

AISSEE General Science

Sample Paper – 10

Duration: 30 Minutes

Maximum Marks: 50

Instructions

- This paper has **25 questions** carrying **2 marks** each. Total: **50 marks**.
- All questions are MCQs with four options (A/B/C/D). Choose the single correct answer.
- **No negative marking**. Wrong or blank answers carry zero marks.
- Attempt all questions. Do not leave any answer blank.

Section A: Human Body

Q1. The pancreas is an organ that performs two important jobs in the body. Which statement correctly describes BOTH functions of the pancreas?

- (A) It pumps blood and filters urine
- (B) It produces bile and stores vitamins
- (C) It produces digestive enzymes (for digestion) and the hormone insulin (for blood sugar control)
- (D) It produces adrenaline and controls breathing

Answer: (C)

Solution

The **pancreas** has two roles: (1) it secretes **digestive enzymes** into the small intestine to break down food, and (2) it produces the hormone **insulin**, which helps body cells absorb glucose and keeps blood sugar levels normal. Failure to produce insulin leads to diabetes.



Q2. When a person faces sudden danger or extreme stress, the body releases a hormone that speeds up the heart rate and prepares the body to either “fight or flee”. Which gland releases this hormone (adrenaline)?

- (A) Thyroid gland
- (B) Pituitary gland
- (C) Salivary gland
- (D) Adrenal gland

Answer: (D)

Solution

The **adrenal glands** (located on top of the kidneys) release **adrenaline** in response to stress or danger. Adrenaline speeds up the heart, increases blood flow to muscles, and raises alertness — the “fight-or-flight” response. The pituitary controls growth hormones; the thyroid controls metabolism.

Q3. The soft tissue found inside bones, called red bone marrow, is responsible for producing:

- (A) Digestive juices
- (B) Bile for fat digestion
- (C) Red blood cells, white blood cells, and platelets
- (D) Growth hormones

Answer: (C)

Solution

Red bone marrow manufactures all types of **blood cells**: red blood cells (carry oxygen), white blood cells (fight infection), and platelets (help blood clot). This process is called haematopoiesis. Yellow bone marrow mainly stores fat.



Q4. At the ends of bones where they meet to form a joint, there is a smooth, flexible connective tissue that reduces friction and absorbs shock during movement. This tissue is called:

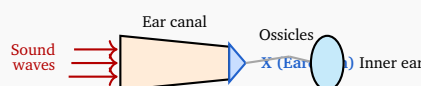
- (A) Ligament
- (B) Tendon
- (C) Muscle
- (D) Cartilage

Answer: (D)

Solution

Cartilage is a flexible, rubbery connective tissue found at the ends of bones in joints (e.g. knee, elbow). It cushions bones, reduces friction, and absorbs impact. It is softer than bone but firmer than muscle. Ligaments connect bone to bone; tendons connect muscle to bone.

Q5. The diagram shows a simplified cross-section of the human ear. What does the **tympanic membrane** (eardrum, labelled X) do when sound waves reach it?



- (A) It vibrates back and forth, converting sound waves into mechanical vibrations that pass to the inner ear
- (B) It produces the fluid that fills the ear canal
- (C) It amplifies sound before it enters the outer ear
- (D) It converts vibrations directly into nerve signals without any movement

Answer: (A)

Solution

The **tympanic membrane (eardrum)** is a thin, stretched membrane that **vibrates** when sound waves hit it. These mechanical vibrations are then passed through three small



bones (ossicles) to the inner ear, where they are converted into nerve signals sent to the brain. This is how we hear.

Q6. A person's blood group (A, B, AB, or O) is determined by specific marker proteins (antigens) found on the surface of which blood component?

- (A) White blood cells
- (B) Red blood cells
- (C) Platelets
- (D) Plasma

Answer: (B)

Solution

Blood groups (ABO system) are determined by **antigens** present on the surface of **red blood cells**. Type A has A antigens, Type B has B antigens, Type AB has both, and Type O has neither. Knowing blood groups is essential for safe blood transfusions.

Section B: Plants and Animals

Q7. Algae are simple, plant-like organisms found in water. How are algae *different* from most land plants?

- (A) They are aquatic and lack true roots, stems, and leaves
- (B) They produce seeds enclosed in fruits
- (C) They have vascular tissue (xylem and phloem) to transport water
- (D) They perform respiration but cannot photosynthesise

Answer: (A)

Solution

Algae are simple aquatic organisms that have no true roots, stems, or leaves — they are **non-vascular** and **rootless**. They can be unicellular (like *Chlamydomonas*) or multicellular (like seaweed). They still photosynthesise using chlorophyll and are major oxygen producers in aquatic ecosystems.



Q8. Lichens are *pioneer organisms* that grow on bare rocks and are often the first living things to colonise a new surface. A lichen is actually:

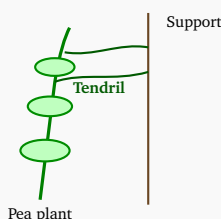
- (A) A type of moss
- (B) A partnership (symbiosis) between a fungus and an alga living together
- (C) A type of fern
- (D) A single-celled animal

Answer: (B)

Solution

A **lichen** is a **symbiotic** partnership between a **fungus** (which provides structure and absorbs water/minerals) and an **alga** (which photosynthesises and provides food). They are pioneer organisms because they can survive on bare rock, slowly breaking it down into soil, allowing other plants to grow later.

Q9. The diagram shows a pea plant with its leaf modified into thin coiling structures called **tendrils**. What is the main function of these tendrils?



- (A) To absorb sunlight for photosynthesis
- (B) To absorb water from the soil
- (C) To store food for the plant
- (D) To help the plant climb a support and hold itself upright

Answer: (D)

Solution

Tendrils in pea plants are modified leaflets that coil around a support (fence, twig, etc.) to help the plant **climb and hold itself upright**. In a cactus, leaves are modified into **spines** to reduce water loss and provide protection. Leaf modifications are adaptations



to the plant's environment.

Q10. Plants that have special tube-like tissues (xylem to carry water, phloem to carry food) throughout their body are called:

- (A) Non-vascular plants (e.g. mosses, liverworts)
- (B) Vascular plants (e.g. ferns, conifers, flowering plants)
- (C) Parasitic plants only
- (D) Aquatic plants only

Answer: (B)

Solution

Vascular plants have xylem and phloem — a proper plumbing system to transport water and nutrients over long distances. This allows them to grow tall. **Non-vascular plants** (mosses, liverworts) lack this system and must absorb water directly through their surfaces, so they stay small and low.

Q11. Forests play a vital role in the water cycle. Which statement correctly describes how forests contribute to the water cycle?

- (A) Forests completely prevent rain from falling
- (B) Forests remove all water from the soil permanently
- (C) Forests release water vapour through transpiration, which forms clouds and eventually causes rainfall
- (D) Forests convert water molecules into carbon dioxide

Answer: (C)

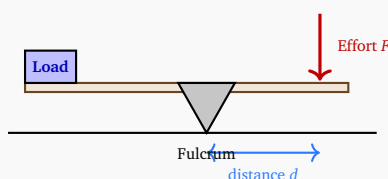
Solution

Trees release large amounts of water vapour through **transpiration** from their leaves. This water vapour rises, cools, condenses into clouds, and falls as **rain**. Forests also hold soil (preventing erosion), allow rainwater to seep into the ground (recharge groundwater), and reduce flooding. Deforestation disrupts the water cycle and can cause droughts.

Section C: Force, Motion, and Simple Machines



Q12. The diagram shows a lever (like those used in a catapult or trebuchet). The *moment of force* (torque) produced about the fulcrum is calculated as:



- (A) Force $\div$ distance from fulcrum
- (B) Force $\times$ distance from fulcrum
- (C) Force $+$ distance from fulcrum
- (D) Force $-$ distance from fulcrum

Answer: (B)

Solution

The **moment of force** (torque) = $F \times d$, where F is the applied force and d is the perpendicular distance from the fulcrum. A larger distance gives a greater turning effect for the same force. Catapults and trebuchets use this principle — a long throwing arm multiplies the torque.

Q13. Newton's Law of Universal Gravitation states that:

- (A) Every object in the universe attracts every other object with a gravitational force that depends on their masses and the distance between them
- (B) Only the Earth has a gravitational force; other objects do not attract each other
- (C) Gravity only exists in outer space and not on Earth's surface
- (D) Gravitational force does not depend on the mass of objects

Answer: (A)



Solution

Newton's **Universal Gravitation** states that **every mass attracts every other mass**. The force increases with greater mass and decreases with greater distance. This is why planets orbit the Sun, the Moon orbits Earth, and we are held to the ground. Even two people standing apart attract each other — but the force is far too small to notice.

Q14. Ocean tides — the regular rise and fall of sea level — are mainly caused by:

- (A) The gravitational pull of the Moon on Earth's oceans
- (B) The rotation of the Earth on its own axis
- (C) Winds blowing across the ocean surface
- (D) The Sun evaporating large amounts of sea water

Answer: (A)

Solution

Tides are primarily caused by the **Moon's gravitational pull** on Earth's oceans. The side of Earth facing the Moon experiences a stronger pull, causing a high tide; a corresponding high tide also occurs on the opposite side. The Sun also contributes to tides, but the Moon's effect is stronger because it is much closer.

Q15. Inventors have long dreamed of a “perpetual motion machine” — one that keeps running forever without any energy input. Why is such a machine *impossible*?

- (A) No engineer has yet been clever enough to design one
- (B) Energy is always lost to friction and heat, so any real machine will eventually slow down and stop
- (C) Machines can only run using electricity, not mechanical energy
- (D) Motion automatically creates more energy than it uses

Answer: (B)

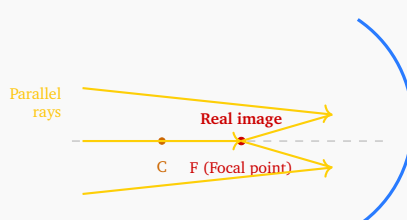


Solution

A perpetual motion machine violates the **Law of Conservation of Energy**. In any real machine, **friction** converts some mechanical energy into **heat**, which is lost to the surroundings. Without a continuous energy input, the machine slows down and stops. No machine can create energy from nothing.

Section D: Light, Sound, Heat, and Chemistry

Q16. The diagram shows parallel rays of light hitting a concave (curved inward) mirror. Concave mirrors are used in solar cookers and reflecting telescopes because they:



- (A) Scatter reflected light in all directions
- (B) Can only form virtual, upright images
- (C) Reflect all light away from the focal point
- (D) Converge (focus) reflected rays to form a bright, real image at the focal point

Answer: (D)

Solution

A **concave mirror** curves inward and **converges** all parallel incoming rays to a single point called the **focal point**, forming a **real image** there. In a solar cooker, this concentrated heat cooks food. In a reflecting telescope, it collects and focuses starlight. Convex mirrors, by contrast, diverge rays and always form virtual images.



Q17. On the Celsius scale, water boils at 100°C . What is this temperature on the Fahrenheit scale?

- (A) 32°F
- (B) 180°F
- (C) 212°F
- (D) 273°F

Answer: (C)

Solution

The conversion formula is: $^{\circ}\text{F} = (^{\circ}\text{C} \times \frac{9}{5}) + 32$. For 100°C : $(100 \times 1.8) + 32 = 180 + 32 = 212^{\circ}\text{F}$. Key reference points: water freezes at 0°C (32°F) and boils at 100°C (212°F).

Q18. A chemical reaction in which heat energy is *absorbed* from the surroundings (making the surroundings feel cold) is called:

- (A) An endothermic reaction
- (B) An exothermic reaction
- (C) A combustion reaction
- (D) A neutralisation reaction

Answer: (A)

Solution

An **endothermic** reaction *absorbs* heat from the surroundings — the mixture becomes cold (e.g. dissolving ammonium nitrate in water, used in instant cold packs). An **exothermic** reaction *releases* heat (e.g. burning, rusting, neutralisation). *Endo* = “within/absorb”; *exo* = “outside/release”.



Q19. “Hard water” is water that does not lather easily with soap and leaves a white scum. The hardness is caused by dissolved:

- (A) Common salt (sodium chloride) only
- (B) Calcium and magnesium salts
- (C) Sugar
- (D) Nitrogen gas

Answer: (B)

Solution

Hard water contains dissolved **calcium** (Ca^{2+}) and **magnesium** (Mg^{2+}) salts, which react with soap to form an insoluble scum instead of lather. Hard water also forms “scale” (limescale) inside kettles and pipes. It can be softened by boiling (temporary hardness) or by using water softeners.

Q20. Carbon is a single element that exists in two very different pure solid forms — the extremely hard *diamond* and the soft, slippery *graphite*. The property of an element existing in two or more distinct physical forms is called:

- (A) Isotopy
- (B) Isomerism
- (C) Polymorphism
- (D) Allotropy

Answer: (D)

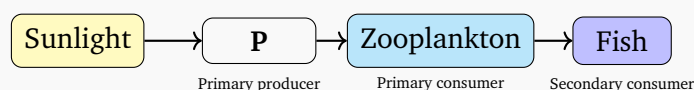
Solution

Allotropy is the existence of an element in more than one physical form (allotropes) in the same state. Carbon’s allotropes are **diamond** (each carbon bonded to four others in a rigid lattice — extremely hard) and **graphite** (carbon in flat layers that slide easily — used as a lubricant and in pencil leads). Fullerenes (e.g. Buckminsterfullerene) are a third allotrope.

Section E: Environmental Science



Q21. The diagram shows a simplified marine (ocean) food chain. Which organism at position **P** acts as the *primary producer* — making food from sunlight — in a marine ecosystem?



- (A) Sharks
- (B) Jellyfish
- (C) Phytoplankton (microscopic algae that photosynthesise)
- (D) Crabs

Answer: (C)

Solution

Phytoplankton are microscopic algae (plant-like organisms) that float in sunlit surface waters and **photosynthesise** — they are the **primary producers** of the marine ecosystem. They form the base of almost all ocean food chains. Phytoplankton also produce about half of the Earth's atmospheric oxygen.

Q22. When an oil spill occurs in the ocean, what is the most immediate physical harm caused to seabirds and marine mammals (such as otters and seals)?

- (A) Oil coats their feathers or fur, destroying insulation and making it harder for them to float and stay warm
- (B) The oil makes the surrounding seawater much colder than usual
- (C) The oil blocks sunlight completely for many years
- (D) The oil rapidly converts dissolved oxygen into carbon dioxide, suffocating all fish

Answer: (A)

Solution

Oil coats the **feathers of seabirds** and the **fur of marine mammals**, destroying the waterproofing and insulation that keeps them warm. Animals lose body heat rapidly



(hypothermia) and can no longer float properly. They also ingest oil while grooming, causing internal poisoning. Oil spills devastate marine ecosystems and coastlines.

Q23. The “urban heat island” effect describes the fact that cities are significantly *warmer* than the surrounding countryside. The main reason for this is:

- (A) Dark-coloured roads and buildings absorb more solar heat, and reduced vegetation means less cooling by transpiration
- (B) Cities are built at higher altitudes, which are warmer
- (C) Cities produce more rainfall, which releases latent heat
- (D) Urban areas have more trees that block cooling breezes

Answer: (A)

Solution

Cities are warmer because: (1) **dark surfaces** (asphalt, concrete, rooftops) absorb and store more solar heat than soil or vegetation; (2) **fewer trees** means less cooling from transpiration and shade; (3) waste heat from vehicles, air conditioners, and factories adds to the effect. Planting urban trees and using light-coloured rooftops can reduce the urban heat island.

Q24. A photovoltaic (PV) solar panel converts:

- (A) Heat energy from the Sun into mechanical energy
- (B) Wind energy into electrical energy
- (C) Light energy from the Sun directly into electrical energy
- (D) Chemical energy stored in silicon into light energy

Answer: (C)

Solution

A **photovoltaic (PV) cell** uses the **photoelectric effect** to convert **light** (photons from the Sun) directly into **electricity**. When photons strike a semiconductor (usually silicon), they knock electrons loose, creating an electric current. PV panels produce no greenhouse gases during operation and are a key renewable energy technology.



Q25. Nuclear power plants generate large amounts of electricity by splitting uranium atoms (nuclear fission) without burning fossil fuels. Which of the following is a major *disadvantage* of nuclear energy?

- (A) It releases large amounts of carbon dioxide into the atmosphere
- (B) It requires strong winds to generate power
- (C) It uses enormous quantities of freshwater in the form of ice
- (D) It produces radioactive waste that remains dangerous for thousands of years and is very difficult to store safely

Answer: (D)

Solution

Nuclear energy pros: generates huge amounts of electricity, produces **no** CO_2 during operation (low carbon footprint), and takes up little land. **Nuclear energy cons:** produces **radioactive waste** that remains hazardous for thousands to millions of years and requires secure long-term storage; risk of accidents (e.g. Chernobyl, Fukushima); high construction cost; mining uranium has environmental impacts.

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	C	2	D	3	C	4	D	5	A
6	B	7	A	8	B	9	D	10	B
11	C	12	B	13	A	14	A	15	B
16	D	17	C	18	A	19	B	20	D
21	C	22	A	23	A	24	C	25	D

