

Section A

(Multiple Choice Questions)

Choose the best alternative to the following questions and write in the answer sheet

1.

a. Which of the following is an audio file format?

- i. SVI ii. WAV iii. MOV iv. 3GP

Answer: ✓ ii. WAV

Explanation: WAV is a standard format for storing **audio/sound files**. Others like MOV and 3GP are mainly **video formats**.

b. which of the following is the features of Aves?

- i. Respire through gills
ii. Poikilothermic
iii. viviparous
iv. have break and feathers

Answer: ✓ iv. Have beak and feathers

Explanation: Birds (Aves) are **warm-blooded, lay eggs, have feathers and beaks**. They **do not respire through gills** and are **homeothermic**, not poikilothermic.

c. In the given figure, What is the upthrust given by liquid on the immersed body?

- ii. 65N i. 50N iii. 35N iv. 15N

Answer: ✓ 15 N

Explanation: Upthrust = **weight of liquid displaced** (Archimedes' principle).
From the figure, the correct value is **15 N**.

d. For how long does stone remain in air when it is thrown upward with an initial velocity of 20m/s?

- i. 2 s ii. 4 s iii. 10 s iv. 20 s

$$-g = v-u/t$$

$$-10 = 0-20 / t$$

$$-10 = -20 / t$$

$$t = 2s$$

Total time of flight = $2 \times$ (time to reach maximum height).

So 4s.

e. If equal heat is supplied in equal mass of water and kerosene, Which of the following facts is correct?

- i. Kerosene has higher temperature than water.
ii. Both of them have same temperature.
iii. Kerosene has lower temperature than water.
iv. Heat does not affect temperature.

Answer: ✓ i. Kerosene has higher temperature than water

Explanation: Kerosene has **lower specific heat capacity** than water → its temperature rises **more for the same heat supplied**.

g. If a current carrying conductor is placed in a permanent magnetic field, the conductor vibrates. What is such effect called?

i. Magnetic effect

ii. Effect of electromagnetic induction

iii. Motor effect

iv. Mutual induction effect

Answer: ✓ iii. Motor effect

Explanation: A conductor carrying current experiences **force in a magnetic field**, causing motion → called **motor effect**.

Group B

Write the fundamental units included in the unit of force.

Answer: $\text{kg} \cdot \text{m} \cdot \text{s}^{-2}$ (kilogram, meter, second)

Write a similarity in Aves and mammals.

Aves and mammals are **warm-blooded (homeothermic)** and **have lungs for respiration**.

Mention any one important suggestion preserve endangered animals.

Protect their **natural habitats** and **stop poaching**.

Write an instrument based on Pascal's law.

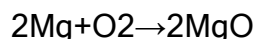
Hydraulic press (or hydraulic lift).

Mention one benefit of anomalous expansion of water.

Allows **ice to float**, preventing **lakes and rivers from freezing completely**, thus protecting aquatic life.

Write a balanced chemical equation of formation of white powder after burning a magnesium ribbon.

Answer:



(Magnesium oxide is the white powder formed.)

Group C

What are the dependent and independent variable included when a piece of paper is thrown with stretched rubber?

1. Dependent and independent variables when a piece of paper is thrown with stretched rubber

Independent variable: The **stretch of the rubber** (how much it is pulled)

Dependent variable: The **distance the paper travels**

Write any two differences between rat and snake on the basis of heart and reproduction.

Feature	Rat	Snake
Heart	4-chambered	3-chambered
Reproduction	Viviparous / gives birth to young	Oviparous / lays eggs

Honey bee is a useful insect. Justify the statement with two points.

Pollination: Helps in fertilization of plants and improves crop yield.

Honey production: Produces honey and beeswax, which are useful to humans.

Mention any two suggestions for maximum use of medicinal plants in local level.

Grow medicinal plants in home gardens for easy access.

Educate local communities on identification and use of medicinal plants.

What mass can be lifted by a person on the Moon if he can lift 100kg mass on the Earth? Calculate.

Write any two effects of gravity.

Soln;

$$W_e = W_m$$

$$M_e \times g_e = M_m \times g_m$$

$$100 \times 9.8 = M_m \times 1.6$$

$$M_m = 612.5\text{kg}$$

Two effects of gravity

Keeps planets and satellites in their **orbits**.

Causes **fall of objects** and gives **weight to objects**.

Find the amount of heat needed to increase the temperature of 8kg water from 30°C to 48°C. (The specific capacity of water is 4200 J/Kg°C).

$$Q = mS\Delta t$$

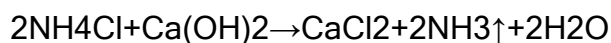
$$Q = 8 \times 4200 \times 18$$

$$Q = 604800\text{J}$$

Write any two difference between closed universe and open universe.

Feature	Closed Universe	Open Universe
Shape	Spherical	Hyperbolic
Fate	Will eventually collapse	Expands forever

Write the chemical reaction that occurs between ammonium chloride and calcium hydroxide and balance it.



Group D

Write any two positive and negative impacts of digital technology. (Repeated)

Study the electronic configuration of two elements A and B and answer the asked questions.

A = 1s², 2s² 2p⁶, 3s² 3p⁶, 4s¹

B = 1s², 2s² 2p⁶, 3s² 3p⁵

- Which of the given element is metal?
- Write the period of element B on the basis of modern periodic table.
- Write a balanced chemical equation occurred when element A combine with element B.

Given electron configurations

A: 1s² 2s² 2p⁶ 3s² 3p⁶ 4s¹ → A = Sodium (Na)

B: 1s² 2s² 2p⁶ 3s² 3p⁵ → B = Chlorine (Cl)

Answer: ✓ Element A (Sodium, Na)

Explanation: Sodium is a metal because it loses one electron to form Na^+ and shows metallic properties.

ii. Period of element B

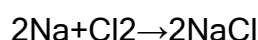
Element B = Chlorine \rightarrow electron configuration ends in $3p^5$

($n = 3$) indicates Period 3

✓ **Answer:** Period 3

iii. Balanced chemical equation when A combines with B

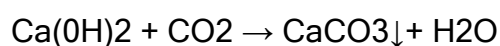
Sodium reacts with chlorine to form sodium chloride (NaCl)



A student prepared a gas by using egg shells due to lack of calcium carbonate in laboratory.

i. Write a balanced chemical equation of the reaction when gas is passed into lime water.

i. Balanced chemical equation when CO_2 is passed into lime water



Observation: Lime water turns milky due to formation of CaCO_3 .

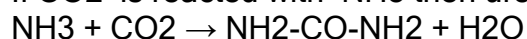
ii. Write an application of the gas in medical field.

It is used for treatment of respiratory disorders.

iii. Write the molecular formula of the compound when the gas is reacted with the gas having molecular mass 17 a.m.u

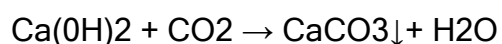
Gas with 17 a.m.u = Ammonia

If CO_2 is reacted with NH_3 then urea is formed.



iv. How is the gas tested?

Passing the gas through lime water (Ca(OH)_2) \rightarrow turns milky due to CaCO_3 formation.



The number of secondary coil is 10 times the primary coil in a transformer. If the transformer is connected to 230V main line. How much secondary voltage is obtained? What type of transformer is this? Write use of such transformer.

Given:

Number of primary turns (N_p) = N_p

Number of secondary turns(N_s) = $10N_p$

Primary voltage(V_p) = 230 V

Secondary Voltage (V_s) = ?

$$V_s/v_p = N_s/N_p$$

$$V_s/230 = 10$$

$$V_s = 2300V$$

✓ **Secondary voltage = 2300 V**

Secondary voltage is **higher than primary voltage** → This is a **step-up transformer**.

Use of such transformer:

Used to transmit electricity over long distances in power lines.