POST-MID TERM EXAMINATION 2025-26
SCIENCE
MARKING SCHEME (086)

Class: IX **Time: 1hour**
Date: 12.01.26 **Max Marks: 25**

Section A

1. (b) Higher Kinetic Energy 1

2. (b) the sum of the number of protons and neutrons 1

3. (b) Both assertion and reason are true, but reason is not the correct explanation of assertion 1

Section B

4. Positive work occurs when the displacement of an object is in the same direction as the applied force. In contrast, negative work happens when the displacement is in the opposite direction to the force. 2

When lifting an object, two forces act on it:

Force due to gravity (F = mg): This force acts downwards.

Applied force (F): This force acts upwards.

In this scenario: (a) The applied force does positive work because it moves the object upwards.

(b) The force of gravity does negative work as it acts in the opposite direction to the displacement.

5. Kinetic energy of an object is the energy possessed by it by virtue of its state of motion. Every moving object possesses kinetic energy. 2

Consider an object of mass m in a state of motion with an initial velocity u.

Let a constant force F act on it and displace the body through a distance s in the direction of the force applied.

∴ Work was done on the object W = Fs

Due to the work done on the body, let the velocity of the object change from u to v and a be the acceleration produced.

Then, according to the equation of motion $v^2 - u^2 = 2as$

$$s = \frac{v^2 - u^2}{2a}$$

⇒ Again, according to the second law of motion, we have F = ma

∴ Work was done on the object

W = Fs = (ma) $\left(\frac{v^2-u^2}{2a}\right) = \frac{1}{2}m(v^2-u^2)$

If the object started from rest, then u = 0 and hence W = $\frac{1}{2}mv^2$

The work done on the object is equal to the kinetic energy imparted to the object. Thus, the kinetic energy possessed by an object of mass m moving with a uniform velocity v is given by

$$E_k = \frac{1}{2}mv^2$$

6. Answer: K shell can hold 2 electrons and L shell can hold 8 electrons. When both the shells are full, there will be (8 + 2), 10 electrons in the atom. 2

7. Protons → Positively charged 2
Electrons → Negatively charged
Neutrons → No charge

(b) Neutron =20, Proton=19

8. **Hybridisation:** 2
Hybridisation is the process of crossing two plants or animals with different desirable traits to produce a new variety that has the best features of both parents.
Photoperiod:
Photoperiod is the length of day and night in a 24-hour period. It affects the growth and flowering of plants.

Section C

9. To calculate the total work done by the labourer, we consider: 3

Mass of labourer: 50 kg

Mass of load: 60 kg

Height of building: 15 m

∴ Total force applied by labourer F = (m1 + m2)g

Work done W = Fs = (m1 + m2)gh = (50 + 60) x 10 x 15 = 16500 J

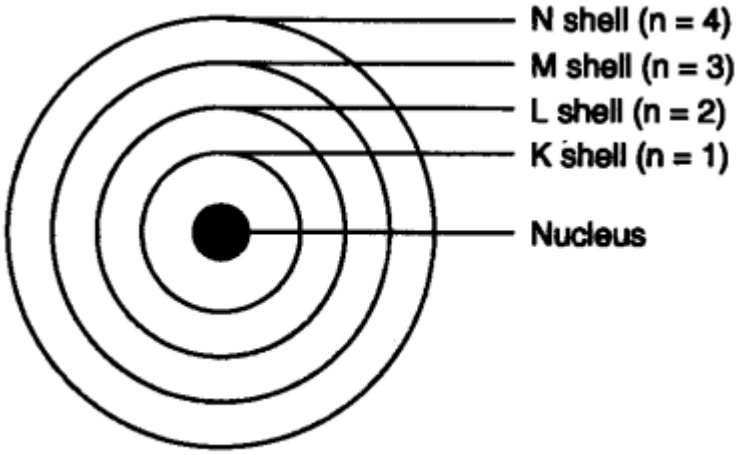
When the labourer carries an additional load of mass m3 = 10 kg,

the total force F' = (m1 + m2 + m3)g

Total work done W' - F's = (m1 + m2 + m3)gh = (50 + 60 + 10) x 10 x 15 = 18000 J

10. Bohr's model of the atom 3
(1) Atom has nucleus in the centre.
(2) Electrons revolve around the nucleus.
(3) Certain special orbits known as discrete orbits of electrons are allowed inside the

atom.
(4) While revolving in discrete orbits the electrons do not radiate energy.
(5) These orbits or shells are called energy levels.
(6) These orbits or shells are represented by the letters K, L, M, N or the numbers n = 1, 2, 3, 4



Bohr's model

11. When plants do not get enough nutrients from the soil, they show several deficiency symptoms. These include: 3
1. Poor growth: The plant becomes weak, stunted, and does not grow properly.
2. Discolouration of leaves: Leaves may turn yellow, pale, or develop brown spots due to lack of essential nutrients like nitrogen, potassium, or magnesium.
3. Low yield: The plant produces fewer flowers, fruits, and seeds, reducing the overall crop production.
These symptoms occur because nutrients are essential for healthy plant functions like photosynthesis, formation of proteins, and overall development.

12. **(a) Kharif and Rabi crops** 3
Kharif crops: Sown in the rainy season (June–July) and harvested in September–October.
Rabi crops: Sown in the winter season (October–November) and harvested in March–April.
b. Manure and Fertilizer
Manure: Natural substance made from the decomposition of plant and animal waste; improves soil fertility.
Fertilizer: Chemical or industrially prepared substance rich in nutrients; provides specific nutrients quickly to plants.
c. Macronutrient and Micronutrient
Macronutrient: Nutrients needed by plants in large amounts (e.g., nitrogen, phosphorus, potassium).
Micronutrient: Nutrients required by plants in very small amounts (e.g., iron, zinc, manganese).

_____End of the MS_____