

**JEE-Main-30-01-2024 (Memory Based)**  
**[MORNING SHIFT]**

**Chemistry**

**Question: Statement I:**  $\text{CH}_2 = \text{CH}_2 - \text{CH}_2 - \text{Cl}$  is an allyl halide

**Statement II:** Allyl halides have halogen attached to  $\text{sp}^2$  carbon

**Options:**

- (a) Both statement I and statement II are false
- (b) Statement I is true but statement II is false
- (c) Statement I is false but statement II is true
- (d) Both statement I and statement II are true

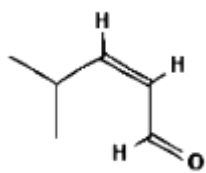
**Answer: (b)**

**Solution:** Statement I correct and II and is wrong

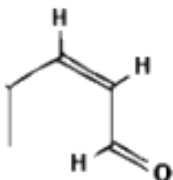
**Question:** Find the correct structure of 4-methylpent-2-enal

**Options:**

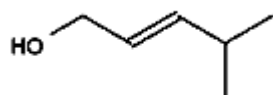
(a)



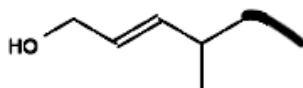
(b)



(c)

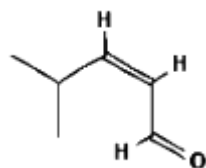


(d)



**Answer: (a)**

**Solution:**



**Question:** Which of the following lanthanides ions are diamagnetic?

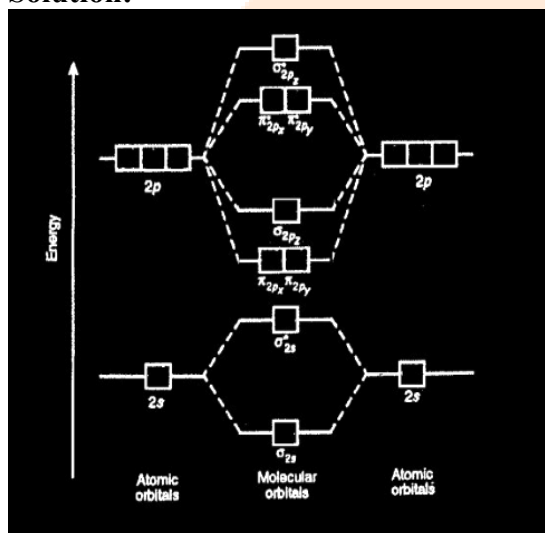
**Options:**

- (a)  $\text{Ce}^{+4}$  &  $\text{La}^{+3}$
- (b)  $\text{Ce}^{+4}$  &  $\text{Sm}^{+2}$
- (c)  $\text{Ce}^{+2}$  &  $\text{Yb}^{+4}$
- (d)  $\text{Ce}^{+2}$  &  $\text{Yb}^{+2}$

**Answer:** (a)

**Question:** Find out the maximum number of hybrid orbitals formed when 2s and 2p orbitals are mixed.

**Solution:**



**Question:** IUPAC name Unununium element lies in which group in the periodic table?

**Options:**

- (a) 7th period., 11 group
- (b) 5th group
- (c) 6th Group
- (d) 4th group

**Answer:** (a)

**Solution:**

**Periodic table with atomic number, symbol, and electron configuration**

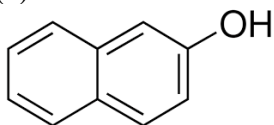
Alkali metals       Halogens  
 Alkaline-earth metals       Noble gases  
 Transition metals       Rare-earth elements (21, 39, 57-71) and lanthanoid elements (57-71 only)  
 Other metals       Other nonmetals       Actinoid elements

|                   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1                 | 2  |    |    |    |    |    |    |    |    |    |    | 13 | 14 | 15 | 16 | 17 | 18 |    |
| 1                 | H  |    |    |    |    |    |    |    |    |    |    |    |    |    |    | He |    |    |
| 2                 | Li | Be |    |    |    |    |    |    |    |    |    |    | B  | C  | N  | O  | F  | Ne |
| 3                 | Na | Mg |    |    |    |    |    |    |    |    |    |    | Al | Si | P  | S  | Cl | Ar |
| 4                 | K  | Ca | Sc | Ti | V  | Cr | Mn | Fe | Co | Ni | Cu | Zn | Ga | Ge | As | Se | Br | Kr |
| 5                 | Rb | Sr | Y  | Zr | Nb | Mo | Tc | Ru | Rh | Pd | Ag | Cd | In | Sn | Sb | Te | I  | Xe |
| 6                 | Cs | Ba | La | Hf | Ta | W  | Re | Os | Ir | Pt | Au | Hg | Tl | Pb | Bi | Po | At | Rn |
| 7                 | Fr | Ra | Ac | Rf | Db | Sg | Bh | Hs | Mt | Ds | Rg | Cn | Nh | Fl | Mc | Lv | Ts | Og |
| lanthanoid series |    | 6  | Ce | Pr | Nd | Pm | Sm | Eu | Gd | Tb | Dy | Ho | Er | Tm | Yb | Lu |    |    |
| actinoid series   |    | 7  | Th | Pa | U  | Np | Pu | Am | Cm | Bk | Cf | Es | Fm | Md | No | Lr |    |    |

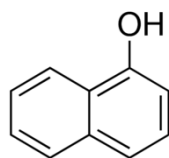
**Question:** Diazonium salt reacts with X compound to give the scarlet red colour. What is X?

**Options:**

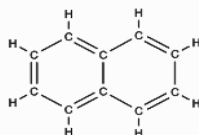
(a)



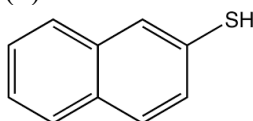
(b)



(c)

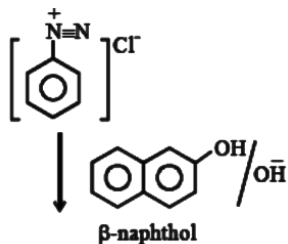


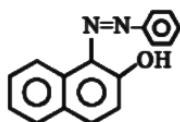
(d)



**Answer: (a)**

**Solution:**





Orange-Red. dye

**Question: Statement I:** Same energy level orbitals are called degenerate orbitals

**Statement II:** In hydrogen the 3p and 3d orbitals are not degenerate orbitals

**Options:**

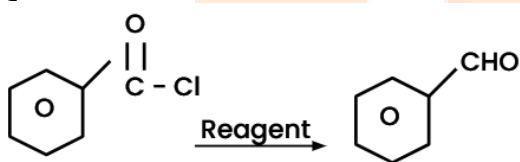
- (a) Both statement I and statement II are false
- (b) Statement I is true but statement II is false
- (c) Statement I is false but statement II is true
- (d) Both statement I and statement II are true

**Answer: (b)**

**Solution:** Statement: 1 is true and

Statement: 2 is false as there are no electrons in the third orbit and thus 3s and 3p and 3d are of equal energy.

**Question:**



**Options:**

- (a)  $\text{H}_2 / \text{Pd} - \text{BaSO}_4$
- (b)  $\text{LiAlH}_4$
- (c)  $\text{NH}_2\text{NH}_2 / \text{KOH} / \text{CH}_2\text{OH} - \text{CH}_2\text{OH}$
- (d)  $\text{Zn} - \text{Hg}/\text{HCl}$

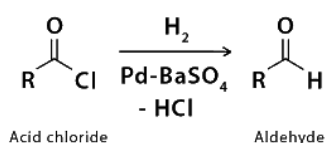
**Answer: (a)**

**Solution:**

$\text{Pd} - \text{BaSO}_4 + \text{H}_2$

lindlar's catalyst its rosenmund reaction.

#### Rosenmund Reduction



**Question:** Which of the following will not give Fehling test

**Options:**

- (a) Acetone
- (b) Propanal
- (c) Ethanal
- (d) Butanal

**Answer: (a)**

**Question: Assertion:** Maltose and lactose are examples of reducing sugars.

**Reason:** Maltose and lactose reducing Fehling's solution and Tollen's reagent

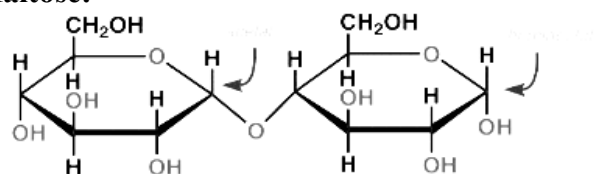
**Options:**

- (a) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion
- (b) Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion
- (c) Assertion is correct but Reason is incorrect
- (d) Both Assertion and Reason are incorrect

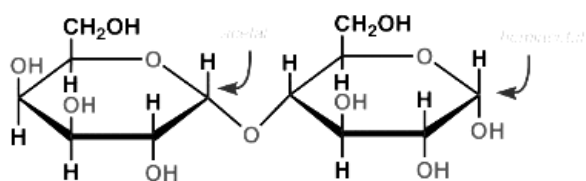
**Answer: (a)**

**Solution:** Lactose and Maltose are also reducing sugars and give a positive Benedict test

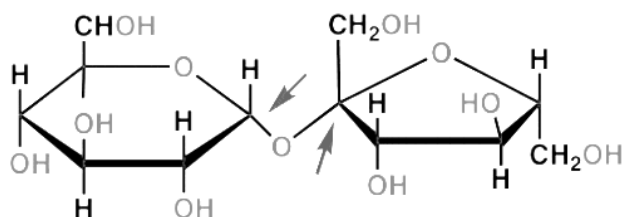
**Maltose:**



**Lactose:**



**Sucrose is a non-reducing sugar**



The structure lacks any hemiacetal functional groups and is therefore “locked” in its cyclic form

**Question:** What is mass of sodium acetate so as to create. A 250 ml of 0.35 M solution. Molar mass was given 82.02 gn

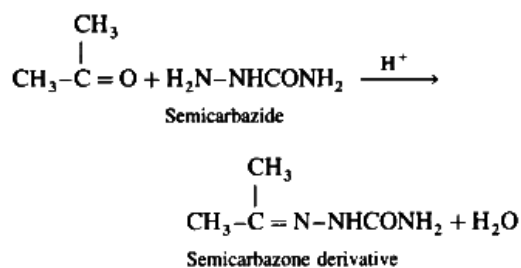
**Solution:**

$$0.35 \times 82 \times 0.25 \Rightarrow \text{Mass} \\ \Rightarrow 7.175$$

**Question:** If ethanol is reacted with semicarbazide. How many nitrogen atom In product

**Solution:**

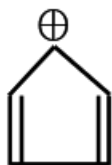
3 Nitrogen in product



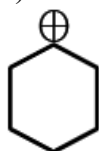
**Question:** Which of the following compound or ion is most stable ?

**Options:**

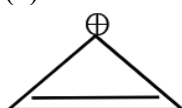
(a)



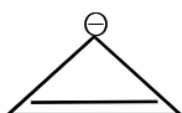
(b)



(c)



(d)



**Answer: (c)**

**Solution:** Due to aromaticity

**Question:** What is the geometry of Aluminium chloride in aqueous solution

**Options:**

(a) Square planar

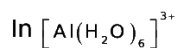
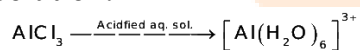
(b) Octahedral

(c) Tetrahedral

(d) Square pyramidal

**Answer: (b)**

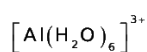
**Solution:**



Oxidation state of  $\text{Al}^{3+} : 1s^2 2s^2 2p^6$

$=[\text{Ne}]$

Hybridisation  $= sp^3d^2$



hybridisation -  $sp^3d^2$

**Question:** Choose the correct option

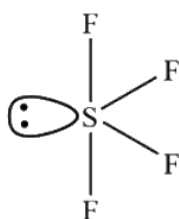
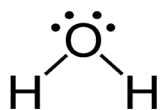
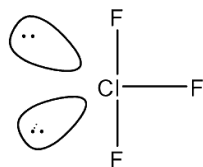
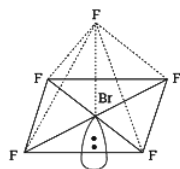
| Molecule                 | Shape               |
|--------------------------|---------------------|
| (a) $\text{BrF}_5$       | (i) Sea-saw         |
| (b) $\text{H}_2\text{O}$ | (ii) T-shape        |
| (c) $\text{ClF}_3$       | (iii) Bent          |
| (d) $\text{SF}_4$        | (iv) Square Pyramid |

**Options:**

- (a) (A) -iv; (B) - iii; (C) - ii; (D) - i  
 (b) (A) -iv; (B) - iii; (C) - i; (D) - ii  
 (c) (A) -iii; (B) - iv; (C) - ii; (D) - i  
 (d) (A) -iii; (B) - iv; (C) - i; (D) - ii

**Answer: (a)**

**Solution:**



See-saw shape

**Question:** What will happen to freezing point if we add naphthalene in benzene

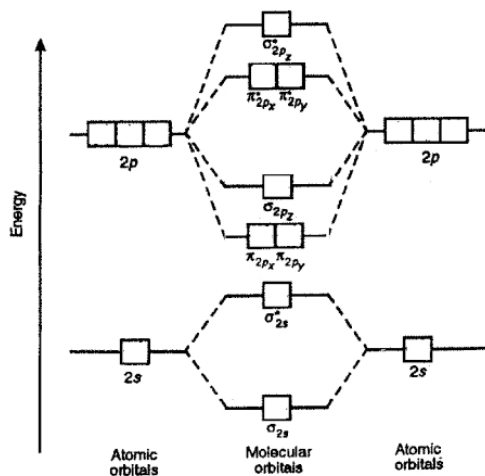
**Options:**

- (a) Increases  
 (b) Decreases  
 (c) First Increases then decreases  
 (d) Remains same

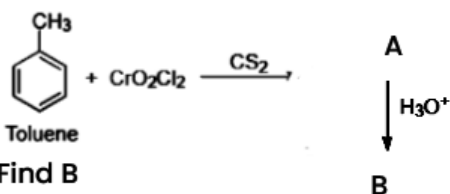
**Answer: (b)**

**Question:** Find out the maximum number of molecular orbitals formed when 2s and 2p orbitals are mixed in diamagnetic molecule

**Solution:**



**Question:**



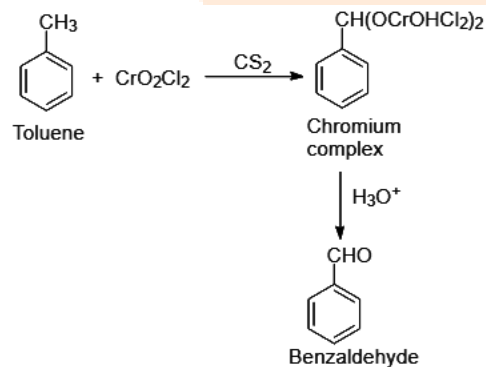
Find B

**Options:**

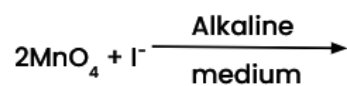
- (a) Acetone
- (b) Propanal
- (c) Benzaldehyde
- (d) Butanal

**Answer: (c)**

**Solution:**



**Question:** Find out sum of the coefficients of all the species involved in the balanced equation :



**Solution:**

