Set 3:
Multiple choice questions:

1. In which orbit should the artificial satellite be launched such that it revolves relatively above the space of equatorial line?
a. Low Earth Orbit
b. Geosynchronous orbit
c. Geostationary orbit
d. Medium Earth Orbit

Correct answer:
✓ **c. Geostationary orbit**

Explanation:
A satellite in a **geostationary orbit** revolves **above the equator** and appears **stationary relative to the Earth**.

2. What is called process of naming living beings into groups and sub groups on the basis of their characteristics?
a. Nomenclature
b. Classification
c. Grouping
d. Sub-Grouping

✓ **b. Classification**

Explanation:
Classification is the process of **grouping living organisms into groups and sub-groups** according to their similarities and differences.

3. Why is basidium present in gills called fertile cells?
a. It can produce spores.
b. Its size is small.
c. It can reproduce.
d. Its shape is elongated.

Correct answer:
✓ **a. It can produce spores.**

Explanation:
Basidium is called a **fertile cell** because it **produces spores** for reproduction.

4. Which of the following is not the principle of mutation?
a. Mutation is the basis of evolution.
b. All characteristics developed from variation are recessive.
c. New species is involved if there were more variation.
d. Mutation can transmit into next generation.

Correct answer:
✓ **b. All characteristics developed from variation are recessive.**

Explanation:
Variations can be **dominant or recessive**, not always recessive. Hence this statement is incorrect.

5. If mass of a body increases, the inertia .....
a. Increases
b. Decreases
c. Remains the same
d. Decrease as well as increases

Correct answer:
✓ **a. Increases**

Explanation:
Inertia depends on **mass**. Greater the mass, **greater is the inertia**.

6. Which of the following is the non-renewable source of energy?
a. Biomass energy
b. Wind energy
c. Solar energy
d. Fossil fuel energy

Correct answer:
✓ **d. Fossil fuel energy**

Explanation:
Fossil fuels take **millions of years to form** and cannot be regenerated easily, so they are **non-renewable**.

Group B

1. What is scientific process skill?
Answer: The ability to observe, measure, classify, infer, predict, and experiment in order to investigate and understand natural phenomena.

2. What is bio energy?
Answer: Energy obtained from biological sources like plants, animals, or their waste (e.g., biogas, biomass).

3. Write one difference between white dwarf and black dwarf:
Answer: A **white dwarf** is a hot, dense star that has exhausted its fuel, while a **black dwarf** is a white dwarf that has cooled down and no longer emits significant heat or light.

Group c

1. Write any two achievements of biology in two sentences.

The two achievements of biology are given as:

Biology has helped in **curing diseases** through the development of vaccines and medicines.

It has also contributed to **improving agriculture** by producing high-yield and disease-resistant crops.

2. Define Uplink signal and Downlink signal.

Uplink signal: The signal sent from **Earth to a satellite**.

Downlink signal: The signal sent from a **satellite back to Earth**.

3. Five kingdom system of classification is more appropriate and scientific than two kingdom system. Give two reasons.

The two reasons Five kingdom system of classification is more appropriate and scientific than two kingdom system are given as:

It separates **prokaryotes (Monera) from eukaryotes**, which the two-kingdom system did not.

It recognizes **major differences in nutrition, cell structure, and reproduction** among organisms, making classification more accurate.

4. Lamarck's theory is not accepted universally. Give any two reasons.

The two reasons that Lamarck's theory is not accepted universally are:

Acquired characteristics **cannot be inherited**, which contradicts Lamarck's idea.

Evolution occurs due to **natural selection, not just use or disuse of organs**.

5. Write any two differences between ideal machine and practical machine.

Ideal Machine	Practical Machine
Has **no friction**, so efficiency = 100%.	Has **friction**, so efficiency < 100%.
Output work = Input work	Output work < Input work due to losses

6. Write down suitable conditions required for thermonuclear fusion reaction in the Sun.

Very high temperature (millions of °C) to overcome repulsion between nuclei.

High pressure/density to bring nuclei close enough for fusion.

7. Name any four elements having variable valency. Also, write their valencies.

Element	Valencies
Iron (Fe)	2, 3
Copper (Cu)	1, 2
Tin (Sn)	2, 4

Element	Valencies
Lead (Pb)	2, 4

Group D

1. Write any three practical applications of newton's third law of motion. Write one utility of unbalanced force.

Newton's Third Law: *"For every action, there is an equal and opposite reaction."*

Three practical applications:

Walking: When we push the ground backward with our feet, the ground pushes us forward.

Rocket propulsion: Expelled gases push the rocket forward with equal and opposite force.

Swimming: Hands push water backward, water pushes the swimmer forward.

Utility of unbalanced force:

An **unbalanced force** changes the **speed or direction** of a moving object.
Example: Brakes slow down a moving car because the unbalanced force acts opposite to motion.

2. Introduce atom and describe structure of sodium atom with a neat figure.

Introduction:

An **atom** is the **smallest particle of an element** that can exist independently and retain the properties of the element.

Structure of Sodium atom (Na, Atomic number = 11):

Protons (p^+): 11 in nucleus

Neutrons (n^0): 12 in nucleus (Mass number = 23, 23 − 11 = 12)

Electrons (e^-): 11, arranged in shells as 2, 8, 1

(make atom diagram)

3. Write any two differences of each.

a) Word Equation vs Formula Equation

Word Equation	Formula Equation
Represents reactants and products in **words**	Represents reactants and products in **chemical symbols/formulas**
Example: Hydrogen + Oxygen → Water	Example: $2H_2 + O_2 \rightarrow 2H_2O$

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b) Exothermic Reaction vs Endothermic Reaction

Exothermic Reaction	Endothermic Reaction
Releases heat to surroundings	**Absorbs heat** from surroundings
Temperature of surroundings **increases**	Temperature of surroundings **decreases**