Set 1

Which of the following is not the means of telecommunication?
a. Television b. Wall clock c.Mobile phone d.Internet

Correct answer: b. Wall clock

Reason:
Telecommunication means sending information over a distance using electronic devices.

Television, mobile phone, and internet transmit information.

A **wall clock** only shows time; it does not transmit information.

Which of the following is the result of weak firewall?
a. Stealing cash by hacking an ATM
b. Stealing data by hacking website.
c. Both a and b
d. None of these

Correct answer: c. Both a and b

Reason:
A weak firewall allows hackers to enter computer systems. This can result in:

Hacking ATMs and stealing cash

Hacking websites and stealing data
So **both problems can occur**.

Which of the following statements are correct in relation to “Action and reaction”?
i. Can cancel each other.
ii. Do not cancel each other.
iii. Both act on the same object.
iv. Act on two different bodies.

A. i and ii b. i and ii c.ii and iv d.iii and iv

Correct answer: c. ii and iv

✔ ii. Do not cancel each other
✔ iv. Act on two different bodies

Reason:
According to **Newton's Third Law**:

Action and reaction forces are **equal and opposite**

They act on **different bodies**, so they **do not cancel each other**

Which of the following groups is not the renewable source of energy?
A. Coal and diesel b. Wind turbine and biogas
B. Briquette and LP gas d. Biogas and petrol

Correct answer: A. Coal and diesel

Reason: Coal and diesel are **fossil fuels**

They take millions of years to form and **cannot be renewed quickly**
Hence, they are **non-renewable**.

Which of the given elements are used to obtain nuclear energy?
A..Nitrogen and hydrogen
B.oxygen and uranium
C.Uranium and plutonium
D. Mercury and uranium.

Correct answer: C. Uranium and plutonium

Reason:

Nuclear energy is produced by **nuclear fission**

Uranium and plutonium are commonly used nuclear fuels
Other elements listed are not suitable for nuclear power generation.

Group b
Write very short answers to the following questions.

1. Write 1 part out of 100 parts of 1 second in scientific notation.

Answer:

$1/100s = 0.01 = 1 \times 10^{-2}$

2. Mention any one advantage from the study of evolution.

It helps us understand the **origin and development of living organisms**.

3. What is downlink signal?

A **downlink signal** is a signal sent **from a satellite to the Earth station**.

4. Mention any two types of briquettes and write one difference between them.

The two types of briquettes are: Biomass briquette and Coal briquette.

One difference:
Biomass briquette is **renewable**, while coal briquette is **non-renewable**.

Group c

Write short answers to the following questions.

1. Identify coefficient, mantissa, base and indices from the following number.
   4.62×10^{-13}

Answer: For the given number 4.62×10^{-13}

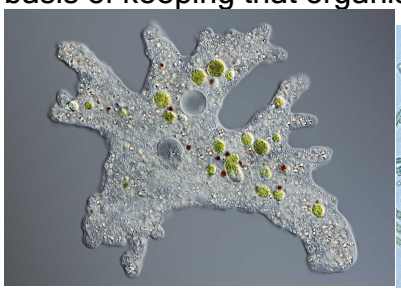
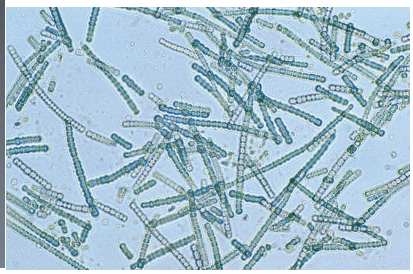
Coefficient: 4.62

Mantissa: 4.62

Base: 10

Index (Exponent): -13

2. Identify given organisms and write their kingdom. Also, write down the basis of keeping that organism in that kingdom.

a. Amoeba B. blue green algae

(i) Amoeba

Kingdom: Protista

Basis:

It is **unicellular**

It is a **eukaryotic organism** (true nucleus present)

(ii) Blue-green algae (Cyanobacteria)

Kingdom: Monera

Basis:

It is **prokaryotic** (no true nucleus)

It is **unicellular/simple multicellular** and lacks membrane-bound organelles.

3. How is mushroom stored? Write any two methods?

Mushroom is stored by the following methods:

Drying – Water is removed to prevent spoilage.

Canning – Mushrooms are sealed in airtight containers.

4. Mention any two criticism's of darwin theory.

Any two criticisms of Darwin's theory of evolution are:

It **cannot explain the origin of variations**.

It **does not explain sudden (mutational) changes** or new species appearing abruptly.

5. Write down the types of pulley shown in the given figures and also write down their velocity ratio of each.

A. Single fixed pulley
B. Single movable pulley

A: VR = 1
B: VR = 2

6. Draw a neat and labelled figure showing the working mechanisms of a hydroelectric project.

(use book)

7.Convert one light year into meter.

Answer: Light year is the distance travelled by light in one year.
1 year = 365 days
= 365 x 24 hours
= 365 x 24 x 60 minutes
= 365 x 24 x 60 x 60 seconds
= 31,536,000 seconds
The speed of light in one second is 3×10^8m/s.
So, $31536000 \times 3 \times 10^8$m/s = 9.5×10^{15}m.

7. Formula equation is more meaningful than a word equation.why?
Answer:
Because a **formula equation shows exact quantities and ratios** of reactants and products, while a word equation shows only their names.

Group D

Write short notes on:

A. NepaliSat-1

NepaliSat-1 is the **first satellite of Nepal**, launched in **2019** under the **BIRDS-3 project**.
It is a **CubeSat** developed by Nepali engineers and is used to **capture images of Nepal and study environmental changes**.

B. GPS technology

GPS (Global Positioning System) is a **satellite-based navigation system**.
It helps to **determine the exact location, time, and speed** of an object anywhere on Earth using signals from satellites.

What is the relationship among initial velocity, distance covered, acceleration produced and final velocity of a moving body?write. A truck is moving with the velocity of 72km/hr. When the driver applies brakes, the truck is stopped in 2 seconds, then calculate the distance covered and retardation of the truck. If the mass is 5000kg, calculate the force applied by the brakes to stop the truck.

Relationship among initial velocity, distance, acceleration, and final velocity

$V^2 = u^2 + 2as$
Where v is final velocity, u is initial velocity, a is acceleration and s is distance covered.

Numerical problem

Given:
initial velocity (u) = 72km/h = 20m/s

Final velocity (v) = 0m/s(truck stops)

Time taken to stop(t) = 2s

Mass (m) = 5000kg

(i) Retardation

a = (v-u)/t = (0-20)/2 = -10m/s^2

Retardation = $10m/s^2$

(ii) Distance covered

$s = ut + 1/2at^2$
$S = (20 \times 2) + 1/2 \times -10 \times (2)^2$
$S = 20m$

(iii) Force applied by brakes

$F=ma=5000\times(-10)=-50,000N$

Answer the following questions on the basis of given figures.

A: atomic no = 8
B: atomic no = 11
C:atomic no = 17

i. What are the valencies of A and B? Why?

Element A (Atomic number 8 → Oxygen)

Electronic configuration: **2, 6**

Valence electrons = 6

It needs **2 electrons** to complete its octet

✓ **Valency of A = 2**

Element B (Atomic number 11 → Sodium)

Electronic configuration: **2, 8, 1**

Valence electrons = 1

It loses **1 electron** to attain stable configuration

✓ **Valency of B = 1**

ii. Name the compound formed by the combination of the elements B and C. Also write down the type of bond with reason.

Element B → Sodium (Na)

Element C → Chlorine (Cl)

$Na + Cl_2 = NaCl$

Compound formed: Sodium chloride (NaCl)

Type of bond: electrovalent bond

Reason:

Sodium (B) **loses one electron**

Chlorine (C) **gains one electron**

The transfer of electrons forms an electrovalent **bond.**