CLASS 11 BIOLOGY EXTRA QUESTIONS

Class 11 Biology Chapter 8 Cell – The Unit of Life – Extra Questions with Answers

Extra practice questions for Class 11 Biology Chapter 8 (Cell: The Unit of Life), beyond the textbook. These Class 11 Biology Chapter 8 important questions are handy for last-minute exam practice.

Contents

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Very Short Answer Questions (1 mark)

Q1. Who proposed the fluid mosaic model of the plasma membrane?
Ans: Singer and Nicolson.

Q2. What is the site of photosynthesis in plant cells?
Ans: Chloroplast.

Q3. Which organelle is known as the "suicide bag" of the cell?
Ans: Lysosome.

Q4. What are the two types of endoplasmic reticulum?
Ans: Rough ER (with ribosomes) and Smooth ER (without ribosomes).

Q5. What is the genetic material of a prokaryotic cell called?
Ans: Nucleoid.

Short Answer Questions (2–3 marks)

Q6. Differentiate between prokaryotic and eukaryotic ribosomes.
Ans: Prokaryotic ribosomes are 70S; eukaryotic (cytoplasmic) ribosomes are 80S. Eukaryotic mitochondria/chloroplasts contain 70S ribosomes, similar to prokaryotes.

Q7. List the functions of the Golgi apparatus.
Ans: Modification, packaging, and dispatch of materials (like proteins from the ER) into vesicles, often for secretion; also site of glycosylation.

Q8. What is the composition and function of the plant cell wall?
Ans: Made of cellulose; provides mechanical support, shape, and protection to the cell, and prevents excessive water uptake (osmotic lysis).

Higher-Order Thinking / Application Questions

Q9. Explain how the endosymbiotic theory accounts for the unique characteristics of mitochondria and chloroplasts (such as their own DNA, 70S ribosomes, and double membrane), using this evidence to argue that these organelles originated from free-living prokaryotic ancestors.
Ans: The endosymbiotic theory proposes that mitochondria and chloroplasts originated as free-living prokaryotic organisms (likely aerobic bacteria for mitochondria and photosynthetic cyanobacteria for chloroplasts) that were engulfed by a larger host cell in the distant evolutionary past, and instead of being digested, developed a mutually beneficial (symbiotic) relationship with the host, eventually becoming permanent, integrated organelles. Several pieces of structural evidence support this theory: both organelles possess their own circular DNA, similar to bacterial DNA (unlike linear nuclear DNA), suggesting an independent evolutionary origin. Both contain 70S ribosomes matching bacterial-type ribosomes, rather than the 80S ribosomes of the surrounding eukaryotic cytoplasm. Additionally, both organelles are bound by a double membrane, consistent with engulfment (phagocytosis) by a host cell: the inner membrane representing the original bacterial membrane, and the outer membrane representing the host's engulfing membrane. Together, this evidence strongly supports that mitochondria and chloroplasts were once

independent, free-living prokaryotes that became permanently incorporated into eukaryotic cells through an ancient endosymbiotic event.

Q10. Explain why plant cells require a large central vacuole and rigid cell wall to maintain their shape and prevent bursting in a hypotonic environment, while animal cells (lacking both structures) would lyse (burst) under similar conditions, connecting this to the concept of osmotic pressure and turgor.
Ans: When a plant cell is placed in a hypotonic solution, water moves into the cell by osmosis, filling the large central vacuole and increasing internal (turgor) pressure. Because the cell is surrounded by a rigid cellulose cell wall, the wall exerts an equal, opposite counter-pressure (wall pressure), preventing the cell from expanding indefinitely and rupturing — instead, the cell becomes turgid (firm), which supports non-woody plant parts. An animal cell in the same hypotonic environment also takes in water by osmosis, but lacking both a large vacuole (to buffer excess water) and a rigid wall (to resist internal pressure), continued water influx causes the plasma membrane — which is comparatively fragile and elastic — to rupture (lysis), destroying the cell. This is why plant cells evolved a large vacuole and rigid wall as protective adaptations to tolerate the significant osmotic water movements that are normal in plant physiology, whereas animal cells, existing in tightly regulated isotonic environments (like blood plasma), do not require these adaptations.

Class 11 Biology Chapter 8 – Solutions and Notes

For complete step-by-step answers and a quick summary, check the Class 11 Biology Chapter 8 Solutions and Class 11 Biology Chapter 8 Revision Notes.

See also: Chapter 1 | Chapter 2 | Chapter 3 | Chapter 4 | Chapter 5 | Chapter 6 | Chapter 7 | Chapter 8

Practice more: Chapter 1 | Chapter 2 | Chapter 3 | Chapter 4 | Chapter 5 | Chapter 6 | Chapter 7

Quick revision: Chapter 1 | Chapter 2 | Chapter 3 | Chapter 4 | Chapter 5 | Chapter 6 | Chapter 7