

TS EAMCET 2025 April 29 Shift 2 Question Paper With Solution

Time Allowed :3 Hours	Maximum Marks : 160	Total Questions :160
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General Instructions

Read the following instructions very carefully and strictly follow them:

1. This question paper comprises 160 questions.
2. The Paper is divided into three parts- Biology, Physics and Chemistry.
3. There are 40 questions in Physics, 40 questions in Chemistry and 80 questions in Biology.
4. For each correct response, candidates are awarded 1 marks.

1. Which of the following statements are correct with respect to the inflorescence in Cotoneaster?

- (1) The peduncle shows an indefinite growth.
- (2) The peduncle shows a definite growth.
- (3) The flowers are borne in an acropetal manner on peduncle.
- (4) The flowers are borne in basipetal manner on peduncle.

Correct Answer: (1) and (3)

Solution: - The peduncle shows an indefinite growth: This is correct. In Cotoneaster, the peduncle exhibits indefinite growth, meaning it does not stop growing as it continues to produce flowers.

- The peduncle shows a definite growth: This is incorrect. The peduncle in Cotoneaster does not show a definite or limited growth, which is typically seen in other types of plants with definite growth patterns.

- The flowers are borne in an acropetal manner on peduncle: This is correct. In Cotoneaster, flowers develop in an acropetal manner, meaning that the younger flowers are borne towards the tip of the inflorescence, with older flowers towards the base.

- The flowers are borne in a basipetal manner on peduncle: This is incorrect. A basipetal pattern means that the younger flowers are borne at the base, which does not occur in Cotoneaster.

Thus, the correct statements are (1) The peduncle shows an indefinite growth and (3) The flowers are borne in an acropetal manner on peduncle.

Quick Tip

In Cotoneaster, the peduncle grows indefinitely, and flowers are borne acropetally on the peduncle, with younger flowers appearing at the tip.

2. Which of the following forces have infinite range?

- (1) Gravitational force
- (2) Weak nuclear force

- (3) Electromagnetic force
- (4) Strong nuclear force

Correct Answer: (1) Gravitational force

Solution: - Gravitational force: This is the correct answer. Gravitational force has an infinite range. It acts between any two masses and decreases with the square of the distance between them, but it never completely disappears. It has an infinite range because there is no distance at which it becomes zero.

- Weak nuclear force: The weak nuclear force has a very short range (approximately 10^{-18} meters). It is responsible for processes like beta decay and does not have an infinite range.

- Electromagnetic force: The electromagnetic force has an infinite range in theory, but its strength depends on the medium. In vacuum, it is long-range, but in practical scenarios, its effect can be shielded or diminished by the environment. Still, it is generally considered to have a range extending indefinitely.

- Strong nuclear force: The strong nuclear force has a very short range, typically acting only over distances of the order of a nucleus (around 10^{-15} meters). It is responsible for holding protons and neutrons together in the nucleus.

Thus, the correct answer is Gravitational force (1), as it is the force with infinite range.

Quick Tip

Among the fundamental forces, only gravitational force is known to have an infinite range, although its effect weakens with distance.

3. ICBN refers to?

- (1) International Code of Botanical Nomenclature
- (2) International Committee of Biotech Nomenclature
- (3) International Code of Business Nomenclature
- (4) International Convention of Botanical Naming

Correct Answer: (1) International Code of Botanical Nomenclature

Solution: - International Code of Botanical Nomenclature (ICBN): This is the correct answer. ICBN is the set of rules and recommendations used for naming plants, algae, and fungi. It ensures the use of standardized scientific names and classifications in botanical research.

- International Committee of Biotech Nomenclature: This is not the correct term. There is no specific nomenclature committee for biotechnology referred to by this acronym.

- International Code of Business Nomenclature: This is incorrect. There is no widely known nomenclature code in business specifically called ICBN.

- International Convention of Botanical Naming: This is an incorrect term. The correct term is International Code of Botanical Nomenclature.

Thus, the correct answer is International Code of Botanical Nomenclature (1).

Quick Tip

ICBN is a crucial system for naming plants and fungi. It helps in avoiding confusion by providing each species with a unique scientific name.

4. A ball is projected vertically up with speed V_0 from a certain height H . When the ball reaches the ground the speed is $3V_0$. The time taken by the ball to reach the ground and height H respectively are (g = acceleration due to gravity)

Solution: We are given that the ball is projected vertically upward with speed V_0 from a height H , and when it reaches the ground, its speed is $3V_0$. We need to find the time taken to reach the ground and the value of height H .

Using the equations of motion:

1. $v^2 = u^2 + 2gh$, where:

- $v = 3V_0$ (final velocity)

- $u = V_0$ (initial velocity)

- $h = H$ (height traveled)

So, $(3V_0)^2 = (V_0)^2 + 2gH$, which simplifies to:

$$9V_0^2 = V_0^2 + 2gH$$

$$8V_0^2 = 2gH$$

$$H = \frac{4V_0^2}{g}$$

2. To find the time t , we use the formula:

$$v = u + gt$$

$$3V_0 = V_0 + gt$$

Solving for t , we get:

$$2V_0 = gt$$

$$t = \frac{2V_0}{g}$$

Quick Tip

For vertical motion, remember that the final velocity of an object thrown upwards will be greater than its initial velocity when falling back down, due to the acceleration due to gravity.

5. How many among the given species have the highest bond order? CN^- , CO , NO^- , O_2 , N_2

(1) 1

(2) 2

(3) 3

(4) 4

Correct Answer: (3) 3

Solution: To calculate bond order, we use the formula:

$$\text{Bond Order} = \frac{(\text{Number of bonding electrons}) - (\text{Number of anti-bonding electrons})}{2}$$

We calculate the bond order for each species based on their molecular orbital (MO) diagram.

1. CN^- :

The molecular orbital configuration for CN^- (an extra electron) is:

$$1\sigma_g^2, 1\sigma_u^2, 2\sigma_g^2, 2\sigma_u^2, 1\pi_u^4, 1\pi_g^2$$

The number of bonding electrons = 8, anti-bonding electrons = 4, so:

$$\text{Bond Order} = \frac{8 - 4}{2} = 2$$

2. CO: The molecular orbital configuration for CO is:

$$1\sigma_g^2, 1\sigma_u^2, 2\sigma_g^2, 2\sigma_u^2, 1\pi_u^4, 1\pi_g^2$$

The number of bonding electrons = 10, anti-bonding electrons = 4, so:

$$\text{Bond Order} = \frac{10 - 4}{2} = 3$$

3. NO^- :

The molecular orbital configuration for NO^- (an extra electron) is:

$$1\sigma_g^2, 1\sigma_u^2, 2\sigma_g^2, 2\sigma_u^2, 1\pi_u^4, 1\pi_g^3$$

The number of bonding electrons = 9, anti-bonding electrons = 5, so:

$$\text{Bond Order} = \frac{9 - 5}{2} = 2$$

4. O_2 : The molecular orbital configuration for O_2 is:

$$1\sigma_g^2, 1\sigma_u^2, 2\sigma_g^2, 2\sigma_u^2, 1\pi_u^4, 1\pi_g^2$$

The number of bonding electrons = 10, anti-bonding electrons = 6, so:

$$\text{Bond Order} = \frac{10 - 6}{2} = 2$$

5. N_2 :

The molecular orbital configuration for N_2 is:

$$1\sigma_g^2, 1\sigma_u^2, 2\sigma_g^2, 2\sigma_u^2, 1\pi_u^4, 1\pi_g^2$$

The number of bonding electrons = 10, anti-bonding electrons = 4, so:

$$\text{Bond Order} = \frac{10 - 4}{2} = 3$$

Thus, CO and N₂ have the highest bond order of 3.

Therefore, the correct answer is (3) 3.

Quick Tip

Remember, bond order is calculated by the number of bonding electrons minus anti-bonding electrons, divided by 2. The species with the highest bond order typically have more bonding electrons and fewer anti-bonding electrons.
