Section A
(Multiple Choice Questions)
Choose the best alternative to the following questions and write in the answer sheet

1.
a. Which one of the following is a derived unit?
i. Candela ii.Ampere iii.Newton iv.Mole

Correct answer: ✔ iii. Newton

Explanation:

Candela, ampere, and mole are **SI base units**, not derived.

b.what is the reason of keeping sea-urchin in phylum echinodermata?
i.Due to body being divided into head, thorax and abdomen.
ii. Due to locomotion with the help of the tube feet.
iii.Due to body being flat and thin like a tape.
iv.Due to being found in moist soil and water.

Correct answer: ✔ ii. Due to locomotion with the help of tube feet

Explanation:
Sea-urchins move using **tube feet**, which are part of the **water vascular system**—a defining feature of echinoderms.
Other options describe insects, flatworms, or anneli

c. In the given organism, What is the relationship between caterpillar and fungi?
i.Saprotropic ii.parasitic iii.predator iv.symbiotic

Correct answer: ✔ ii. Parasitic

Explanation:
Some fungi grow on or inside caterpillars and obtain food from them, **harming the caterpillar.**
Since one organism benefits and the other is harmed, the relationship is **parasitism.**

d. What could be weight of a body on the Earth if its weight on the Moon is 5N?
i.5/6 N ii. 5N iii. 30N iv.50 N

Correct answer: ✔ iii. 30 N

Explanation:
Gravity on the Moon is **1/6th** of Earth's gravity.

Weight on Earth = 5 x 6 = 30N

e. Under what condition can a flat universe be hypothesized?
i. when the average density is greater than the critical density.
ii.when the average density is less than critical density.
iii.when the average density and critical density are equal.
iv. When the average density and critical density are not comparable.

Correct answer: ✔ iii. When the average density and critical density are equal

Explanation:
In cosmology:

Average density > critical density → closed universe

Average density < critical density → open universe
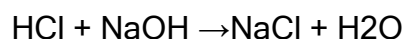
Average density = critical density → flat universe

f. What are the products obtained in a relation between hydrochloric acid and sodium hydroxide?
i.NaNO3+ H2 ii. NaCl + H2O iii.NaN03 + H2O iv.NaNO3 + O2

Correct answer: ✔ ii. NaCl + H₂O

Explanation:
This is a **neutralization reaction**:

HCl + NaOH →NaCl + H2O

An acid reacts with a base to form **salt and water**.

g. What does carbogen indicate?

i.Mixture of carbon dioxide and nitrogen
ii.Mixture of carbon dioxide and hydrogen
iii.Mixture of carbon dioxide and water
Iv.Mixture of carbon dioxide and oxygen

Correct answer: ✔ iv. Mixture of carbon dioxide and oxygen

Explanation:
Carbogen is a medical gas mixture containing:

95% oxygen

5% carbon dioxide

It is used to stimulate breathing in patients.

Group B
What is online reputation?
Online reputation is the image or impression of a person or organization formed through information available on the internet.

On the basis of their features, which one is less developed animal?
A: Whale   B: Shark
 Shark
(Shark is a fish, while whale is a mammal and more advanced.)
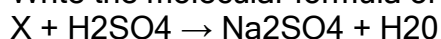
What is magnetic field?
Magnetic field is the region around a magnet or current-carrying conductor where magnetic force is experienced.

Why is big bang theory considered the most reliable theory among all the theories related to the origin of universe?
It is because it is supported by strong evidence such as **expansion of the universe** and **cosmic microwave background radiation**
Give an example of combination reaction.

Write the molecular formula of the compounds 'x' in the given chemical equation.
X + H2SO4 → Na2SO4 + H20
X = NaOH or Na2O
Write the molecular formula of the acid formed when carbon dioxide gas dissolved in water.
H_2CO_3 (Carbonic acid)

Group C
Define fundamental unit and give one example.
A **fundamental unit** is a basic unit that cannot be derived from any other unit.
Example: metre (m)

Fern is not a flowering plant; cycas bears flowers but not fruit; banana bears flowers as well as fruit. However, all these plants are kept in same division. Give any two reasons, why they are all kept in the same division.

Fern, Cycas and Banana are kept in the same division (Tracheophyta) because:

All possess well-developed vascular tissues (xylem and phloem) for conduction of water and food.

All have true roots, stems and leaves.

Write any two difference between drone bee and worker bee

Drone Bee	Worker Bee
is male bee	is sterile female bee
oes not collect food.	ollects nectar and pollen.

.
Write the name of plant which is used in the treatment of burn. Write one other use of this plant.
Plant: Aloe vera
Other use: Used in making cosmetics.
If the weight of a cricket ball in water is 2N and the weight of the water displaced by it is 1N,

i. What is the actual weight of the cricket ball.
Actual weight=Apparent weight+Weight of displaced water =2N+1N=3N

ii. On which principle is the experiment based?
Archimedes' principle.

Water pipe bursts in very cold places in winter. Write any two reasons for this.
The two reasons for water pipe burts in very cold places in winter are given as:

· Water **expands on freezing** (anomalous expansion).

· The expansion creates **high pressure** inside the pipe causing it to burst.

If the substance of mass 500g needs 5980J of heat to increase its temperature from 100°C to 226°C, Calculate its specific heat capacity.

Given:
Massof substance(m)=500g=0.5kg
Heat supplied (Q)=5980J

Specific heat capacity of substance(S) = ?
Change in temperature,
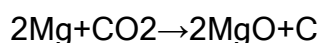
dt=226−100=126°C

We know,

Q = mSdt

S = Q/mdt

S = 5980J / (0.5 x 126)
S = 94.92 J /Kg°C

Therefore, Specific heat of given substance is 94.92 J /Kg°C.

A student inserted a burning matchstick into a gas jar and it extinguishes. Write the balanced chemical equation of a reaction that takes place when burning magnesium ribbon is inserted into the gas jar.

(The gas is **carbon dioxide**.)

Balanced chemical equation:

2Mg+CO2→2MgO+C

Group D
Write any two positive and negative impacts of digital technology.
Answer: The two positive and negative impacts of digital technology are given as:

Positive impacts of digital technology:

Fast communication and easy access to information
Digital technology enables instant communication (email, messaging, video calls) and quick access to information through the internet.

Improvement in education and work efficiency
Online classes, digital tools, and automation increase learning opportunities and make work faster and more accurate.

Negative impacts of digital technology:

Cybercrime and privacy issues
Digital technology increases risks such as hacking, online fraud, and misuse of personal data.

Health and social problems
Excessive use of digital devices can cause eye strain, addiction, lack of physical activity, and reduced face-to-face interaction.

State Newton's Universal law of gravitation and prove that $F = Gm_1m_2/d^2$ with the help of appropriate diagram.

(Answer from Book from force and motion)

Study the given figure.
Figure A: Electric power station transmitting power without transformers.
Figure B: Electric power station transmitting power with transformers.

i. Name the transformers X and Y.

Transformer X: Step-up transformer

Transformer Y: Step-down transformer

ii. Write any two problems of transmitting electricity the way shown in figure A.

· **Problem due to absence of step-up transformer (at the power station):**

Voltage is not increased before transmission. This causes **high current in the transmission lines**, leading to **large power loss.**

● **Problem due to absence of step-down transformer (near consumers):**

Voltage remains very high. This is **unsafe for household use** and can **damage electrical appliances**.

i.   State the modern periodic law.
Modern periodic law states that the properties of elements are a periodic function of their **atomic numbers.**

ii.   A = 1s2, 2s2 2p6, 3s2
     B = 1s2, 2s2 2p4

a. In which group of the periodic table does the element B lie?
Group 16
b. Write the balanced chemical equation obtained in the reaction between A and B.
A = Magnesium
B = Oxygen

Reaction: Magnesium reacts with oxygen to form magnesium oxide:

$2Mg + O_2 \rightarrow 2MgO$