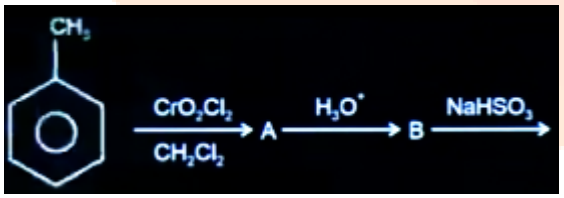
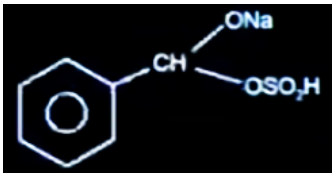
JEE-Main-22-01-2025 (Memory Based)
[EVENING SHIFT]
Chemistry

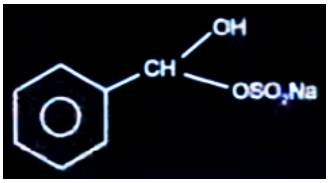
Question: The density of 3M NaOH is 1.25 g/ml. Molality of solutions is
Options:
(a) 2.65
(b) 2.5
(c) 2.8
(d) 3
Answer: (a)
Solution:

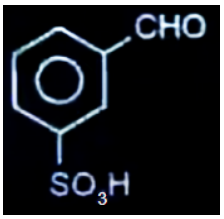
$$m = \frac{1000 \times M}{1000 \times d - M \times Mw}$$

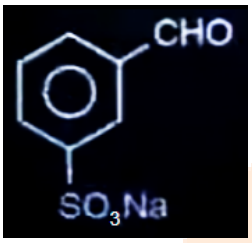
Question: Arrange according to CFSE.
(i) $[Co(NH_3)_4]^{2+}$
(ii) $[Co(NH_3)_6]^{3+}$
(iii) $[Co(NH_3)_6]^{2+}$
(iv) $[Co(en)_3]^{3+}$
Options:
(a) (iv) > (ii) > (iii) > (i)
(b) (iv) > (iii) > (ii) > (i)
(c) (i) > (iii) > (ii) > (iv)
(d) (i) > (ii) > (iii) > (iv)
Answer: (a)
Solution:
CFSE ∝ cation change
∝ strength of ligand

Question: 

Product
The product is
Options:
(a) 

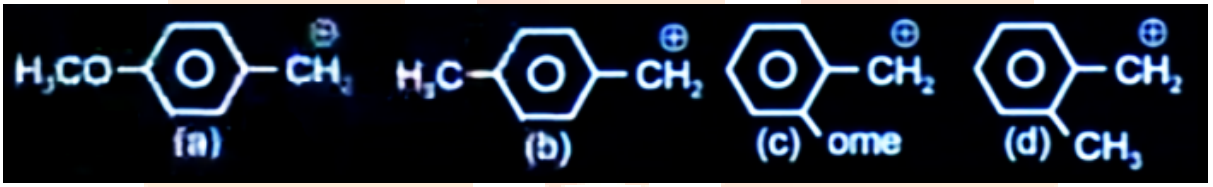
(b) 

(c) 

(d) 

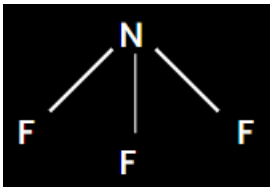
Answer: (b)

Question: What is correct order of stability of carbocation



Options:
(a) a > b > c > d
(b) c > a > d > b
(c) a > c > d > b
(d) c > b > a > d
Answer: (c)

Question: Compare dipole moment of
(i) NF_3
(ii) $CHCl_3$
(iii) H_2S
(iv) HBr
Options:
(a) I > II > III > IV
(b) II > III > I > IV
(c) II > III > IV > I
(d) III > I > IV > II
Answer: (c)



Question: Given below are two statements
S-I: Lassaigne test is used for detection of Nitrogen, phosphorus, sulphur and Halogens.
S-II: Lassaigne extract is made with magnesium metal.
Options:
(a) Both S-I and S-II are correct
(b) Both S-I and S-II are incorrect
(c) S-I is correct but S-II is incorrect
(d) S-I is incorrect but S-II is correct
Answer: (c)

Question: Which one has two secondary Hydrogen atoms?
Options:
(a) 2, 2, 4, 4-tetramethylheptane
(b) 2, 2, 3, 4-tetramethylheptane
(c) 2, 2, 3, 3-tetramethyloctane
(d) 3-ethyl-2, 2-dimethylpentane
Answer: (b)

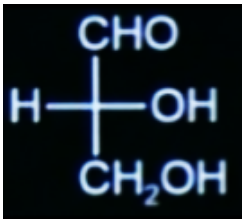
Question: 200 mL of 0.2 M solution of NaOH is mixed with 400 mL of 0.5 M NaOH solution. Molarity of mixture is
Options:
(a) 0.4
(b) 0.6
(c) 4M
(d) 0.8 M
Answer: (a)
Solution:

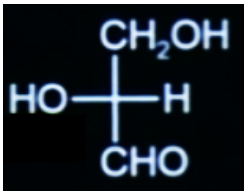
$$\frac{200\times 0.2+400\times 0.5}{600}$$

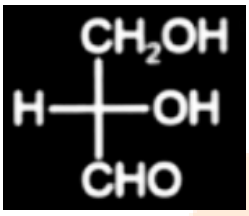
$$\frac{4+20}{60}=\frac{24}{60}0.4$$

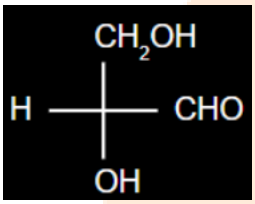
Question: Which of the following does not show disproportionation reaction
Options:
(a) ClO_4^-
(b) ClO_3^-
(c) ClO_2^-
(d) ClO^-
Answer: (a)

Question: Correct structure of L-Glyceraldehyde is
Options:

(a) 

(b) 

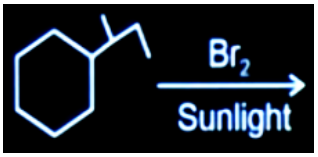
(c) 

(d) 

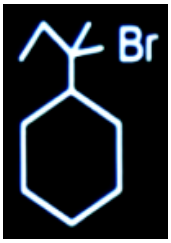
Answer: (b)

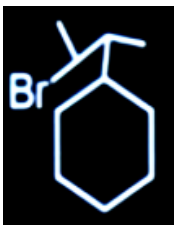
Question: Among Group-15 elements, what is the maximum covalency of an element having weakest E-E bond (E = element)
Options:
(a) 4
(b) 3
(c) 5
(d) 2
Answer: (c)

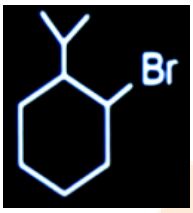
Question: Identity the extensive and intensive property?
Options:
(a) Mass, volume, conductivity - intensive property
(b) Mass, temperature, heat, volume - Extensive property
(c) Mass, volume, internal energy - Extensive property
(d) Density, temperature, moles internal energy - Extensive property
Answer: (c)

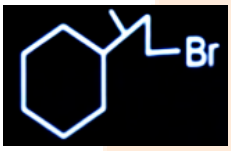
Question: Secondary butyl cyclohexane when reacts with Br2 in presence of sunlight produce 

Options:

(a) 

(b) 

(c) 

(d) 

Answer: (a)

Question: What is the relation between K_{sp} and S of $Zr_3 (PO_4)_4$
Options:

(a) $S = \left(\frac{K_{sp}}{6912}\right)^{\frac{1}{7}}$

(b) $S = \left(\frac{K_{sp}}{144}\right)^{\frac{1}{7}}$

(c) $S = \frac{K_{sp}}{6912}$

(d) None

Answer: (a)

Question: Consider the following statements S-1 and S-2 and choose the correct option.
S-1: During corrosion pure metal acts as anode and impure metal acts as cathode.
S-2: Rate of corrosion is more in alkaline medium than in acidic medium
Options:
(a) Both S-1 and S-2 are correct
(b) Both S-1 and S-2 are incorrect
(c) S-1 is correct but S-2 is incorrect
(d) S-1 is incorrect but S-2 is correct
Answer: (b)

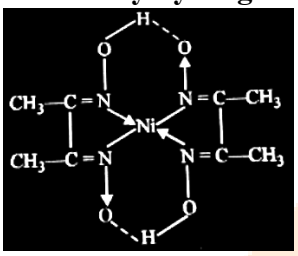
Question: In Ru and Nb, if in Ru, 4d electrons are x and in Nb, 4d electrons are y then find the sum of x and y.

Answer: (7 + 4=11)

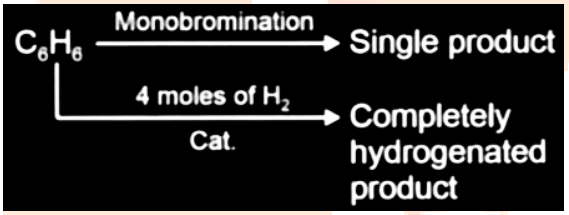
Question: Calculate the radius of first excited state of He+ ion (in Å)

Answer: (1.058)
Solution: 0.529 × 2

Question: Ni^{2+} + 2DMG → Complex
How many hydrogen bonds are present in a molecule of the complex?

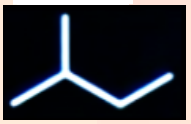


Answer: (2)

Question: 

Find the number of π-electrons in C_6H_6.

Answer: (4)

Question: R - Br + Mg → $\overset{dry\ ether}{A} \rightarrow \overset{H_2O}{}$ 
How many R - Br can form isopentane?

Answer: (4)