

AISSEE General Science

Sample Paper – 4

Duration: 30 Minutes

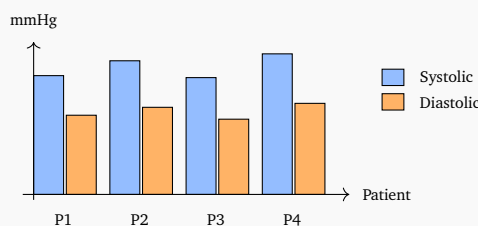
Maximum Marks: 50

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 bar chart shows blood pressure readings for four patients. Blood pressure is measured in mmHg (millimetres of mercury). Which instrument is used to measure blood pressure?



- (A) Thermometer
- (B) Stethoscope
- (C) Glucometer
- (D) Sphygmomanometer

Answer: (D)

Solution

A **sphygmomanometer** measures blood pressure. It gives two readings: the *systolic* pressure (when the heart beats) and the *diastolic* pressure (when the heart rests). Normal blood pressure is about 120/80 mmHg. A thermometer measures temperature; a glucometer measures blood sugar.



Q2. Muscles in the human body can be voluntary or involuntary. Which of the following is an example of a *voluntary* muscle?

- (A) Heart muscle
- (B) Muscles of the stomach wall
- (C) Biceps muscle in the arm
- (D) Muscles of the intestine

Answer: (C)

Solution

Voluntary muscles are under conscious control – we decide when to move them. The **biceps** in the arm is a voluntary (skeletal) muscle. The heart, stomach, and intestine contain *involuntary* (smooth or cardiac) muscles that work automatically without conscious effort.

Q3. The human body contains glands that produce chemical messengers called hormones. Which gland produces **insulin**, the hormone that regulates blood sugar?

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

Answer: (D)

Solution

The **pancreas** produces **insulin**, which lowers blood glucose after a meal, and **glucagon**, which raises blood glucose when it is too low. The thyroid gland produces thyroxine; the adrenal glands produce adrenaline; the pituitary is the “master gland” that controls other glands.



Q4. The spine (backbone) is a column of small bones called vertebrae. What is its most important protective function?

- (A) It pumps blood around the body
- (B) It produces red blood cells
- (C) It protects the spinal cord
- (D) It filters waste from the blood

Answer: (C)

Solution

The **spine** encloses and protects the **spinal cord** – the bundle of nerves that connects the brain to the rest of the body. Damage to the spinal cord can cause paralysis. The spine also supports the body's weight and allows flexible movement.

Q5. The diagram shows three types of blood cells. What is the main function of **platelets** (labelled **Z**)?



- (A) Carry oxygen to body cells
- (B) Fight bacterial infections
- (C) Help blood clot to stop bleeding
- (D) Produce hormones

Answer: (C)

Solution

Platelets (thrombocytes) help **blood clot** when a blood vessel is cut, stopping bleeding and allowing wounds to heal. Red blood cells (X) carry oxygen; white blood cells (Y) fight infection. Platelets are not cells but small cell fragments produced in bone marrow.



Q6. The wall of the human heart is made of a special type of muscle that beats continuously without tiring. What is this muscle type called?

- (A) Cardiac muscle
- (B) Skeletal muscle
- (C) Smooth muscle
- (D) Voluntary muscle

Answer: (A)

Solution

The heart wall is made of **cardiac muscle**, a unique involuntary muscle found only in the heart. It contracts rhythmically about 70 times per minute throughout a lifetime without fatigue. Skeletal muscles move bones; smooth muscle lines organs like the stomach.

Section B: Plants and Animals

Q7. Water is pulled upward through the xylem from roots to leaves in a plant. Which process at the leaf surface drives this upward movement by releasing water vapour?

- (A) Photosynthesis
- (B) Respiration
- (C) Osmosis
- (D) Transpiration

Answer: (D)

Solution

Transpiration is the evaporation of water vapour through tiny pores called *stomata* on the leaf surface. This loss of water creates a “pull” that draws water upward through the xylem from the roots – this is called the transpiration stream. It also helps cool the plant.



Q8. Plants can be grouped as flowering and non-flowering. Which of the following is a *non-flowering* plant?

- (A) Rose
- (B) Mango tree
- (C) Fern
- (D) Sunflower

Answer: (C)

Solution

A **fern** is a non-flowering plant – it reproduces using spores, not seeds or flowers. Other non-flowering plants include mosses, liverworts, and algae. Rose, mango, and sunflower are all *flowering plants* (angiosperms) that produce flowers and seeds.

Q9. After a flower is pollinated, a fruit develops around the seeds. Which part of the flower develops into the fruit?

- (A) Petal
- (B) Ovary
- (C) Sepal
- (D) Stamen

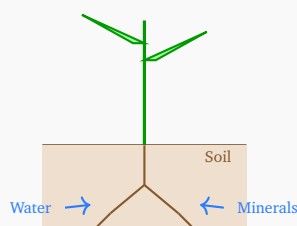
Answer: (B)

Solution

The **ovary** of the flower develops into the **fruit** after fertilisation. The ovules inside the ovary develop into seeds. Petals attract pollinators; sepals protect the bud before it opens; stamens produce pollen. So a fruit is a ripened ovary containing seeds.



Q10. The diagram shows a plant with its roots in the soil. What are the TWO main functions of roots?



- (A) Absorb water from soil and anchor the plant
- (B) Make food using sunlight
- (C) Release oxygen into the air
- (D) Carry food to the leaves

Answer: (A)

Solution

The two main functions of roots are: (1) to **absorb water and dissolved minerals** from the soil, and (2) to **anchor the plant** firmly in the ground. Roots grow down into the soil due to gravity. Food is made by leaves (not roots), oxygen is released by leaves, and food is transported by the phloem.

Q11. Flowering plants are classified as monocots or dicots based on the number of seed leaves (cotyledons) in their seeds. A plant with *two* cotyledons is called a:

- (A) Monocot
- (B) Gymnosperm
- (C) Alga
- (D) Dicot

Answer: (D)

Solution

A plant with **two cotyledons** (seed leaves) is called a **dicot** (dicotyledon). Examples: beans, peas, sunflowers, roses. A *monocot* has only one cotyledon – examples include grass, rice, wheat, and maize. Gymnosperms (like pine trees) produce naked seeds;



algae are non-flowering aquatic plants.

Section C: Force, Motion, and Simple Machines

Q12. The diagram shows a box with two equal forces pushing from opposite sides. When the forces on an object are *balanced* like this, what happens to the object?



- (A) It remains at rest or continues moving at constant speed
- (B) It accelerates in one direction
- (C) It always stops immediately
- (D) It changes direction randomly

Answer: (A)

Solution

When forces are **balanced** (equal and opposite), the **net force is zero**. According to Newton's first law, the object stays at rest if it was already still, or keeps moving at the **same speed in the same direction** if it was already moving. Only an *unbalanced* force causes acceleration or a change in direction.

Q13. Speed is calculated using the formula: $\text{Speed} = \text{Distance} \div \text{Time}$. A car travels **120 km** in **2 hours**. What is its average speed?

- (A) 240 km/h
- (B) 60 km/h
- (C) 30 km/h
- (D) 122 km/h

Answer: (B)



Solution

Using the formula: $\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{120 \text{ km}}{2 \text{ h}} = 60 \text{ km/h}$. Always check units – distance in km, time in hours gives speed in km/h. This formula is used in everyday situations such as finding how fast a train or car is moving.

Q14. Whether an object floats or sinks in water depends on its *density* compared with water's density. An object will *float* in water if its density is:

- (A) Equal to the density of water
- (B) Less than the density of water
- (C) Greater than the density of water
- (D) Exactly zero

Answer: (B)

Solution

An object **floats** when its density is **less than** that of water (density of water = 1 g/cm^3). For example, wood (density $\approx 0.5 \text{ g/cm}^3$) floats; iron (density $\approx 7.9 \text{ g/cm}^3$) sinks. This principle – **buoyancy** – was discovered by Archimedes: an object immersed in a fluid experiences an upward force equal to the weight of fluid displaced.

Q15. Pressure depends on both force and the area over which it acts. The correct formula for pressure is:

- (A) Pressure = Force $\times$ Area
- (B) Pressure = Force + Area
- (C) Pressure = Force $\div$ Area
- (D) Pressure = Force – Area

Answer: (C)

Solution

Pressure = $\frac{\text{Force}}{\text{Area}}$. A large force over a small area gives high pressure (e.g. a sharp knife cuts easily). The same force over a large area gives low pressure (e.g. snowshoes spread weight so you don't sink into snow). Pressure is measured in Pascals (Pa) in the



SI system.

Section D: Light, Sound, Heat, and Chemistry

Q16. The diagram shows two types of curved mirrors. A *concave* mirror curves **inward** and converges (focuses) light. In which device is a concave mirror used to produce a strong, focused beam?



- (A) Rear-view mirrors in vehicles
- (B) Torches and vehicle headlights
- (C) Shop security mirrors
- (D) Periscopes

Answer: (B)

Solution

A **concave mirror** converges (focuses) light to a point. When a light source is placed at the focus, the reflected rays form a **parallel beam** – this is used in **torches and vehicle headlights**. Convex mirrors diverge light to give a wide field of view and are used in rear-view mirrors and shop security mirrors. Periscopes use flat mirrors.

Q17. The *pitch* of a sound tells us how high or low the sound is. A sound with a *HIGH* frequency has:

- (A) Low pitch and long wavelength
- (B) High pitch and short wavelength
- (C) Low pitch and short wavelength
- (D) No pitch at all

Answer: (B)



Solution

High frequency means more vibrations per second, which produces a **high pitch** sound (e.g. a whistle or bird song). High-frequency waves are also closely packed, so they have a **short wavelength**. Low-frequency sounds (e.g. a drum) have low pitch and long wavelength. Frequency is measured in Hertz (Hz).

Q18. Iron left in damp air slowly turns reddish-brown due to rusting. Rusting is an example of which type of change?

- (A) A physical change
- (B) A reversible change
- (C) A change in state only
- (D) A chemical change

Answer: (D)

Solution

Rusting of iron is a **chemical change** – iron reacts with oxygen and water to form iron oxide (rust), a completely new substance. It is *irreversible*: you cannot turn rust back into shiny iron simply by cooling or pressing. Physical changes (like melting ice) are usually reversible and do not produce new substances.

Q19. When a piece of wood is burned in a fireplace, it turns to ash, smoke, and gases. This is:

- (A) A physical change
- (B) An irreversible chemical change
- (C) A reversible change
- (D) A change in state only

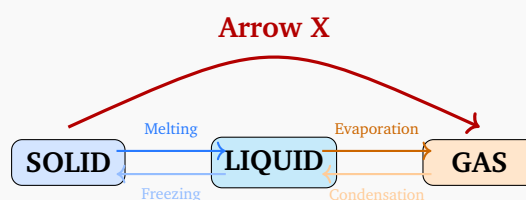
Answer: (B)

Solution

Burning is an **irreversible chemical change**. New substances (ash, smoke, carbon dioxide, water vapour) are formed that cannot be turned back into wood. Energy is released as heat and light. Unlike melting or dissolving – which are physical, reversible changes – burning permanently destroys the original material.



Q20. The diagram shows state changes. Which arrow (X) represents the process where a solid changes DIRECTLY into a gas, skipping the liquid stage altogether?



- (A) Sublimation
- (B) Evaporation
- (C) Condensation
- (D) Melting

Answer: (A)

Solution

Sublimation is the direct conversion of a solid into a gas without passing through the liquid stage. Examples include *camphor* (disappears slowly in open air), *dry ice* (solid CO_2 turns to gas), and *naphthalene* (mothballs). The reverse process – gas to solid directly – is called *deposition*.

Section E: Environmental Science

Q21. Scientists study ecosystems to understand how living and non-living things interact. Which of the following BEST defines an ecosystem?

- (A) Only the living organisms (plants and animals) in an area
- (B) Only the non-living things such as soil, water, and air
- (C) Only the food chains in a habitat
- (D) All living organisms AND their non-living environment together

Answer: (D)



Solution

An **ecosystem** includes **all living organisms** (plants, animals, fungi, microbes) *and* their **non-living environment** (soil, water, air, sunlight, temperature) in a given area, and all the interactions among them. Examples: a pond, a forest, a desert, or even a drop of pond water.

Q22. Many species of wild animals and plants are threatened with extinction today. What is the single most important cause of this biodiversity loss?

- (A) Destruction and loss of natural habitats
- (B) Increase in rainfall
- (C) More hours of sunlight each year
- (D) Increase in atmospheric oxygen levels

Answer: (A)

Solution

The greatest threat to biodiversity worldwide is **habitat loss and destruction** – clearing forests for farms, draining wetlands, and building cities removes the places where wild species live, feed, and breed. Other threats include hunting, pollution, invasive species, and climate change, but habitat loss is the primary driver of species extinction.

Q23. Natural resources can be classified as renewable or non-renewable. Which of the following is a *renewable* natural resource?

- (A) Coal
- (B) Petroleum (crude oil)
- (C) Sunlight
- (D) Natural gas

Answer: (C)

Solution

Sunlight is a **renewable** resource – it is continuously available and cannot be used up. Coal, petroleum, and natural gas are *non-renewable* fossil fuels formed over millions of



years; once burned, they cannot be replaced on a human timescale. Other renewable resources include wind, water, and biomass.

Q24. Acid rain forms when sulphur dioxide and nitrogen oxides released by burning fossil fuels dissolve in rainwater. Which of the following correctly describes the harmful effects of acid rain?

- (A) Damages forests, acidifies lakes, and corrodes buildings and statues
- (B) Increases crop production and improves soil fertility
- (C) Purifies drinking water by killing bacteria
- (D) Reduces air pollution and clears smog

Answer: (A)

Solution

Acid rain (pH below 5.6) causes widespread damage: it **kills trees** in forests, **acidifies lakes and rivers** (harming fish and aquatic life), **corrodes marble and limestone buildings and statues** (e.g. the Taj Mahal), and leaches nutrients from soil, reducing its fertility. It is caused by industrial and vehicle emissions of SO_2 and NO_x .

Q25. Water pollution poses a serious threat to human health and aquatic ecosystems. Which of the following is a major source of water pollution?

- (A) Discharge of untreated sewage and industrial waste into rivers
- (B) Planting more trees along riverbanks
- (C) Using solar energy instead of coal for electricity
- (D) Constructing rainwater harvesting pits

Answer: (A)

Solution

A major source of water pollution is the **discharge of untreated sewage and industrial effluents** into rivers, lakes, and oceans. This introduces pathogens, toxic chemicals, and excess nutrients (causing algal blooms that deplete oxygen). Other sources include agricultural runoff (pesticides and fertilisers) and oil spills. Planting trees, solar energy, and rainwater harvesting all *protect* the environment.



Answer Key

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

