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Everyday Science

30 Solved & Explained MCQs

Advanced-level questions for CSS • PMS • PPSC • FPSC • NTS

Each section contains one question, its ticked and highlighted correct answer, and a concise explanation to build real conceptual understanding — not just rote memorization.

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SECTION 1 | EVERYDAY SCIENCE MCQ

Q1. A metal spoon left in a cup of hot tea feels hot at the exposed end within seconds mainly due to which mode of heat transfer?

A. Convection

B. Conduction ✓

C. Radiation

D. Evaporation

CORRECT ANSWER: B ✓ | EXPLANATION

Metals have free electrons that carry thermal energy rapidly through the solid lattice; this direct particle-to-particle transfer without bulk movement of matter is conduction. Convection needs a fluid, and radiation does not require a medium or contact.

SECTION 2 | EVERYDAY SCIENCE MCQ

Q2. Why does a helium-filled balloon shrink faster overnight than an air-filled balloon of the same material?

A. Helium reacts with the balloon rubber

B. Helium atoms are smaller and diffuse through rubber pores faster ✓

C. Helium is heavier than air

D. Latex is impermeable to air but not to helium

CORRECT ANSWER: B ✓ | EXPLANATION

Helium is a very small, monatomic, inert gas, so its atoms escape through the microscopic pores of latex rubber much faster than the larger nitrogen and oxygen molecules in air, causing quicker deflation.

SECTION 3 | EVERYDAY SCIENCE MCQ

Q3. Which property of water, most responsible for moderating coastal climates, allows it to absorb large amounts of heat with only a small rise in temperature?

- A. Low density of ice
- B. High specific heat capacity ✓**
- C. High surface tension
- D. High viscosity

CORRECT ANSWER: B ✓ | EXPLANATION

Water has an unusually high specific heat capacity due to extensive hydrogen bonding, so it absorbs or releases large quantities of heat while its own temperature changes only slightly, keeping coastal areas milder than inland regions.

SECTION 4 | EVERYDAY SCIENCE MCQ

Q4. During a solar eclipse, why does the Moon's shadow on Earth's surface trace a narrow path rather than covering the whole planet?

- A. The Moon is much smaller in diameter than the Sun and Earth ✓**
- B. The Earth rotates too fast for a wider shadow
- C. The Sun's rays are always parallel
- D. The Moon's orbit is perfectly circular

CORRECT ANSWER: A ✓ | EXPLANATION

Because the Moon is far smaller than the Sun, its umbra (the region of total shadow) narrows to a small cone that only touches a limited strip of Earth's surface, producing the narrow path of totality.

SECTION 5 | EVERYDAY SCIENCE MCQ

Q5. Antibiotic resistance in bacteria most commonly spreads within a population through which mechanism?

- A. Spontaneous generation
- B. Horizontal gene transfer such as plasmid exchange ✓**
- C. Photosynthetic mutation
- D. Osmotic pressure adaptation

CORRECT ANSWER: B ✓ | EXPLANATION

Bacteria frequently share resistance genes carried on plasmids through conjugation, transformation, or transduction, allowing resistance to spread rapidly across a population even without vertical inheritance.

SECTION 6 | EVERYDAY SCIENCE MCQ

Q6. Why do stars appear to twinkle (scintillate) at night while planets generally shine with a steady light?

A. Stars are much farther and act as near point sources refracted unevenly by the atmosphere ✓

B. Planets do not emit any light of their own

C. Stars burn intermittently

D. Planets are always closer to the horizon

CORRECT ANSWER: A ✓ | EXPLANATION

Stars are so distant that they behave as point sources; their light gets bent unpredictably as it passes through turbulent layers of the atmosphere, causing twinkling. Planets are close enough to appear as tiny discs, so light from many points averages out the flicker.

SECTION 7 | EVERYDAY SCIENCE MCQ

Q7. A pressure cooker cooks food faster mainly because raising internal pressure does what to the boiling point of water?

A. Lowers it

B. Raises it ✓

C. Has no effect on it

D. Converts water directly to ice

CORRECT ANSWER: B ✓ | EXPLANATION

Boiling point rises with pressure. Sealing the cooker traps steam and raises internal pressure, which pushes water's boiling point above 100 degrees Celsius, so food cooks faster at the higher temperature.

SECTION 8 | EVERYDAY SCIENCE MCQ

Q8. What is the primary reason a microwave oven heats food but leaves most microwave-transparent containers like glass or plastic relatively cool?

A. Microwaves are absorbed by polar water molecules causing them to rotate and generate heat ✓

- B. Glass and plastic reflect all radiation
- C. Microwaves only heat solids, not liquids
- D. Container materials block microwaves entirely

CORRECT ANSWER: A ✓ | EXPLANATION

Microwave radiation excites polar molecules, mainly water, fat, and sugar, forcing them to rotate rapidly and generate frictional heat. Most glass and plastic containers lack enough polar molecules to absorb this energy, so they stay comparatively cool.

SECTION 9 | EVERYDAY SCIENCE MCQ

Q9. The greenhouse effect that keeps Earth habitable primarily works because greenhouse gases do what to infrared radiation?

A. Reflect all incoming sunlight back to space

B. Absorb and re-radiate outgoing infrared heat, trapping it in the atmosphere ✓

- C. Convert infrared radiation into ultraviolet radiation
- D. Block all incoming solar radiation

CORRECT ANSWER: B ✓ | EXPLANATION

Greenhouse gases such as carbon dioxide and methane are largely transparent to incoming visible sunlight but absorb outgoing infrared radiation emitted by Earth's surface, re-radiating part of it back down and warming the lower atmosphere.

SECTION 10 | EVERYDAY SCIENCE MCQ

Q10. Among common greenhouse gases, which has the highest global warming potential per molecule over a 100-year period, despite being present in far smaller quantities than carbon dioxide?

A. Carbon dioxide

B. Methane ✓

C. Water vapor

D. Nitrogen

CORRECT ANSWER: B ✓ | EXPLANATION

Methane traps substantially more heat per molecule than carbon dioxide over a 20 to 100 year horizon due to its stronger infrared absorption bands, even though it breaks down faster and occurs in much lower atmospheric concentration.

SECTION 11 | EVERYDAY SCIENCE MCQ

Q11. The depletion of the ozone layer is chiefly attributed to which class of industrial chemicals releasing reactive chlorine and bromine atoms in the stratosphere?

A. Carbon dioxide compounds

B. Chlorofluorocarbons (CFCs) ✓

C. Sulfur dioxide compounds

D. Nitrogen oxides only

CORRECT ANSWER: B ✓ | EXPLANATION

CFCs, once widely used in refrigerants and aerosols, drift into the stratosphere where ultraviolet light breaks them apart, releasing chlorine atoms that catalytically destroy ozone molecules, each chlorine atom capable of destroying thousands of ozone molecules.

SECTION 12 | EVERYDAY SCIENCE MCQ

Q12. Why do deserts experience extremely cold nights despite scorching daytime heat?

A. Dry air and lack of cloud cover let heat escape rapidly by radiation after sunset ✓

- B. Deserts are located farther from the Sun at night
- C. Sand absorbs no heat during the day
- D. Desert air has very high humidity that traps heat

CORRECT ANSWER: A ✓ | EXPLANATION

Dry desert air contains little water vapor to trap outgoing infrared radiation, and clear skies allow heat absorbed by the sand during the day to radiate away quickly after sunset, causing a sharp temperature drop.

SECTION 13 | EVERYDAY SCIENCE MCQ

Q13. Which principle explains why a massive steel ship floats on water despite steel being much denser than water?

A. Pascal's law

B. Archimedes' principle of buoyancy based on displaced water weight ✓

- C. Bernoulli's principle
- D. Newton's third law only

CORRECT ANSWER: B ✓ | EXPLANATION

A ship's hollow hull displaces a volume of water whose weight equals the ship's total weight. According to Archimedes' principle, the upward buoyant force from this displaced water balances gravity, so the ship floats even though steel itself is denser than water.

SECTION 14 | EVERYDAY SCIENCE MCQ

Q14. An aircraft wing generates lift mainly due to a pressure difference explained by which principle, combined with Newton's third law of reaction?

A. Bernoulli's principle: faster airflow over the curved upper surface creates lower pressure above the wing ✓

- B. Archimedes' principle of buoyancy
- C. Pascal's law of transmitted pressure
- D. The Doppler effect

CORRECT ANSWER: A ✓ | EXPLANATION

Air moving over the wing's curved upper surface travels faster and exerts lower pressure than the slower air beneath, creating a net upward force; the wing's angle of attack also deflects air downward, producing an additional reactive lift force.

SECTION 15 | EVERYDAY SCIENCE MCQ

Q15. Why does the pitch of an ambulance siren appear to rise as it approaches and drop as it moves away from a stationary listener?

- A. The siren's actual frequency changes electronically

B. The Doppler effect compresses sound waves ahead of the source and stretches them behind it ✓

- C. Sound travels faster when moving toward an observer
- D. The ambulance engine noise interferes with the siren

CORRECT ANSWER: B ✓ | EXPLANATION

As the source approaches, successive sound wave crests are emitted closer together, compressing the wavelength and raising perceived frequency (higher pitch). As it recedes, wavelengths stretch, lowering the perceived frequency, an effect known as the Doppler effect.

SECTION 16 | EVERYDAY SCIENCE MCQ

Q16. The bluish color of the daytime sky is best explained by which optical phenomenon?

A. Reflection of ocean water color

B. Rayleigh scattering, which scatters shorter blue wavelengths more than longer red wavelengths ✓

C. Absorption of red light by oxygen molecules

D. Refraction through ice crystals in clouds

CORRECT ANSWER: B ✓ | EXPLANATION

Sunlight contains all visible wavelengths, but shorter wavelengths like blue and violet scatter far more strongly off atmospheric gas molecules than longer wavelengths like red. Since our eyes are more sensitive to blue than violet, the sky appears predominantly blue.

SECTION 17 | EVERYDAY SCIENCE MCQ

Q17. Why does the sky often turn deep red or orange during sunrise and sunset?

A. Sunlight passes through a much longer atmospheric path, scattering out most blue light and leaving red wavelengths ✓

B. The Sun itself changes color at the horizon

C. Clouds reflect red light exclusively at those times

D. Ozone concentration increases at dawn and dusk

CORRECT ANSWER: A ✓ | EXPLANATION

At sunrise and sunset, sunlight travels through a much thicker slice of atmosphere before reaching an observer. Most of the shorter blue wavelengths get scattered away along this long path, leaving mainly the longer red and orange wavelengths to reach the eye.

SECTION 18 | EVERYDAY SCIENCE MCQ

Q18. A person with hypermetropia (long-sightedness/hyperopia) struggles most to see objects at which distance, and which lens corrects it?

A. Distant objects; concave lens

B. Nearby objects; convex (converging) lens ✓

C. Both near and far equally; cylindrical lens

D. Nearby objects; concave lens

CORRECT ANSWER: B ✓ | EXPLANATION

In hyperopia, the eyeball is too short or the cornea too flat, so images of nearby objects focus behind the retina, making close vision blurry. A convex lens converges light earlier, shifting the focal point forward onto the retina.

SECTION 19 | EVERYDAY SCIENCE MCQ

Q19. Which blood type is often called the 'universal donor' for red blood cell transfusions because it lacks A, B, and Rh antigens on its surface?

A. AB positive

B. O negative ✓

C. B positive

D. A negative

CORRECT ANSWER: B ✓ | EXPLANATION

O negative red blood cells carry neither A nor B antigens nor the Rh(D) antigen, so they are far less likely to trigger an immune reaction in recipients of most blood types, making O negative valuable in emergency transfusions.

SECTION 20 | EVERYDAY SCIENCE MCQ

Q20. Why do vaccines generally provide long-term protection against a specific disease after just one or a few doses?

- A. They directly kill all future pathogens on contact permanently
- B. They stimulate the immune system to produce memory cells that respond rapidly upon future exposure ✓**
- C. They alter human DNA to resist the pathogen forever
- D. They increase red blood cell count to fight infection

CORRECT ANSWER: B ✓ | EXPLANATION

Vaccines expose the immune system to a weakened, inactivated, or partial form of a pathogen, prompting B and T cells to form 'memory' populations. On future exposure to the real pathogen, these memory cells mount a much faster, stronger response before illness develops.

SECTION 21 | EVERYDAY SCIENCE MCQ

Q21. Which gas, released by certain bacteria and geological processes, is primarily responsible for the rotten-egg smell associated with some natural springs and marshes?

- A. Carbon dioxide
- B. Hydrogen sulfide ✓**
- C. Methane
- D. Nitrous oxide

CORRECT ANSWER: B ✓ | EXPLANATION

Hydrogen sulfide gas is produced when sulfate-reducing bacteria break down organic matter in low-oxygen environments such as marshes, sewers, and sulfur springs, and it is detectable by smell at extremely low concentrations.

SECTION 22 | EVERYDAY SCIENCE MCQ

Q22. Why does cutting an onion typically cause the eyes to water?

A. Onions release ammonia gas that irritates the eyes

B. A volatile sulfur compound (syn-propanethial-S-oxide) forms and reacts with eye moisture to form a mild sulfuric irritant ✓

C. Onion cells release carbon dioxide bubbles into the air

D. Onion juice is directly acidic like citrus

CORRECT ANSWER: B ✓ | EXPLANATION

Cutting an onion ruptures its cells, releasing enzymes that convert sulfur compounds into a volatile gas. When this gas reaches the eyes, it reacts with the tear film to form a mild sulfuric compound that irritates the eyes, triggering reflex tears.

SECTION 23 | EVERYDAY SCIENCE MCQ

Q23. Why is nuclear fusion, rather than nuclear fission, considered the process powering the Sun and most stars?

A. Fusion combines light nuclei like hydrogen into heavier ones, releasing enormous energy under extreme heat and pressure ✓

B. Fission of heavy elements is common in stellar cores

C. Stars burn chemically like a fire, similar to combustion on Earth

D. Stars generate energy purely through gravitational collapse alone

CORRECT ANSWER: A ✓ | EXPLANATION

In stellar cores, extreme temperature and pressure force hydrogen nuclei together to form helium, converting a small amount of mass into a huge amount of energy according to Einstein's mass-energy equivalence, unlike fission which splits heavy nuclei such as uranium.

SECTION 24 | EVERYDAY SCIENCE MCQ

Q24. Which factor best explains why the far side of the Moon (though often mistakenly called the 'dark side') is never seen from Earth?

A. The Moon does not rotate at all

B. The Moon is tidally locked, rotating once on its axis in the same time it takes to orbit Earth ✓

C. Earth's atmosphere blocks the view of one lunar side

D. The Moon's orbit is not aligned with Earth's equator

CORRECT ANSWER: B ✓ | EXPLANATION

Tidal forces between Earth and the Moon have synchronized the Moon's rotational period with its orbital period, a state called tidal locking. As a result, the same hemisphere always faces Earth, while the other side remains permanently hidden from direct view.

SECTION 25 | EVERYDAY SCIENCE MCQ

Q25. Spring tides, which produce the highest high tides and lowest low tides, occur mainly during which lunar phases?

A. First quarter and last quarter Moon

B. New Moon and Full Moon, when the Sun, Earth, and Moon are aligned ✓

C. Only during a lunar eclipse

D. Only during a solar eclipse

CORRECT ANSWER: B ✓ | EXPLANATION

During New Moon and Full Moon, the Sun and Moon are roughly aligned with Earth, so their gravitational pulls reinforce each other, producing unusually high high-tides and low low-tides known as spring tides. Quarter moons instead produce weaker neap tides.

SECTION 26 | EVERYDAY SCIENCE MCQ

Q26. Why is carbon monoxide especially dangerous even at low concentrations, more so than many other toxic gases?

- A. It has a strong odor that overwhelms the nervous system
- B. It binds hemoglobin far more strongly than oxygen, blocking oxygen transport in blood ✓**
- C. It directly damages lung tissue on contact
- D. It is heavier than air and settles near the ground

CORRECT ANSWER: B ✓ | EXPLANATION

Carbon monoxide binds to hemoglobin roughly 200 times more strongly than oxygen does, forming carboxyhemoglobin. This severely reduces the blood's oxygen-carrying capacity, causing tissue hypoxia, and it is especially dangerous because it is colorless and odorless.

SECTION 27 | EVERYDAY SCIENCE MCQ

Q27. Why does a person feel momentarily weightless at the top of a roller coaster hill or during free-fall in an elevator?

- A. Gravity briefly stops acting on the body
- B. The body and its surroundings accelerate downward together at nearly the same rate, eliminating the normal force that creates the sensation of weight ✓**
- C. Air pressure suddenly drops in that instant
- D. The heart temporarily stops pumping blood

CORRECT ANSWER: B ✓ | EXPLANATION

The sensation of weight comes from the normal force pushing back against gravity, such as a seat or floor. During free-fall, both the person and the vehicle accelerate downward under gravity at the same rate, so there is no supporting force, producing apparent weightlessness even though gravity is still fully acting.

SECTION 28 | EVERYDAY SCIENCE MCQ

Q28. The Mpemba effect refers to the surprising observation that, under certain conditions, hot water can freeze faster than cold water. Which factor is most commonly cited as contributing to this effect?

A. Hot water always weighs less than cold water

B. Faster evaporation, convection currents, and dissolved gas loss in hot water alter its cooling path ✓

C. Hot water molecules move backward in time

D. Cold water has a lower freezing point than hot water

CORRECT ANSWER: B ✓ | EXPLANATION

The Mpemba effect is attributed to several compounding factors: hot water loses volume through evaporation, develops stronger convection currents that speed heat loss, and releases more dissolved gases, all of which can, under specific conditions, let it reach freezing point sooner than cooler water. The effect remains sensitive to exact experimental conditions and is not universal.

SECTION 29 | EVERYDAY SCIENCE MCQ

Q29. Why can a sound produced deep in a valley sometimes echo back clearly, while the same sound on an open plain produces no noticeable echo?

A. Echoes require the reflected sound to travel at least about 17 meters and bounce off a hard surface, which valleys or hills provide but open plains typically lack ✓

B. Sound cannot travel in open spaces at all

C. Only valleys have air molecules capable of carrying sound

D. Echoes only occur underground

CORRECT ANSWER: A ✓ | EXPLANATION

For a distinct echo to be perceived, the reflected sound must return roughly 0.1 seconds after the original, requiring at least about 17 meters of round-trip distance to a hard reflecting surface. Valley walls or hillsides provide this reflecting surface and distance, while flat open plains usually lack a suitable reflector nearby.

Q30. Why do fizzy carbonated drinks go flat faster once opened and left in a warm room compared to being refrigerated?

A. Gas solubility in liquids decreases as temperature rises, so dissolved carbon dioxide escapes faster in warmth ✓

- B. Bottles are less airtight when warm
- C. Carbon dioxide converts to oxygen at higher temperatures
- D. Refrigeration destroys the gas molecules

CORRECT ANSWER: A ✓ | EXPLANATION

The solubility of gases in liquids decreases as temperature increases. Warmer soda holds less dissolved carbon dioxide, so it escapes into the atmosphere more quickly once the bottle is opened, causing the drink to go flat faster than when kept cold.