

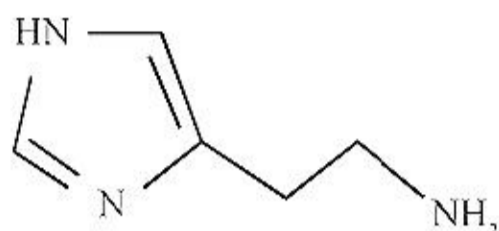
JEE-Main-28-06-2022-Shift-2 (Memory Based)

Chemistry

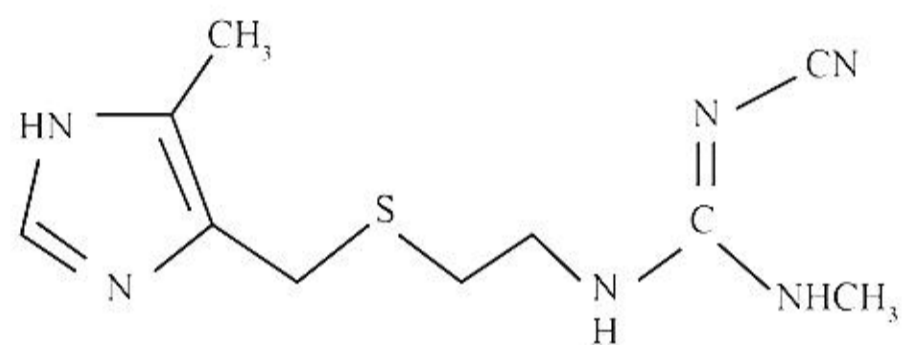
Question: Which of the following is the structure of Tagamet?

Options:

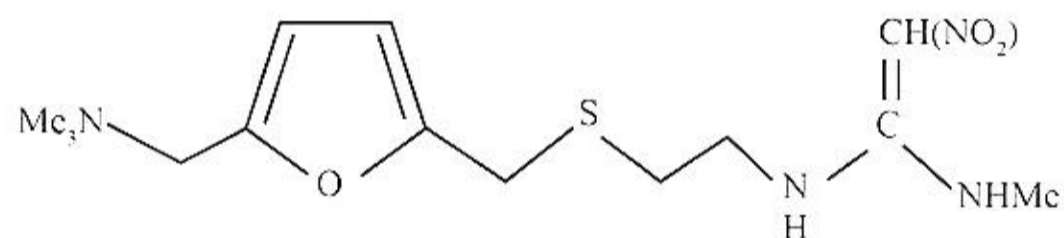
(a)



(b)



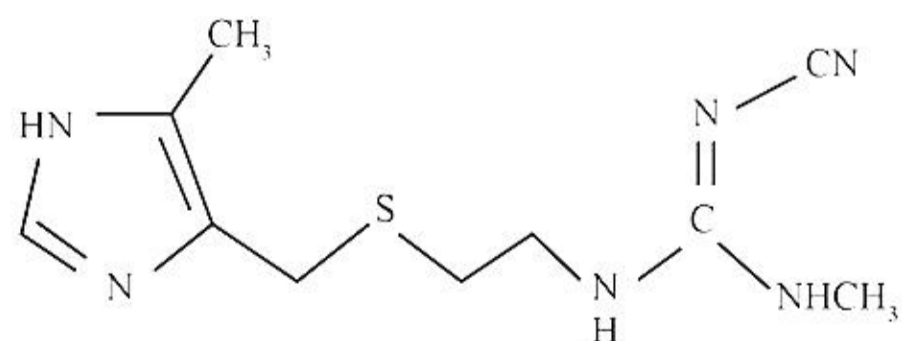
(c)



(d) None of these

Answer: (b)

Solution:



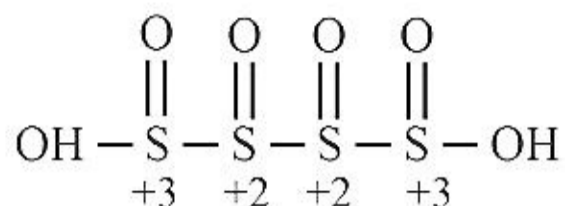
Question: In which of oxyacids of sulphur both sulphur have different oxidation state.

Options:

- (a) $\text{H}_2\text{S}_4\text{O}_6$
- (b) $\text{H}_2\text{S}_2\text{O}_8$
- (c) $\text{H}_2\text{S}_2\text{O}_7$
- (d) All of these

Answer: (a)

Solution:



Question: Match the following.

Column-I	Column-II
(i) Positively charged	(A) Gel
(ii) Negatively charged	(B) Starch
(iii) Macromolecular starch	(C) CuS
(iv) Cheese	(D) $\text{Fe}_2\text{CO}_3 \cdot x \text{H}_2\text{O}$

Options:

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

Answer: (a)

Solution:

- (i) Positively charged $\Rightarrow \text{Fe}_2\text{CO}_3 \cdot x \text{H}_2\text{O}$
- (ii) Negatively charged $\Rightarrow \text{CuS}$
- (iii) Macromolecular starch \Rightarrow Starch
- (iv) Cheese \Rightarrow Gel

Question: A compound has 8% H, 70% C, 16% N, Molecular Mass is 160. Find the formula of compound.

Options:

- (a) $\text{C}_{12}\text{H}_{16}\text{N}_2$
- (b) $\text{C}_{12}\text{H}_{18}\text{N}_2$

(c) $C_{11}H_{16}N$

(d) $C_{12}H_{15}N$

Answer: (a)

Solution:

Compound contain 8% H, 70% C and 16% N

$$\text{No. of moles of C} = \frac{70}{12} = 5.8 \approx 6$$

$$\text{No. of moles of H} = \frac{8}{1} = 8$$

$$\text{No. of moles of N} = \frac{16}{14} = 1 : 1 \approx 1$$

Mole ratio C : H : N = 6 : 8 : 1

Empirical formula = C_6H_8N

Molecular mass = 160

Empirical formula mass = $12 \times 6 + 2 \times 1 + 14 = 94$

$n = 2$

Formula of compound = $(C_6H_8N)_2 = C_{12}H_{16}N_2$

Question: What is correct about photochemical smog?

Options:

(a) It is reducing in nature

(b) It occurs in humid conditions

(c) It is formed due to the action of sunlight on Hydrocarbons

(d) All of these

Answer: (c)

Solution: Photochemical smog results from the action of sunlight on hydrocarbons.

Question: Which of the following is basic oxide?

Options:

(a) CaO

(b) SiO_2

(c) Al_2O_3

(d) NO

Answer: (a)

Solution: CaO - basic oxide

SiO_2 - acidic oxide,

Al_2O_3 - Amphoteric oxide,

NO - neutral oxide

Question: An ideal gas is stored in a vessel of volume 416 ml at temperature 300 K and Pressure 1.5 atm. What is the mass of gas? (Molecular mass of gas 100g/mol)

Options:

(a) 3.32 g

(b) 2.53 g

(c) 3.01 g

(d) 1.92 g

Answer: (b)

Solution:

$$PV = \frac{w}{M}RT$$

$$\therefore w = \frac{PVM}{RT} = \frac{1.5 \times 0.416 \times 100}{0.0821 \times 300} = 2.53 \text{ g}$$

Question: 2.5 g of protein taken and made 500 ml of solution. Osmotic pressure of solution is 5.03×10^{-3} at 300 K. Find the no. of glycine unit.

Options:

(a) 1.9×10^{16} units

(b) 2.8×10^{15} units

(c) 1.2×10^{15} units

(d) 2.2×10^{10} units

Answer: (c)

Solution:

$$\text{Osmotic pressure } (\pi) = \left(\frac{n_2}{V} \right) RT$$

$$\pi V = \frac{w_2 RT}{M_2}$$

$$M_2 = \frac{w_2 RT}{\pi} = \frac{2.5 \times 0.0821 \times 300}{5.03 \times 10^{-8}} = 12.2 \times 10^8 \text{ g}$$

$$\text{No. of glycine units} = \frac{2.5 \times 6.023 \times 10^{23}}{12.2 \times 10^8} = 1.2 \times 10^{15} \text{ units}$$

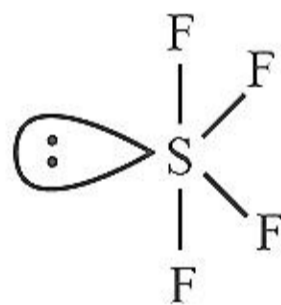
Question: In SF₄ what is the bond angle?

Options:

- (a) 90°, 120°
- (b) 90°, 117°
- (c) 89°, 120°
- (d) 89°, 117°

Answer: (d)

Solution:



Question: The volume of 0.01 M KMnO₄ solution which can oxidize 20 ml of 0.05 M Mohr salt solution in acidic medium is

Options:

- (a) 10 ml
- (b) 20 ml
- (c) 30 ml
- (d) 40 ml

Answer: (b)

Solution: $M_1 V_1 Z_1 = M_2 V_2 Z_2$

$$0.01 \times V_1 \times 5 = 0.05 \times 20 \times 1$$

$$V_1 = 20 \text{ ml}$$

Question: In the buffer solution, having $\text{pH} = 4$ and $\text{pK}_a = 1.3 \times 10^{-5}$, find the ratio of salt/acid is

Options:

(a) $10^{-0.8}$

(b) 0.1

(c) $10^{0.8}$

(d) $10^{-2.1}$

Answer: (a)

Solution: $\text{pK}_a = -\log(1.3 \times 10^{-3})$

$$= 5 - \log 1.3$$

$$= 4.85$$

$$\text{pH} = \text{pK}_a + \log \frac{[\text{salt}]}{[\text{acid}]}$$

$$4 = 4.8 - \log \frac{[\text{salt}]}{[\text{acid}]}$$

$$-0.8 = \log \frac{[\text{salt}]}{[\text{acid}]}$$

$$\frac{\text{salt}}{\text{acid}} = 10^{-0.8}$$

Question: Nitration of aniline with $\text{HNO}_3 + \text{H}_2\text{SO}_4$ gives

Options:

(a) p-nitroaniline

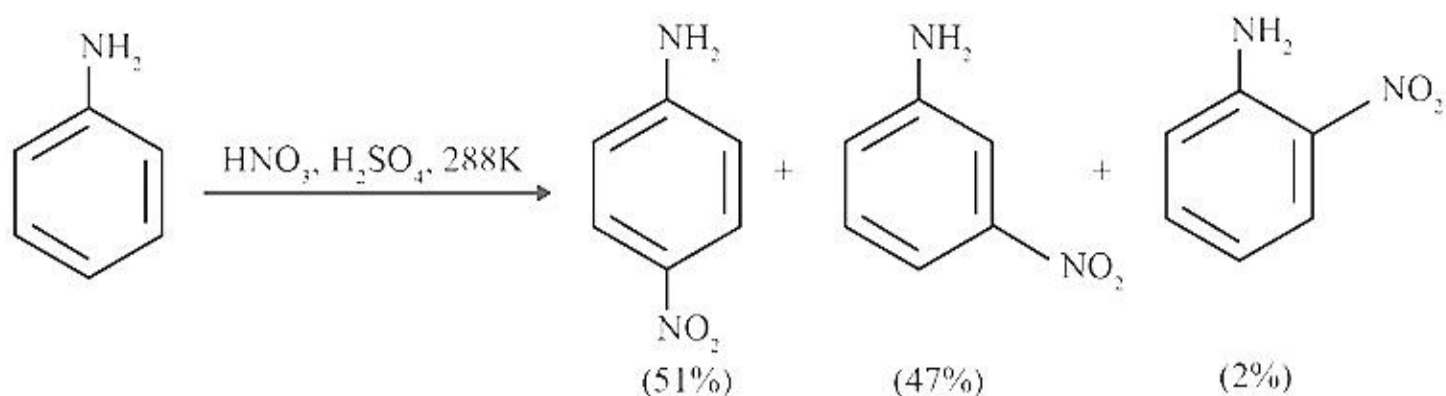
(b) m-nitroaniline

(c) o-nitroaniline

(d) All of these

Answer: (d)

Solution:



Question: Assertion: Natural form of rubber is cis 1,4 polyisoprene

Reason: There are weak vander waals forces giving its coiled structure

Options:

- (a) Both assertion and reason are true, reason is correct explanation of assertion.
- (b) Both assertion and reason are true, but reason is not a correct explanation of assertion.
- (c) Assertion is true, but reason is false
- (d) Assertion is false, but reason is true

Answer: (b)

Solution: Both assertion and reason are true, but reason is not correct explanation of A

Natural rubber may be considered as a linear polymer of isoprene (2-methyl-1, 3-butadiene) and is also called as cis-1, 4-polyisoprene.

The cis-polyisoprene molecule consists of various chains held together by weak van der Waals interactions and has a coiled structure. Thus. It can be stretched like a spring and exhibits elastic properties.

Question: In extraction of copper FeO and FeSiO₃ are respectively

Options:

- (a) slag, gangue
- (b) gangue, slag
- (c) both are slag
- (d) both are gangue

Answer: (b)

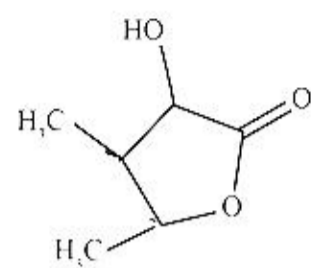
Solution: FeO is gangue and SiO₂ is flux to form slag FeSiO₃.



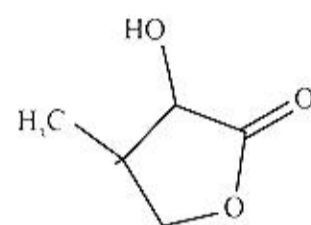
Question: Isobutyraldehyde reacts with K_2CO_3 and formaldehyde to give A. A reacts with HCN to give B. Hydrolysis of B gives a stable carboxylic acid C. What is C?

Options:

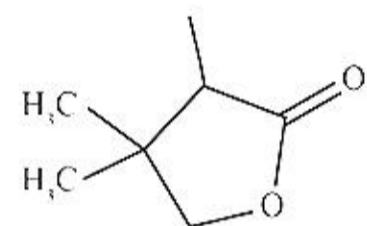
(a)



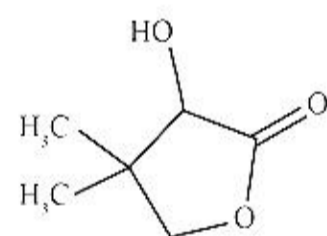
(b)



(c)

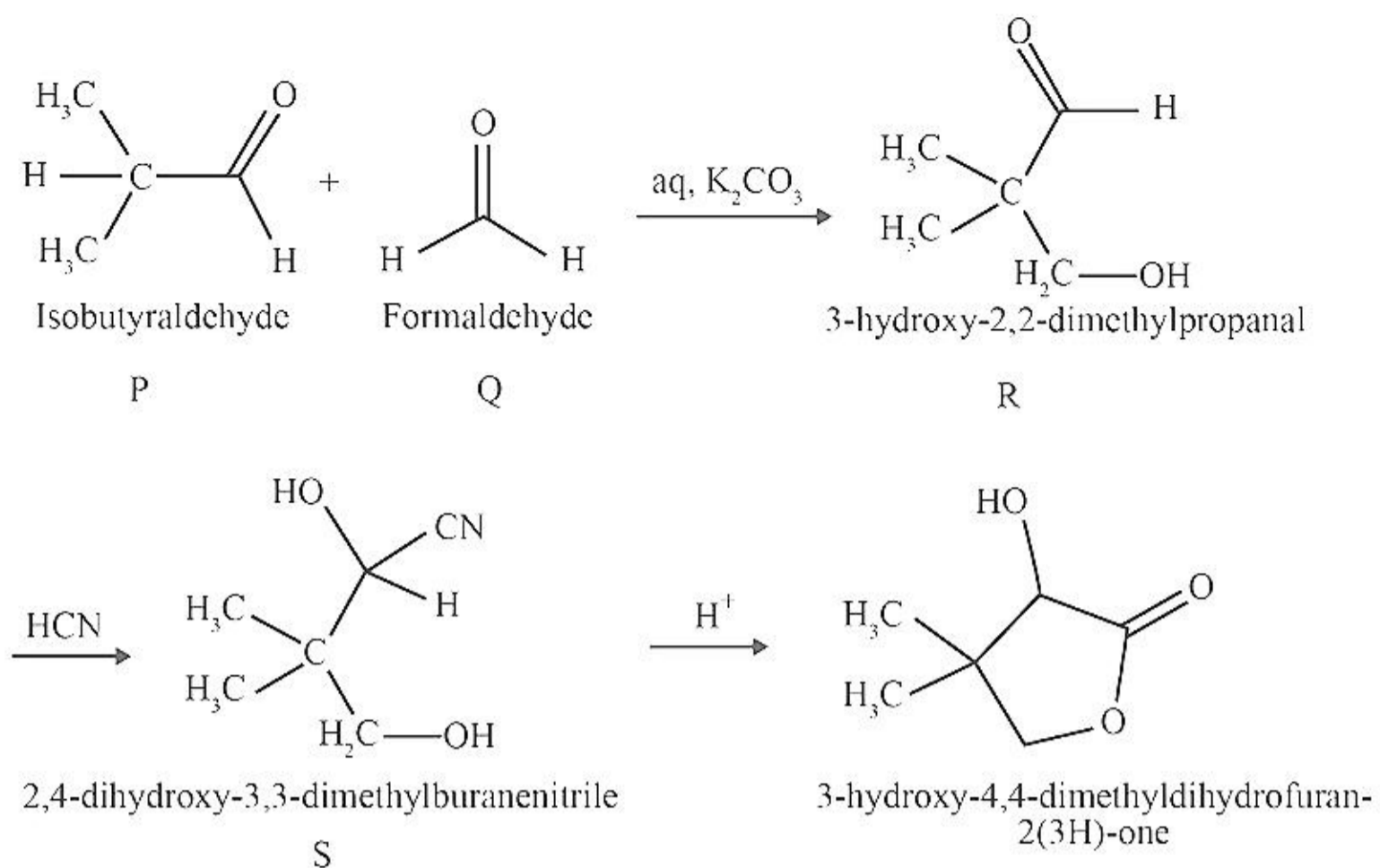


(d)



Answer: (d)

Solution:



Question: The isotopes of Hydrogen differ in the following property

Options:

- (a) Electronic configuration
- (b) No of protons
- (c) Atomic number
- (d) Atomic mass

Answer: (d)

Solution: The three isotopes of hydrogen differ in mass numbers which are 1, 2 and 3 respectively known as protium, deuterium and tritium.

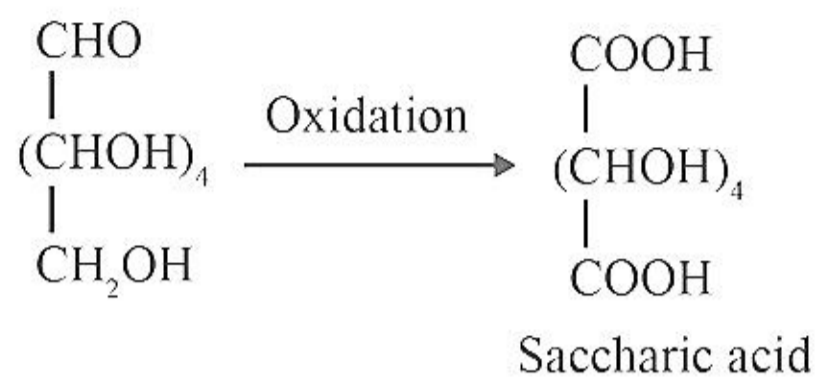
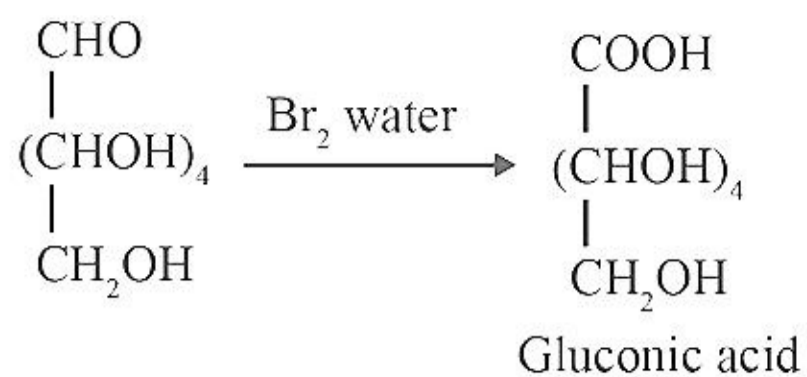
Question: X reacts with $\text{Br}_2/\text{H}_2\text{O}$ to give gluconic acid and reacts with HNO_3 to give saccharic acid. Name X

Options:

- (a) Maltose
- (b) Starch
- (c) Fructose
- (d) Glucose

Answer: (d)

Solution:



Question: Comparison of KE for wavelengths λ and 3λ , keeping work function constant

Options:

(a) $K.E_2 = 9 K.E_1$

(b) $K.E_2 = \frac{1}{9} K.E_1$

(c) $K.E_2 = 3 K.E_1$

(d) $K.E_2 = \frac{1}{3} K.E_1$

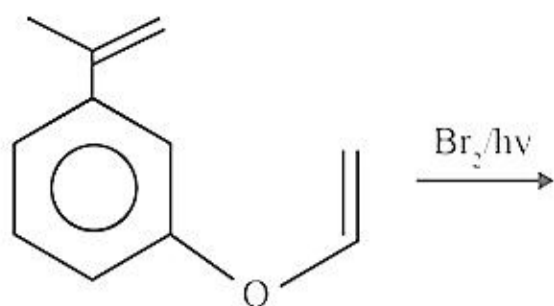
Answer: (b)

Solution: $\lambda = \frac{h}{\sqrt{2m K.E}}$

$$\frac{\lambda}{3\lambda} = \frac{\frac{h}{\sqrt{2m K.E_1}}}{\frac{h}{\sqrt{2m K.E_2}}}$$

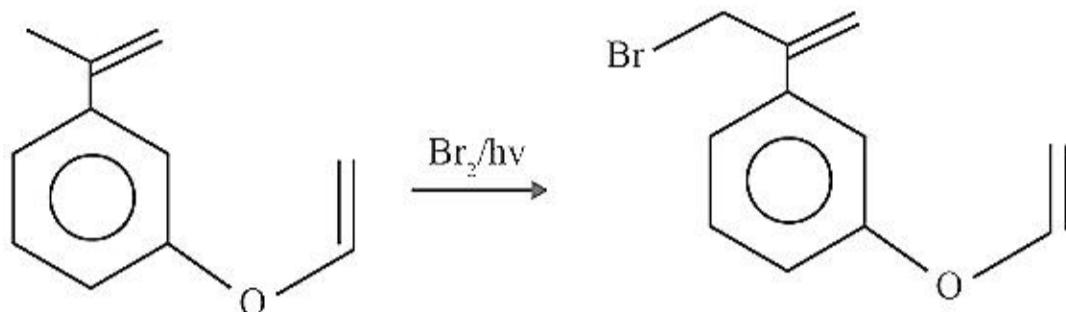
$$K.E_2 = \frac{1}{9} K.E_1$$

Question: Product will have how many Br.....



Answer: 1.00

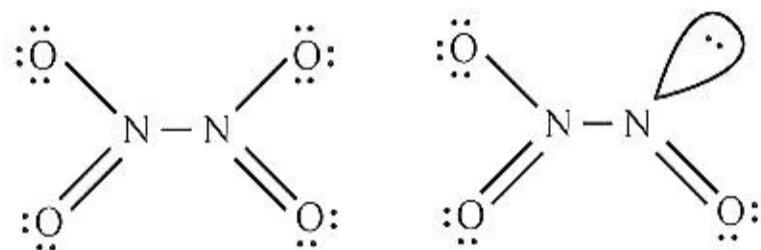
Solution:



Question: How many of the following contain N – N bond N_2O , N_2O_3 , N_2O_4 , N_2O_5 ?

Answer: 2.00

Solution: N_2O_4 and N_2O_3 has one N – N bond as shown below



Question: Consider the following complexes $[\text{Fe}(\text{CN})_6]^{3-}$, $[\text{Ni}(\text{CN})_4]^{2-}$ and $[\text{Fe}(\text{CN})_6]^{4-}$. How many complex(es) is/are paramagnetic?

Answer: 1.00

Solution:

