-linked inheritance
(B) Recessive autosomal inheritance only
(C) Dominant autosomal inheritance
(D) Mitochondrial inheritance only

Selection and evolution

Q52. Which statement about genetic drift is correct?

(A) It is random change in allele frequencies, strongest in small populations
(B) It is selection for advantageous alleles
(C) It only occurs in large populations
(D) It increases adaptation directly

Q53. Which is an example of convergent evolution?

(A) Homologous limbs in mammals from a common ancestor
(B) Identical DNA in clones
(C) Speciation by geographical isolation alone
(D) Wings in bats and birds evolving separately for flight

Q54. What is required for natural selection to act?

(A) Identical individuals only
(B) Variation, inheritance and differential survival and reproduction
(C) No environmental change
(D) Artificial breeding only

Classification, biodiversity and conservation

Q55. Which classification system uses three domains?

(A) The five-kingdom system only
(B) Linnaean binomial system only
(C) The three-domain system of Woese
(D) A system based only on cell wall type

Q56. A survey records 40 plant species, high genetic variation within each species, and five distinct habitat types in a woodland. Which term best summarises all three levels recorded?

(A) Biodiversity, the variety of genes, species and ecosystems in an area
(B) The number of individuals of one species only
(C) The biomass of producers only
(D) The number of endangered species only

Q57. Which strategy best protects biodiversity in the long term?

(A) Keeping single species in zoos only
(B) Introducing non-native species widely
(C) Clearing forest for monoculture
(D) Protecting habitats and reducing threats such as pollution and overexploitation

Genetic technology

Q58. How are DNA fragments separated in gel electrophoresis?

(A) By charge only, with no effect of size
(B) By size, as smaller fragments move further through the gel toward the positive electrode
(C) By colour
(D) By temperature only

Q59. Which organism is commonly used to produce human insulin by genetic engineering?

(A) A virus only
(B) A fungus that causes disease
(C) Genetically modified bacteria
(D) A plant virus

Q60. A tomato plant has been given a gene from a bacterium that produces a protein toxic to insect pests. What is the most accurate description of this plant?

(A) A genetically modified organism, because its genome has been altered by adding a gene

(B) An organism produced only by selective breeding

(C) An organism with no DNA of its own

(D) A clone with DNA identical to the parent plant

Answer Key

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

Worked explanations for all 60 questions: quaidianpoint.com/alevel-biology-practice-test-10/