

# SMETA SCIENCE OLYMPIAD

SAMPLE PAPER  
GRADE 7-8



**Q1. Imagine a cell is like a factory.**

**Which organelle acts like the "security system" that controls what enters and exits the factory?**

- A) Mitochondria
- B) Nucleus
- C) Cell membrane
- D) Ribosomes

Answer: C) Cell membrane



**Q2. A scientist finds a fossilized microbe estimated to be 3.5 billion years old.**

**Which type of cell is this microbe most likely to be?**

- A) Eukaryotic plant cell
- B) Eukaryotic animal cell
- C) Prokaryotic cell
- D) A cell with a well-defined nucleus

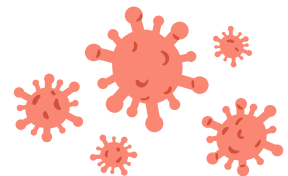
Answer: C) Prokaryotic cell

**Q3. Alex is a doctor and examines a patient with a bacterial infection. The bacteria are resistant to antibiotics and multiply quickly.**

**Which characteristic makes bacteria able to evolve faster than eukaryotic cells?**

- A) Bacteria have more mitochondria.
- B) Bacteria reproduce by binary fission, allowing rapid growth.
- C) Bacteria have larger nuclei that copy DNA faster.
- D) Bacteria have more ribosomes to produce energy.

Answer: B) Bacteria reproduce by binary fission, allowing rapid growth.

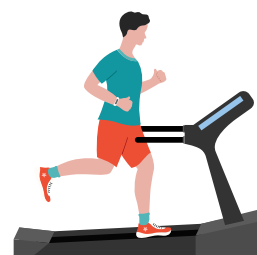


**Q4. Lorez running on a treadmill. Suddenly, they start breathing faster, their heart rate increases, and they begin sweating.**

**Which three body systems are working together to respond to this situation?**

- A) Circulatory, respiratory, and nervous
- B) Digestive, nervous, and endocrine
- C) Skeletal, muscular, and digestive
- D) Integumentary, urinary, and reproductive

Answer: A) Circulatory, respiratory, and nervous



**Q5. Labeiza is a soccer player, while playing he sees a ball coming towards him, and within a fraction of a second, he jumped to avoid getting hit.**

**Which part of the nervous system is responsible for this rapid reaction?**

- A) Brain only
- B) Spinal cord and motor neurons
- C) Endocrine glands
- D) The heart and lungs

Answer: B) Spinal cord and motor neurons



**Q6. Aira planted two different types of plants in her garden. One plant grew tall with strong stems and broad green leaves, producing colorful flowers. The other remained low to the ground with small, delicate leaves and never bloomed. She noticed that when she watered them, one plant absorbed water quickly and grew stronger, while the other stayed moist on the surface but didn't seem to transport water well.**

What could explain the difference?

- A) The first plant is a vascular plant, and the second is nonvascular.
- B) The first plant is a gymnosperm, and the second is an angiosperm.
- C) The first plant is a desert plant, and the second is an aquatic plant.
- D) Both plants are the same; they just look different.

Answer: A) The first plant is a vascular plant, and the second is nonvascular.

**Q7. One spring, Ali's apple orchard is full of beautiful flowers. But by mid-summer, he notices that the flowers have disappeared, and small green fruits have started growing in their place.**

**Ali is confused and asks his grandmother, who explains that the flowers didn't disappear but transformed into fruit.**

**Which process is responsible for this transformation?**

- A) Photosynthesis
- B) Pollination and fertilization
- C) Water absorption
- D) Germination

Answer: B) Pollination and fertilization



**Q8. Scientists studying a coral reef observe that fish populations are rapidly declining. When they investigate, they find that the temperature of the ocean water has risen by 2°C over the last decade, causing the coral reefs to turn white and die (coral bleaching).**

**How is this temperature change affecting the ecosystem?**

- A) The heat makes fish swim away from the coral.
- B) Coral reefs provide food and shelter, so when they die, fish populations decline.
- C) The fish are becoming hotter and can no longer survive.
- D) The ocean produces less salt, affecting fish survival.



Answer: B) Coral reefs provide food and shelter, so when they die, fish populations decline.

**Q9. Jackie farmer plants two fields of crops:**

- **Field A: Uses natural compost and allows earthworms to live in the soil.**
- **Field B: Uses chemical fertilizers and removes all earthworms.**

**After a year, he notices that Field A has healthier crops and richer soil, while Field B's soil becomes dry and less fertile over time.**

**What role did the earthworms play in Field A?**

- A) Earthworms eat the crops, making them grow faster.
- B) Earthworms decompose organic matter and improve soil health.
- C) Earthworms provide water to plant roots.
- D) Earthworms absorb sunlight and transfer it to the soil.

Answer: B) Earthworms decompose organic matter and improve soil health.

**Q10. Not all microorganisms are harmful—some are extremely useful! A scientist wants to test which microorganisms help in food production.**

**She prepares four different samples:**

1. **Milk + Bacteria**
2. **Flour + Yeast + Water**
3. **Fruit Juice + Mold**
4. **Sugar + Virus**

**After a few days, she notices that three of the mixtures changed positively, while one had no effect.**

**Which sample would NOT help in food production?**

- A) Milk + Bacteria
- B) Flour + Yeast + Water
- C) Fruit Juice + Mold
- D) Sugar + Virus

Answer: D) Sugar + Virus

**Q11. Imagine a world without microorganisms. If ALL bacteria, fungi, and protists suddenly disappeared, what would happen?**

- A) All humans and animals would become healthier.
- B) Decomposers would disappear, and dead material wouldn't break down.
- C) The oxygen in the air would increase.
- D) Plants would grow better without microbes.

Answer: B) Decomposers would disappear, and dead material wouldn't break down.

**Q12. Dinosaurs ruled the Earth for millions of years. Then, suddenly, they disappeared. Scientists have found evidence that around 66 million years ago, a giant asteroid hit Earth, leading to massive climate changes.**

**What is the MOST LIKELY reason dinosaurs went extinct?**

- A) The asteroid impact caused climate changes that made survival difficult.
- B) Dinosaurs were weak and couldn't adapt to new environments.
- C) Mammals hunted and killed all the dinosaurs.
- D) Dinosaurs turned into birds overnight.

Answer: A) The asteroid impact caused climate changes that made survival difficult.

**Q13. A biologist discovers an unknown creature. It lives in water, has gills, lays eggs, and has a backbone. However, it also has webbed feet and can live on land for short periods.**

**Which group of vertebrates is this organism MOST LIKELY related to?**

- A) Mammals
- B) Birds
- C) Amphibians
- D) Reptiles

Answer: C) Amphibians

**Q14. Laiza as a scientist wants to classify a newly discovered organism. It has the following traits:**

- It is multicellular
- It absorbs nutrients from dead plants
- It does not move
- It has cell walls

**Based on these characteristics, which kingdom should this organism belong to?**

- A) Animalia
- B) Plantae
- C) Fungi
- D) Protista

Answer: C) Fungi

**Q15. Nazelia is given an unknown substance. She heats it, and it changes from a solid to a liquid at  $801^{\circ}\text{C}$ . When she places it in water, the substance completely dissolves and conducts electricity.**

**Based on these observations, what is the MOST LIKELY identity of the substance?**

- A) Sugar ( $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ )
- B) Sodium chloride ( $\text{NaCl}$ )
- C) Copper ( $\text{Cu}$ )
- D) Ice ( $\text{H}_2\text{O}$ )

**Q16. During a science experiment, a teacher lights a candle and places a glass jar over it. After a few minutes, the flame goes out, and the wax appears to have disappeared.**

**Which scientific principle explains what happened to the wax?**

- A) The wax was destroyed when the candle burned.
- B) The wax was converted into gases and released into the air.
- C) The wax turned into water and absorbed into the jar.
- D) The wax was absorbed into the wick and disappeared.

Answer: B) The wax was converted into gases and released into the air.

**Q17. Alice boils a pot of water and notices that the water level decreases over time.**

**What phase change is occurring?**

- A) Condensation
- B) Sublimation
- C) Vaporization
- D) Freezing

Answer: C) Vaporization

**Q18. A new element is discovered. It has the following properties:**

- It is shiny and silver
- It is a good conductor of heat and electricity
- It is malleable (can be hammered into thin sheets)

**Which group on the Periodic Table does this element MOST LIKELY belong to?**

- A) Metals
- B) Nonmetals
- C) Noble gases
- D) Halogens

Answer: A) Metals

**Q19. In a lab experiment scientists collect an unknown gas in a test tube. They perform an experiment and find that:**

- The gas reacts violently with water
- The gas is in Group 1 of the Periodic Table

**Which gas is she MOST LIKELY working with?**

- A) Oxygen ( $O_2$ )
- B) Helium (He)
- C) Hydrogen ( $H_2$ )
- D) Sodium (Na)

Answer: C) Hydrogen ( $H_2$ )

**Q20. A chemist mixes 10 grams of baking soda with 10 grams of vinegar in a sealed container. The mixture fizzes and bubbles as it reacts. When the reaction is complete, the chemist weighs the container again and finds the total mass is still 20 grams.**

Which law does this experiment demonstrate?

- A) Law of Conservation of Mass
- B) Boyle's Law
- C) Newton's First Law
- D) Law of Conservation of Energy



Answer: A) Law of Conservation of Mass

**Q21. Deep underground, magma cools and solidifies very slowly. This allows large crystals to form within the rock.**

**Which type of igneous rock is MOST LIKELY formed?**

- A) Basalt
- B) Pumice
- C) Granite
- D) Obsidian

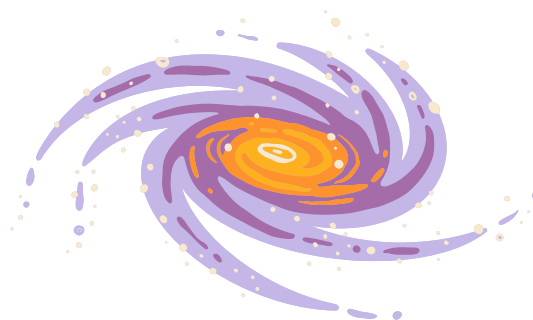
Answer: C) Granite

**Q22. Scientists observe that all galaxies are moving away from each other, and the farther a galaxy is, the faster it moves. This supports the idea that the universe is expanding.**

**What theory does this observation support?**

- A) The Steady-State Theory
- B) The Big Bang Theory
- C) The Ptolemaic Model
- D) The Multiverse Theory

Answer: B) The Big Bang Theory



**Q23. Students are performing chemical tests and has three colorless liquids labeled A, B, and C. One of them is water, one is vinegar, and one is saltwater. The Students does three tests:**

- 1** Evaporation Test: Liquid C leaves behind white crystals.
- 2** pH Test: Liquid A turns blue litmus paper red.
- 3** Taste Test: Liquid B is tasteless.

**Which liquid is vinegar?**

- A) Liquid A
- B) Liquid B
- C) Liquid C
- D) Not enough information

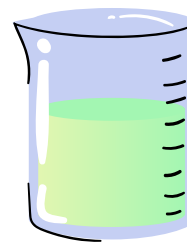
Answer: A) Liquid A

**Q24. Zaira fills a beaker with 500ml of water. She places a solid metal ball inside. The water level rises to 600ml, but when she removes the ball, the beaker now holds only 450ml.**

**What happened?**

- A) The beaker had a hidden leak.
- B) Some water evaporated.
- C) The metal ball absorbed the water.
- D) The beaker expanded due to heat.

Answer: A) The beaker had a hidden leak.



**Q25. A kid drops a feather and a metal ball from the same height in a vacuum chamber where there is no air resistance.**

**What will happen?**

- A) The metal ball will fall faster.
- B) The feather will fall faster.
- C) Both will fall at the same speed.
- D) The feather will float in the air.

Answer: C) Both will fall at the same speed

