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SCO INTERNATIONAL BIOLOGY OLYMPIAD

Official Question Sample Paper

Grade 9 / Class 9

The Fundamental Unit of Life | Tissues | Diversity | Health & Disease | Natural Resources | Food Resources

Conceptual Biology	Applied Reasoning	Global Readiness
Answer Key	Explanations	Academic Layout

Paper Structure

Section	Question Nos.	Skill Focus	Marks
General Biology	1-30	Concept clarity, diagrams, basic application	30
Reason/Assertion	31-40	Scientific explanation and reasoning	10
Case Study	41-45	Data, passage, and applied biology	5
Achievers Section	46-50	Higher-order challenge questions	10

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General Section

Questions 1 to 30 test conceptual clarity, observation, classification, health awareness, and resource management.

Q1 **Which statement best describes the cell theory idea relevant to Class 9 biology?**

A. Cells are present only in animals

B. All living organisms are made of cells and cells arise from pre-existing cells

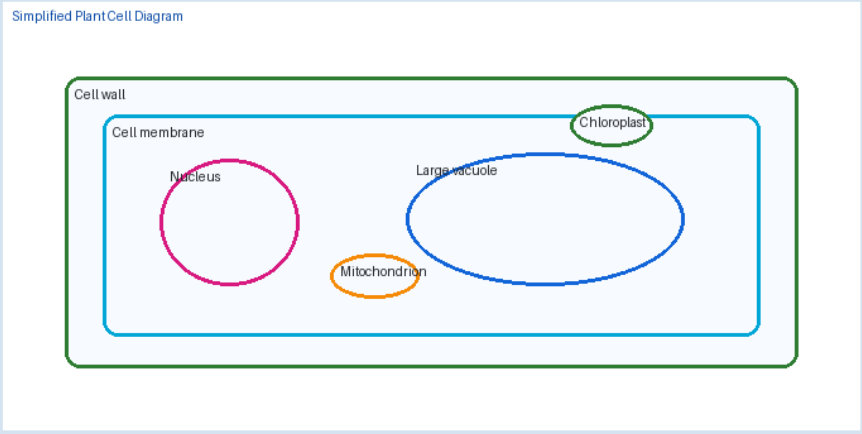
C. Only plant cells have life processes

D. Cells do not contain chemical substances

Answer: B

Explanation: Cell theory states that living organisms are made of cells and new cells arise from existing cells.

Q2 **A drop of iodine solution stains a cell part dark, revealing a large rounded structure. Which part is most likely highlighted?**



A. Nucleus

B. Cell wall

C. Vacuole

D. Chloroplast

Answer: A

Explanation: The nucleus often stains dark because it contains chromatin and controls cellular activities.

Q3 **Which movement is an example of diffusion?**

A. Movement of water through a semipermeable membrane only

B. Movement of perfume smell from one corner of a room to another

C. Division of a bacterial cell

D. Formation of proteins at ribosomes

Answer: B

Explanation: Diffusion is the movement of particles from higher concentration to lower concentration, such as perfume spreading in air.

Q4 **Which organelle digests worn-out cell parts and is sometimes called the suicide bag of the cell?**

A. Lysosome

B. Ribosome

C. Nucleus
D. Cell wall

Answer: A

Explanation: Lysosomes contain digestive enzymes that break down waste, worn-out organelles, and foreign materials.

Q5 Which cell component gives plant cells strength and a definite shape?

A. Cell wall
B. Nuclear membrane
C. Mitochondrion
D. Ribosome

Answer: A

Explanation: The cell wall is a rigid outer covering in plant cells that provides support and protection.

Q6 What is the main function of chloroplasts?

A. Protein digestion
B. Photosynthesis
C. Osmosis control
D. Storage of genetic information

Answer: B

Explanation: Chloroplasts contain chlorophyll and are the site of photosynthesis in green plants.

Q7 A cell with a large central vacuole and chloroplasts is most likely:

A. A plant cell
B. An animal cell
C. A virus
D. A red blood cell

Answer: A

Explanation: Large vacuoles and chloroplasts are typical of plant cells.

Q8 Why are cells called the structural and functional units of life?

A. They are always visible to the naked eye
B. They form the body structure and perform life processes
C. They are found only in leaves
D. They do not need energy

Answer: B

Explanation: Cells build the body of organisms and carry out essential functions like nutrition, respiration, and reproduction.

Q9 Which tissue in plants is responsible for transporting food from leaves to other parts?

A. Xylem
B. Phloem
C. Epidermis
D. Meristem

Answer: B

Explanation: Phloem transports food prepared in leaves to storage and growth regions.

Q10 **Which tissue provides flexibility and support in parts like the ear pinna?**

A. Cartilage
B. Blood
C. Skeletal muscle
D. Nervous tissue

Answer: A

Explanation: Cartilage is a flexible connective tissue that provides support in structures such as ear pinna and nose tip.

Q11 **Which tissue has cells that can contract and relax to bring about movement?**

A. Muscle tissue
B. Epithelial tissue
C. Xylem
D. Blood

Answer: A

Explanation: Muscle tissue is specialized for contraction and movement.

Q12 **What is the main feature of epithelial tissue?**

A. Cells are widely separated in a matrix
B. Cells are compactly arranged and cover surfaces
C. It conducts impulses only
D. It transports water in plants

Answer: B

Explanation: Epithelial tissue forms coverings and linings with closely packed cells.

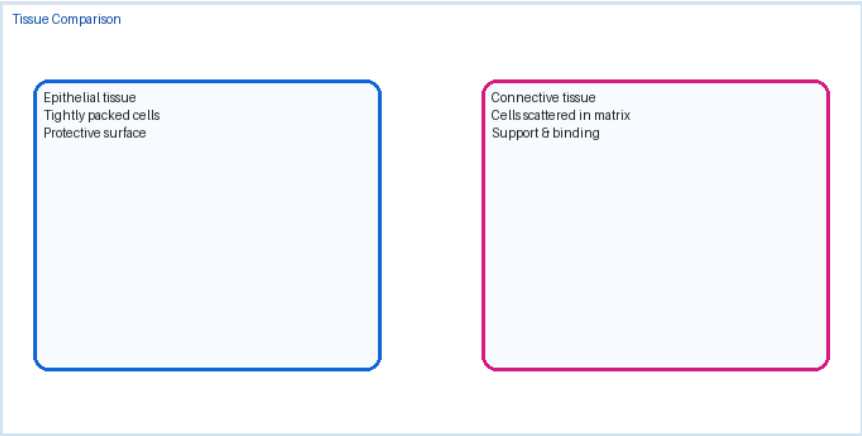
Q13 **Which is a simple permanent plant tissue?**

A. Parenchyma
B. Xylem
C. Phloem
D. Blood

Answer: A

Explanation: Parenchyma is a simple permanent plant tissue involved in storage, photosynthesis in chlorenchyma, and support through turgidity.

Q14 **Which pair is correctly matched?**



A. Neuron - impulse conduction
B. Xylem - food transport
C. Adipose tissue - oxygen transport
D. Epithelial tissue - contraction

Answer: A
Explanation: Neurons transmit nerve impulses. Xylem transports water, adipose stores fat, and muscle tissue contracts.

Q15 Which feature is used to classify animals into vertebrates and invertebrates?

A. Presence or absence of a backbone
B. Leaf shape
C. Type of soil
D. Presence of flowers only

Answer: A
Explanation: The backbone or vertebral column is used to distinguish vertebrates from invertebrates.

Q16 Which taxonomic category is the most specific?

A. Kingdom
B. Class
C. Family
D. Species

Answer: D
Explanation: Species is the most specific rank in the given options.

Q17 Which kingdom includes organisms such as mushrooms and molds?

A. Fungi
B. Plantae
C. Monera
D. Animalia

Answer: A
Explanation: Fungi include mushrooms, molds, and yeasts. They are generally heterotrophic and have chitin in their cell walls.

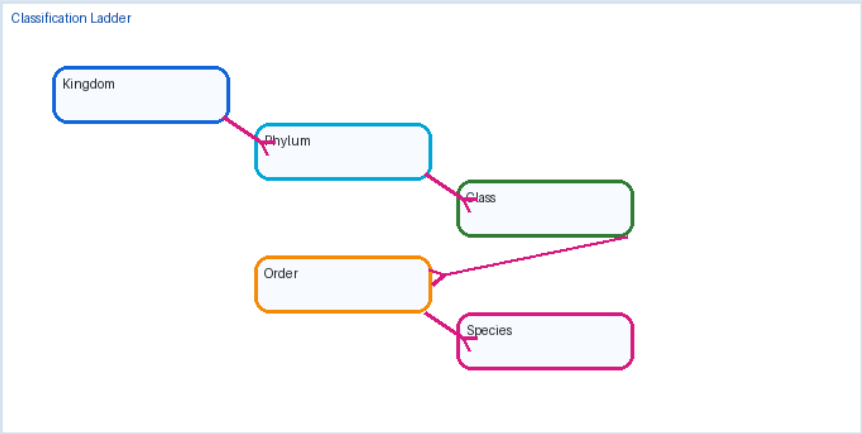
Q18 **Which group includes organisms that are autotrophic and have cell walls made mainly of cellulose?**

A. Plantae
B. Animalia
C. Fungi
D. Protozoa

Answer: A

Explanation: Plants are generally autotrophic, have chlorophyll, and possess cellulose cell walls.

Q19 **Why do scientists use classification?**



A. To make organism names longer
B. To organize biodiversity and understand relationships among organisms
C. To remove local names completely
D. To show that all organisms are identical

Answer: B

Explanation: Classification helps organize living diversity and study similarities, differences, and evolutionary relationships.

Q20 **Which disease is commonly spread by mosquitoes?**

A. Malaria
B. Diabetes
C. Scurvy
D. Rickets

Answer: A

Explanation: Malaria is a vector-borne disease spread by female Anopheles mosquitoes.

Q21 **Which is the best example of personal hygiene preventing disease?**

A. Washing hands before eating
B. Sharing drinking cups during illness
C. Keeping waste in open drains
D. Using unsafe water

Answer: A

Explanation: Handwashing reduces the transfer of disease-causing microbes.

Q22 **Which statement about health is most complete?**

A. Health means only absence of fever
B. Health includes physical, mental, and social well-being
C. Health means never needing food
D. Health depends only on medicine

Answer: B
Explanation: Health is a state of overall well-being, not just the absence of disease.

Q23 **A person has a disease caused by long-term poor diet. This is best classified as:**

A. A deficiency or non-infectious disease
B. A vector-borne disease only
C. A water-borne infection
D. A viral disease only

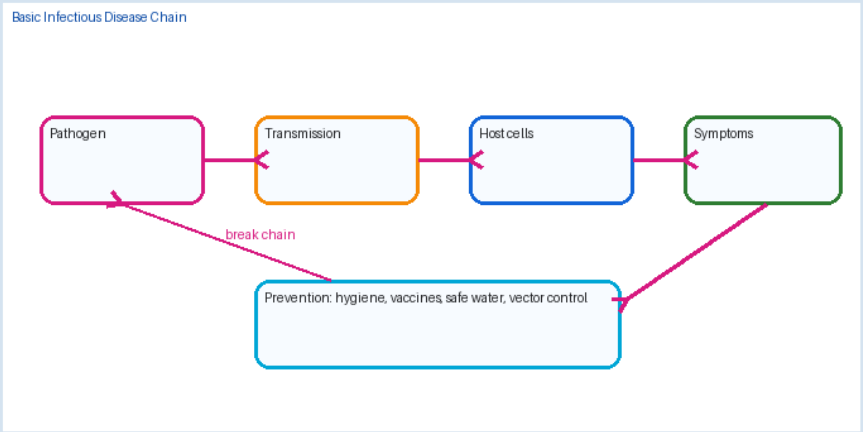
Answer: A
Explanation: Diseases caused by nutritional imbalance are usually non-infectious deficiency diseases.

Q24 **Which pathogen causes tuberculosis?**

A. Bacterium
B. Fungus
C. Alga
D. Earthworm

Answer: A
Explanation: Tuberculosis is caused by a bacterium, Mycobacterium tuberculosis.

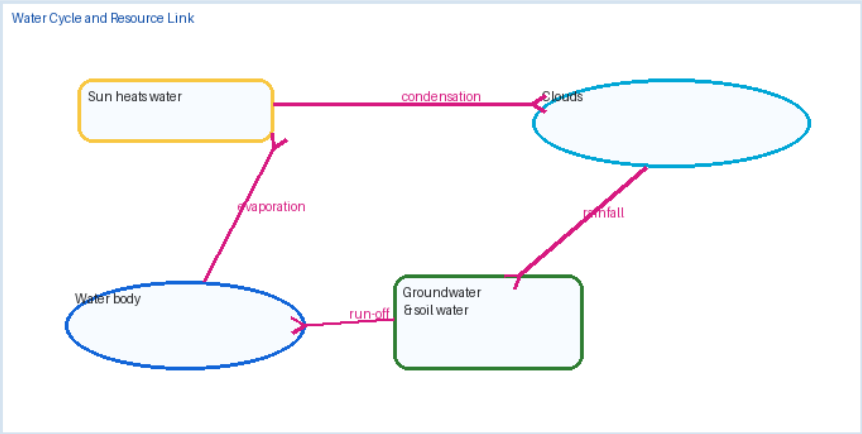
Q25 **What is the most effective community action to reduce water-borne diseases?**



A. Safe water supply and sanitation
B. More stagnant drains
C. Avoiding vaccination in all cases
D. Using antibiotics without diagnosis

Answer: A
Explanation: Safe water, sanitation, and hygiene are key to preventing water-borne diseases.

Q26 **Which cycle is most directly linked with evaporation, condensation, and precipitation?**



A. Water cycle
B. Carbon cycle only
C. Nitrogen fixation
D. Food chain

Answer: A

Explanation: The water cycle involves evaporation, condensation, precipitation, run-off, infiltration, and transpiration.

Q27 **Which gas is used by green plants during photosynthesis?**

A. Carbon dioxide
B. Nitrogen
C. Hydrogen
D. Argon

Answer: A

Explanation: Plants take in carbon dioxide for photosynthesis and release oxygen as a by-product.

Q28 **Which practice helps conserve water in agriculture?**

A. Drip irrigation
B. Open flood irrigation without planning
C. Leaking canals
D. Overwatering every day

Answer: A

Explanation: Drip irrigation delivers water near plant roots and reduces wastage.

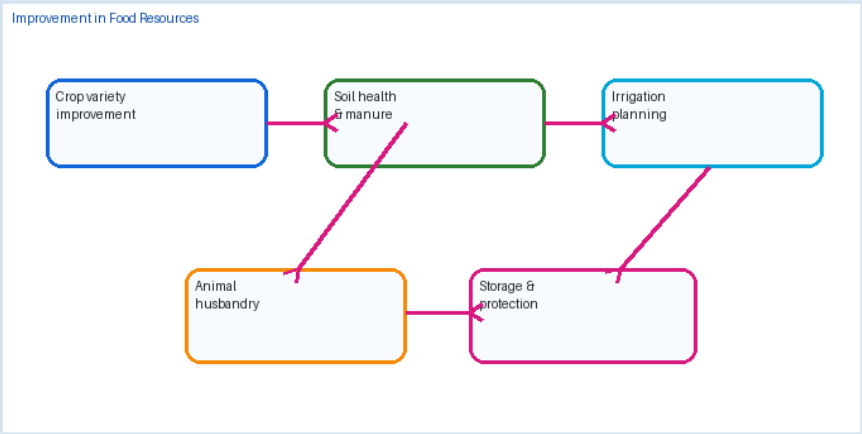
Q29 **Which natural resource is non-renewable on the human time scale?**

A. Coal
B. Sunlight
C. Wind
D. Rainwater

Answer: A

Explanation: Coal forms over millions of years and is used much faster than it is formed.

Q30 **Which method improves soil fertility by adding decomposed organic matter?**



A. Composting
B. Excessive pesticide use
C. Soil erosion
D. Burning all biomass

Answer: **A**

Explanation: Composting adds humus and nutrients to soil, improving structure and fertility.

Reason and Assertion

For Questions 31 to 40, choose the correct option based on the relationship between the Assertion and Reason.

Q31 **Assertion: Osmosis involves movement of water through a semipermeable membrane. Reason: Water moves from higher water concentration to lower water concentration.**

A. Both Assertion and Reason are true, and Reason correctly explains Assertion.
B. Both true, Reason not explanation.
C. Assertion true, Reason false.
D. Assertion false, Reason true.

Answer: **A**

Explanation: The reason correctly describes osmosis.

Q32 **Assertion: Ribosomes help in protein synthesis. Reason: Ribosomes are the sites where amino acids are joined to form proteins.**

A. Both Assertion and Reason are true, and Reason correctly explains Assertion.
B. Both true, Reason not explanation.
C. Assertion true, Reason false.
D. Assertion false, Reason true.

Answer: **A**

Explanation: Ribosomes directly participate in protein synthesis.

Q33 **Assertion: Phloem transports water and minerals. Reason: Phloem contains sieve tubes and companion cells.**

A. Both Assertion and Reason are true, and Reason correctly explains Assertion.
B. Both true, Reason not explanation.
C. Assertion true, Reason false.
D. Assertion false, Reason true.

Answer: D

Explanation: Phloem transports food, not water and minerals. The reason is true.

Q34 **Assertion: Vaccination helps prevent some infectious diseases. Reason: It prepares the immune system to recognize a pathogen.**

A. Both Assertion and Reason are true, and Reason correctly explains Assertion.
B. Both true, Reason not explanation.
C. Assertion true, Reason false.
D. Assertion false, Reason true.

Answer: A

Explanation: Vaccination helps the body develop immune memory.

Q35 **Assertion: Mosquito control can reduce malaria. Reason: Mosquitoes act as vectors for malaria parasite transmission.**

A. Both Assertion and Reason are true, and Reason correctly explains Assertion.
B. Both true, Reason not explanation.
C. Assertion true, Reason false.
D. Assertion false, Reason true.

Answer: A

Explanation: Breaking vector transmission reduces spread of malaria.

Q36 **Assertion: Biodiversity should be conserved. Reason: Biodiversity supports ecosystem stability and useful biological resources.**

A. Both Assertion and Reason are true, and Reason correctly explains Assertion.
B. Both true, Reason not explanation.
C. Assertion true, Reason false.
D. Assertion false, Reason true.

Answer: A

Explanation: Biodiversity conservation protects ecological balance and resources.

Q37 **Assertion: Forest removal can affect rainfall. Reason: Trees contribute to transpiration and atmospheric moisture.**

A. Both Assertion and Reason are true, and Reason correctly explains Assertion.
B. Both true, Reason not explanation.
C. Assertion true, Reason false.
D. Assertion false, Reason true.

Answer: A

Explanation: Reduced transpiration may alter local moisture and rainfall patterns.

Q38 **Assertion: Crop rotation improves sustainable agriculture. Reason: It can reduce pest build-up and improve soil nutrient balance.**

A. Both Assertion and Reason are true, and Reason correctly explains Assertion.
B. Both true, Reason not explanation.
C. Assertion true, Reason false.
D. Assertion false, Reason true.

Answer: **A**
Explanation: Crop rotation helps maintain soil fertility and disrupt pest life cycles.

Q39 **Assertion: Viruses can multiply independently outside living cells. Reason: Viruses have cellular machinery like ribosomes and mitochondria.**

A. Both Assertion and Reason are true, and Reason correctly explains Assertion.
B. Both true, Reason not explanation.
C. Assertion true, Reason false.
D. Both Assertion and Reason are false.

Answer: **D**
Explanation: Viruses cannot multiply independently and lack ribosomes and mitochondria.

Q40 **Assertion: Manure improves soil structure. Reason: It adds organic matter to the soil.**

A. Both Assertion and Reason are true, and Reason correctly explains Assertion.
B. Both true, Reason not explanation.
C. Assertion true, Reason false.
D. Assertion false, Reason true.

Answer: **A**
Explanation: Organic matter improves aeration, water retention, and soil structure.

Case Study Section

Questions 41 to 45 use short passages, diagrams, or real-life biological situations. The passage is part of the question block.

Q41 **Case Study: A teacher shows onion peel cells and cheek cells. Onion cells have a cell wall, while cheek cells do not. Which conclusion is correct?**

A. Both are animal cells
B. Onion peel cells are plant cells and cheek cells are animal cells
C. Cheek cells have chloroplasts
D. Onion cells lack a nucleus

Answer: **B**
Explanation: Cell wall is a typical plant cell feature; cheek cells are animal cells and lack a cell wall.

Q42 **Case Study: A pond receives sewage, and soon there is bad smell, algal growth, and fewer fish. What is the likely cause?**

A. Reduced nutrients always improve fish life
B. Organic pollution and oxygen depletion

C. Photosynthesis stopped forever

D. All fish became insects

Answer: B

Explanation: Sewage adds organic matter and nutrients, causing algal growth and oxygen depletion.

Q43 Case Study: A farmer chooses a crop variety that matures early and resists disease. Which goal of crop improvement is being shown?

A. Higher resilience and better production

B. Lower food security

C. Reduced seed quality

D. Less adaptation

Answer: A

Explanation: Improved varieties may provide disease resistance, early maturity, better yield, and stress tolerance.

Q44 Case Study: A family stores grains in a damp room. After some weeks, insects and fungi appear. Which storage practice is best?

A. Dry grains properly and store in clean, pest-proof containers

B. Add water before storage

C. Keep grains open on the floor

D. Ignore pests until harvest

Answer: A

Explanation: Dry, clean, pest-proof storage reduces fungal growth and insect damage.

Q45 Case Study: During a health camp, students learn that cough droplets spread some respiratory infections. Which preventive behavior is most useful?

A. Cover coughs, wash hands, and avoid close contact when ill

B. Share towels and bottles

C. Spit near classrooms

D. Avoid all clean water

Answer: A

Explanation: Respiratory hygiene and handwashing reduce droplet transmission.

Achievers Section

Questions 46 to 50 are higher-order questions and carry 2 marks each.

Q46 Achievers: Why does a multicellular organism need specialized tissues?

A. Each cell performs every function equally

B. Different tissues divide labour and improve efficiency

C. Tissues prevent all diseases forever

D. Specialization removes the need for organs

Answer: B

Explanation: Division of labour allows tissues and organs to perform specialized functions efficiently.

Q47 **Achievers: A plant with damaged phloem may show reduced sugar transport. Which observation supports this?**

A. Roots receive less food from leaves
B. Leaves receive less water from roots
C. Stem becomes a neuron
D. Chloroplasts disappear immediately

Answer: A
Explanation: Phloem transports sugars from leaves to growing and storage regions such as roots.

Q48 **Achievers: In a biodiversity survey, two animals look similar but belong to different groups. Which evidence would most strengthen classification?**

A. Molecular/DNA evidence along with morphology
B. Only body color
C. Only habitat name
D. Only local common names

Answer: A
Explanation: Modern classification uses multiple lines of evidence, including morphology and molecular data.

Q49 **Achievers: Which public health strategy best combines prevention and treatment?**

A. Safe water, vaccination, diagnosis, and rational medicine use
B. Antibiotics for all diseases
C. No sanitation but more posters
D. Avoiding all doctors

Answer: A
Explanation: A balanced strategy includes prevention through hygiene and vaccines plus correct diagnosis and treatment.

Q50 **Achievers: Which food-resource plan is best for climate variability?**

A. Single crop, high water use, no soil care
B. Diverse crops, water-saving irrigation, soil organic matter, and resistant varieties
C. Only chemical pesticide use
D. Remove livestock health checks

Answer: B
Explanation: Diversity, water conservation, soil health, and improved varieties help reduce risk under changing climate.

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Answer Key

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