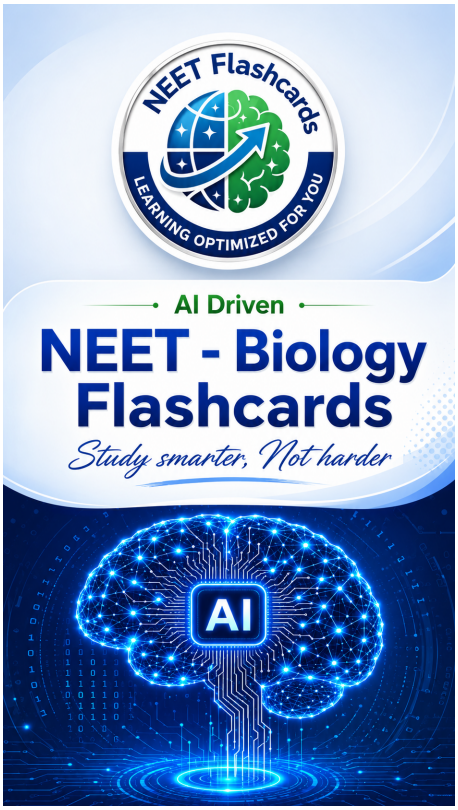

Question	Answer
Are all microbes harmful?	No, several microbes are useful to humans in diverse ways.
At which pH are lysosomal enzymes optimally active?	Acidic pH.
Does the protein-to-lipid ratio remain the same in all cell membranes?	No, it varies considerably among cell types.
For how long have microbes been used in sewage treatment?	For more than a hundred years.
How are phospholipids arranged in the plasma membrane?	In a bilayer.
How can microbes reduce the use of chemical fertilisers?	By acting as biofertilisers.
How does Bacillus thuringiensis kill insect larvae?	Toxin is released in the larval gut, killing the larvae.
How is the organisation of prokaryotic cells fundamentally similar?	All prokaryotes have a similar basic cellular organisation despite variation in shape and function.
How much volume of a plant cell can vacuoles occupy?	Up to 90% of the cell volume.
In what forms do mesosomal extensions occur?	Vesicles, tubules and lamellae.
Name some food materials fermented by microbes.	Fish, soybean, and bamboo shoots.
Name the four basic shapes of bacteria.	Bacillus, coccus, vibrio and spirillum.
Name the section that discusses industrial production of chemicals and enzymes by microbes.	Chemicals, Enzymes and other Bioactive Molecules.
Name the three types of plastids.	Chloroplasts, chromoplasts and leucoplasts.
Name two double membrane-bound organelles.	Mitochondria and chloroplasts.
Name two free-living nitrogen-fixing bacteria.	Azospirillum and Azotobacter.
What are basal bodies?	Centriole-like structures from which cilia and flagella emerge.
What are biofertilisers?	Organisms that enrich the nutrient quality of soil.
What are centrioles made up of?	Nine evenly spaced peripheral fibrils of tubulin protein.
What are cyanobacteria?	Autotrophic microbes found in aquatic and terrestrial environments.
What are eukaryotic cells?	Cells with membrane-bound nuclei.
What are fermentors?	Large vessels used for industrial-scale production of microbial products.
What are integral proteins?	Proteins partially or totally buried in the membrane.

Question	Answer
What are leucoplasts?	Colourless plastids storing nutrients.
What are multicellular organisms?	Organisms composed of many cells.
What are nuclear pores?	Minute pores formed by fusion of the two nuclear membranes.
What are pili?	Elongated tubular structures made of special protein.
What are plasmids?	Small circular DNA present outside the genomic DNA in many bacteria.
What are the major components of sewage?	Human excreta, organic matter, and microbes.
What are the subunits of 70S ribosomes?	50S and 30S.
What beneficial role do LAB play in the human stomach?	They help check disease-causing microbes.
What covers cilia and flagella?	Plasma membrane.
What does a high BOD indicate?	Greater organic matter and higher polluting potential.
What happens during secondary or biological treatment?	Primary effluent is aerated to promote growth of aerobic microbes.
What happens to proteins synthesised on ER in the Golgi apparatus?	They are modified in the Golgi cisternae before release.
What is - Thylakoids	Flat membranous sacs in stroma.
What is a centromere?	The primary constriction of a chromosome holding chromatids together.
What is a mesosome in a prokaryotic cell?	A specialised differentiated form of plasma membrane formed by infoldings.
What is biogas?	A gaseous mixture produced during sludge digestion that can be used as fuel.
What is Biology?	Biology is the study of living organisms.
What is mycorrhiza?	A symbiotic association between fungi and plant roots.
What is one of the most important functions of the plasma membrane?	Transport of molecules across it.
What is osmosis?	Movement of water by diffusion across a membrane.
What is sewage?	Municipal waste-water containing organic matter and microbes.
What is smooth endoplasmic reticulum (SER)?	ER lacking ribosomes on its surface.
What is the advantage of biocontrol measures?	They reduce the heavy use of toxic pesticides.
What is the dense homogeneous substance inside the inner compartment called?	Matrix.

Question	Answer
What is the depth of a typical biogas plant tank?	About 10–15 feet deep.
What is the effect of baculoviruses on plants, mammals, birds, fish, and non-target insects?	They have no negative impacts.
What is the function of the bacterial cell wall?	It determines cell shape and provides structural support.
What is the lumen in chloroplasts?	The space enclosed by thylakoid membranes.
What is the main purpose of primary sewage treatment?	Physical removal of particles through filtration and sedimentation.
What is the nucleolus?	A spherical structure present in the nucleoplasm.
What is the outer boundary of a typical plant cell like the onion cell?	Cell wall.
What is the semi-fluid matrix of the cell called?	Cytoplasm.
What is the singular form of cilia?	Cilium.
What is the space between the two nuclear membranes called?	Perinuclear space.
What knowledge is important for successful biocontrol?	Understanding life cycles, feeding patterns, and habitats of pests and predators.
What surrounds the central tubules?	Central sheath.
What type of nucleus is present in eukaryotic cells?	An organised nucleus with a nuclear envelope.
What unique structures are found in prokaryotic cells?	Inclusions and mesosomes.
Where are methanogens commonly found during sewage treatment?	In anaerobic sludge.
Where are most chloroplasts found in green plants?	Mesophyll cells of leaves.
Where are Trichoderma species commonly found?	In root ecosystems.
Where is the secondary wall formed in plant cells?	On the inner side toward the membrane.
Which additional components are found in mitochondrial matrix?	RNA molecules, 70S ribosomes and protein synthesis components.
Which approach uses cell-free systems to investigate physiological and behavioural processes?	The physico-chemical approach.
Which bacteria are called Gram positive?	Bacteria that take up Gram stain.
Which bacteria are commonly found in curd?	Lactic acid bacteria (LAB).

Question	Answer
Which bacteria was Fleming working on when penicillin was discovered?	Staphylococci bacteria.
Which cells are among the longest cells in the body?	Nerve cells.
Which chloroplast membrane is less permeable?	Inner membrane.
Which face of Golgi apparatus is convex?	Cis face.
Which fungus produces Cyclosporin A?	Trichoderma polysporum.
Which gas is mainly produced during fermentation of dough, cheese making, and beverage production?	Carbon dioxide (CO2).
Which insect helps control mosquitoes naturally?	Dragonfly.
Which instrument helped scientists study the detailed structure of the cell membrane?	Electron microscope.
Which membrane-bound organelles are absent in prokaryotic cells?	ER, Golgi complex, lysosomes, mitochondria, microbodies and vacuoles.
Which microbes can be grown on nutritive media to form colonies?	Bacteria and many fungi can be grown on nutritive media to form visible colonies.
Which microorganism is mainly used in fermented beverage production?	Yeast.
Which microorganism produces statins?	Monascus purpureus.
Which molecule provides energy for active transport?	ATP.
Which non-living outer covering is present in plant cells?	Cell wall.
Which organelles are involved in protein synthesis and transport?	Rough endoplasmic reticulum and ribosomes.
Which structures are present in animal cells but absent in almost all plant cells?	Centrioles.
Which two river-cleaning programmes were initiated by the Ministry of Environment and Forests?	Ganga Action Plan and Yamuna Action Plan.
Which yeast ferments bread dough?	Saccharomyces cerevisiae.
Which yeast is used for commercial production of ethanol?	Saccharomyces cerevisiae.
Who discovered penicillin?	Alexander Fleming.

Question	Answer
Who examined many plants and observed that all plants are composed of different kinds of cells?	Matthias Schleiden.
Who explained that cells arise from pre-existing cells?	Rudolf Virchow.
Who first described the nucleus as a cell organelle?	Robert Brown.
Who first observed Golgi apparatus?	Camillo Golgi.
Who first observed ribosomes under the electron microscope?	George Palade.
Who together formulated the cell theory?	Schleiden and Schwann.
Who was G.N. Ramachandran?	An outstanding figure in the field of protein structure.
Why are biogas plants commonly built in rural areas?	Because cattle dung is available in large quantities there.
Why are chemical pesticides harmful?	They are toxic to humans and animals and pollute the environment.
Why are mitochondria not easily visible under a microscope?	Because they are not easily visible unless specifically stained.
Why are some organelles grouped as the endomembrane system?	Because their functions are coordinated.