



Holiday Homework /assignment

SECTION A: MULTIPLE CHOICE QUESTIONS*

Choose the correct option:

1. Who discovered cells by observing a cork slice?
A. Leeuwenhoek B. Robert Hooke C. Schwann D. Virchow
2. Which organelle is called the “powerhouse of the cell”?
A. Chloroplast B. Golgi body C. Mitochondria D. Lysosome
3. A student kept peeled potato in concentrated salt solution. After 2 hours it became soft. This is due to:
A. Diffusion B. Exosmosis C. Endosmosis D. Active transport
4. Why do plant cells not burst in hypotonic solution but animal cells do?
A. Animal cells have lysosomes
B. Plant cells have rigid cell wall
C. Plant cells have large vacuole
D. Animal cells lack mitochondria
5. SER differs from RER because:
A. SER has ribosomes B. RER synthesizes lipids
C. SER synthesizes lipids, RER proteins D. Both same
6. If a cell lacks ribosomes, which function will be affected most?
A. Lipid synthesis B. Protein synthesis C. Photosynthesis D. ATP production
7. Chromatin material is made of:
A. DNA only B. RNA only C. DNA + proteins D. Lipids + proteins
8. Why are lysosomes called “suicidal bags”?
A. They kill other cells
B. They burst and digest own cell when damaged
C. They store poison
D. They stop cell division
9. Which is NOT a part of nucleus?
A. Nuclear membrane B. Nucleolus C. Chromatin D. Cristae
10. Rohan observed under microscope that bacterial cells have no membrane-bound nucleus. Such cells are called:
A. Eukaryotic B. Prokaryotic C. Plant cells D. Fungal cells
11. SI unit of speed is:
A. km/h B. m/s C. cm/s D. km/min
12. If an object covers equal distances in equal intervals of time, it is said to be in:
A. Non-uniform motion B. Uniform motion C. Accelerated motion D. Circular motion
13. A ball thrown upwards comes down due to:
A. Muscular force B. Frictional force C. Gravitational force D. Magnetic force
14. Inertia of an object depends on its:
A. Volume B. Mass C. Shape D. Density
15. When you stop pedaling a bicycle, it slows down due to:
A. Gravity B. Friction C. Weight D. Inertia
16. Which of the following is a pure substance?
A. Air B. Milk C. Distilled water D. Soil
17. The process of changing solid directly into gas is called:
A. Evaporation B. Condensation C. Sublimation D. Melting
18. Smallest particle of an element that retains its properties is:
A. Molecule B. Atom C. Ion D. Compound
19. Symbol of Sodium is:
A. S B. So C. Na D. Sd
20. Water is a compound because:
A. It can be separated by physical method
B. It has properties different from hydrogen and oxygen
C. It is a mixture
D. It boils at 100°C

SECTION B: FILL IN THE BLANKS

21. The process of spontaneous movement of water from high to low water concentration through semipermeable membrane is called.....
22. When you put dried raisins in water, they swell up due to
23. Plastids containing green pigment chlorophyll are called
24. New cells arise from pre-existing cells. This part of cell theory was given by
25. The functional segments of DNA are called

SECTION C: VERY SHORT ANSWER

26. Name the smallest cell.
27. Why does a cell shrink when kept in strong sugar solution?
28. Name any two unicellular organisms.
29. Which cell organelle detoxifies poisons in liver cells?
30. If nucleolus is removed from nucleus, which process will be affected?
31. State one function of Golgi apparatus.
32. What is plasmolysis?
33. Why are nerve cells long and branched?
34. Name the process by which Amoeba takes in food.
35. Give one difference between chromatin and chromosome.

SECTION D: SHORT ANSWER

36. Radhika's mother added salt to vegetables while cooking. Radhika observed water coming out of them. Explain why.
37. Differentiate between prokaryotic and eukaryotic cells. Give 3 points.
38. Why is mitochondria called powerhouse of cell? How is its structure suited for function?
39. Draw a neat diagram of plant cell and label any 4 parts.
30. If a cell loses its lysosomes, predict two problems it will face.

SECTION E: LONG ANSWER

41. Farmers spray weeds with concentrated salt solution to kill them. Some students keep peeled cucumbers in water to make them crisp. Explain both observations using concepts of osmosis. Also explain role of cell wall in plants.
42. Describe structure and functions of nucleus. Why is it called "brain of the cell"?
43. Compare structure and function of mitochondria and chloroplast. Why are both called semi-autonomous organelles?
44. Explain structure of plasma membrane. Describe three types of transport across it with one example each.
45. Tabulate differences between plant cell and animal cell. Give 5 points. Then explain why plant cells have large vacuoles.

SECTION F: COMPREHENSION BASED QUESTIONS

46 . Case Study 1: Osmosis in Daily Life

Riya's mother was making pickle. She cut raw mangoes and added a lot of salt to them. After some time, Riya saw water collecting in the vessel. Her mother said this helps in preserving the pickle. Next day, Riya put some dried raisins in a bowl of water. In the evening, the raisins looked swollen and soft. Her younger brother put a red blood cell in pure water under a microscope and saw it burst. But when he put a plant cell in water, it became turgid but did not burst.

1. Why did water come out of raw mangoes when salt was added?
2. What process caused raisins to swell up? Name the type of solution water is for raisins.
3. Why did the red blood cell burst in pure water but plant cell did not?
4. How does osmosis help in preservation of pickles?
5. What will happen if we put a plant cell in very concentrated sugar solution? Name the phenomenon.

47 . Case Study 2: Cell Organelles and Disease

Doctors found that a patient's liver was getting damaged due to alcohol. In liver cells, smooth endoplasmic reticulum (SER) detoxifies poisons. But excess alcohol increased SER abnormally. Another patient had a genetic disorder where his cells could not make lysosomes properly. He suffered from frequent infections and his cells got filled with waste. A third patient's muscle cells were weak. Biopsy showed his mitochondria were defective, so muscles did not get enough energy. A child with greenish-yellow leaves on his money plant asked why leaves are green. His teacher showed him chloroplasts under microscope.

1. Why does SER increase in liver cells of people who drink too much alcohol?
2. Explain why the patient without proper lysosomes had waste-filled cells and infections.
3. Why were the muscle cells of third patient weak? Relate it to mitochondria.
4. Why are leaves green? Which organelle is responsible?
5. Name one organelle common in all three cases and state if it is membrane-bound.

48 . Case Study 3: Prokaryotes vs Eukaryotes

Arjun collected pond water and observed it under a microscope in school lab. He saw very tiny cells without a clear nucleus, just a dense region. His teacher said these were bacteria. He also saw Amoeba with a clear nucleus and other organelles. Later he observed onion peel cells which had cell wall, large vacuole and nucleus. His friend observed his own cheek cells which had no cell wall and no large vacuole. Teacher explained that bacteria are prokaryotes, while Amoeba, onion and cheek cells are eukaryotes. She also told that all cells come from pre-existing cells.

1. Why did bacteria not show a clear nucleus but Amoeba did?
2. List 2 differences between onion peel cells and cheek cells observed by Arjun.
3. Which cell theory statement is mentioned at the end of passage? Who gave it?
4. If bacteria and Amoeba are both unicellular, why is only Amoeba called eukaryotic?
5. Predict: Can bacteria perform photosynthesis? Explain.

(Q 49 and 50 For reading and understanding only) -

49 . COMPREHENSION 1: THE IRON TAWAA IN KITCHEN

Grandmother heats an iron tawa to make roti. Iron is a good conductor of heat, so tawa gets hot quickly. This is a physical change. But when she forgot the tawa with water on it for many days, a reddish-brown layer formed on it. This was rust, a chemical change. Her doctor said iron is also needed in our blood. Haemoglobin in RBCs contains iron and helps carry oxygen from lungs to all body cells. Deficiency of iron causes anaemia, making a person feel tired as cells get less energy.

Think?

Q 1. Why is iron preferred for making tawa instead of wood? Relate to property of matter.

Answer: Iron is a good conductor of heat, so heat transfers quickly and uniformly. Wood is insulator. This is physical property of metals._

Q 2. Write the word equation for rusting. Is it physical or chemical change? Give 1 reason.

Answer: Iron + Oxygen + Water → Hydrated Iron(III) oxide. Chemical change because new substance rust formed with different properties, irreversible._

Q 3. What is the function of iron in human body? Name the deficiency disease.

Answer: Iron is part of haemoglobin in RBCs which carries oxygen. Deficiency causes anaemia.

Q 4. Both tawa and blood need iron but for different reasons. Compare the form of iron in tawa vs blood.

Answer: In tawa iron is in elemental metallic form. In blood iron is in ionic form as part of haemoglobin molecule.

Q 5. Grandmother says heating tawa does not spoil it, but leaving it wet does. Explain using concepts of physical vs chemical change.

Answer: Heating is physical change - only temperature changes, no new substance. Rusting in wet condition is chemical change - iron reacts with O_2 and H_2O to form new substance rust, which damages tawa.

50 . COMPREHENSION 3: COOKING RICE IN PRESSURE COOKER

Mother cooks rice in a steel pressure cooker. She adds rice + water and closes lid. On heating, water boils and steam pressure increases inside. Due to high pressure, boiling point of water increases above $100^\circ C$, so rice cooks faster. This saves fuel. Rice is mainly starch, a carbohydrate. In our body, starch is broken down by saliva and other enzymes into glucose. Glucose is then oxidised in mitochondria of cells to release energy for all activities.

Q 1. Why does rice cook faster in pressure cooker? Use concepts of pressure and boiling point.

Answer: In pressure cooker, pressure increases, so boiling point of water rises $>100^\circ C$. Higher temperature cooks food faster. Pressure \propto boiling point.

Q 2. Rice is starch. What type of carbohydrate is starch? What is the basic unit of starch?

Answer: Starch is a complex carbohydrate/polysaccharide. Basic unit is glucose molecules joined together.

Q 3. Name the enzyme in saliva that breaks starch. Where does final oxidation of glucose occur in cell?

Answer: Salivary amylase. Final oxidation of glucose occurs in mitochondria during cellular respiration.

Q 4. Energy is involved in both cooking and body. Compare the source of heat energy in cooker vs energy from rice in body.

Answer: Cooker: Heat energy from LPG burning, a chemical reaction. Body: Chemical energy stored in glucose bonds released by respiration in mitochondria.

5. If the whistle of cooker is removed, will rice cook faster or slower? Explain using physics and safety.

Answer: Slower and unsafe. Whistle regulates pressure. Without it, steam escapes, pressure won't build up, boiling point stays $100^\circ C$, so cooking slows. Also risk of explosion if vent blocked.

Project work

Q 1. Draw the labelled diagram on the **chart** of TWO of the following-

A) plant cell B) animal cell C) Nucleus

Q 2. Write a short note on one of the following -

A) Sir Issac Newton B) Dr A P J Abdul kalam C) shri vikram sarabhai

Q 3. Prepare a list of plants and animals surrounding us.

CORRECT THE ERROR (Physics, Chemistry, Biology)-

One error in each statement. Underline error, write correct word/sentence.

- 1 . Speed is a vector quantity because it has direction.
- 2 . SI unit of acceleration is m/s.
3. Uniform circular motion has zero acceleration.
4. Inertia of a body increases with decrease in mass.
- 5 . 1 newton = 1 kg × m/s.
- 6 . Work done is maximum when force and displacement are perpendicular.
- 7 .Sound travels fastest in gases.
- 8 .The image formed by plane mirror is real and inverted.
- 9 . 1 horsepower = 746 kW.
- 10 . Pressure = Force × Area.
- 11 . Atomic number = number of protons + neutrons.
- 12 . Isotopes have same mass number but different atomic number.
- 13 .Water is a mixture of hydrogen and oxygen.
- 14 .Valency of carbon in CH₄ is 1.
- 15 . Melting of ice is a chemical change.
- 16 . Sodium chloride is a covalent compound.
- 17 . Molecule of ozone is O₂.
- 18 . Rusting of iron needs only oxygen.
- 19 . Pure substances have fixed boiling point.
- 20 . Cathode rays are positively charged.
- 21 . Mitochondria is called brain of the cell.
- 22 . Cell wall is present in animal cells.
- 23 . Xylem transports food in plants.
- 24 . Amoeba is a multicellular organism.
- 25 . Typhoid is caused by virus.
- 26 . Chlorophyll is present in mitochondria.
- 27 . Aerobic respiration occurs without oxygen.
- 28 . Lysosomes are called powerhouses of cell.