



JEE (MAIN) 2024

MEMORY BASED QUESTIONS & SOLUTIONS

SHIFT-1

DATE & DAY: 29th January 2024 & Monday

PAPER-1

Duration: 3 Hrs.

Time: 09:00 - 12:00 IST

SUBJECT: CHEMISTRY

ADMISSIONS OPEN FOR CLASS 12+

ACADEMIC SESSION 2024-25



TARGET: JEE (ADV.) 2024

For Class XII Passed Student

VISHESH COURSE

MODE: OFFLINE/ONLINE



CLASS STARTS
08th APRIL, 2024



TARGET: JEE (MAIN) 2024

For Class XII Passed Student

ABHYAAS COURSE

MODE: OFFLINE/ONLINE



CLASS STARTS
08th APRIL, 2024

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Percentile Booster Course (PBC) is for those students who want to boost their percentile in JEE-Main 2024 through a systematic complete course revision & practice plan.

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- Approx 2500 practice Que.
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JEE (Main) 2024 April Attempt में

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SCAN TO
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PART : CHEMISTRY



Determine the value of (a + b + c + d + e), if reaction is balanced with simplest integer coefficients

Ans. (6)

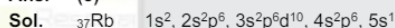


a = 1; b = 2; c = 1; d = 1; e = 1

2. For Rb(Z = 37) correct set of quantum numbers for last electron is :

	n	l	m	s
(1)	4	0	1	+1/2
(2)	3	1	1	+1/2
(3)	5	0	0	+1/2
(4)	3	1	-1	+1/2

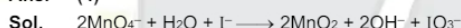
Ans. (3)



3. I^- will oxidise to in presence of alkaline KMnO_4 :

- (1) I_2 (2) IO_4^- (3) IO^- (4) IO_3^-

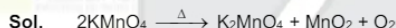
Ans. (4)



4. Heating of KMnO_4 produce:

- (1) $\text{K}_2\text{MnO}_4, \text{MnO}_2, \text{O}_2$ (2) $\text{MnO}_2, \text{K}_2\text{O}, \text{O}_2$ (3) $\text{K}_2\text{MnO}_4, \text{O}_2, \text{MnO}$ (4) $\text{MnO}_2, \text{K}_2\text{O}, \text{O}_2$

Ans. (1)



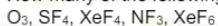
5. How many of the following is/are paramagnetic and have B.O = 1?

Ans. (1)

Sol.

Molecule/ion	H ₂	He ₂ ⁺	N ₂ ²⁻	O ₂ ²⁻	B ₂	F ₂
Bond order	1	0.5	2	1	1	1
Unpaired e ⁻ (s)	0	1	2	0	2	0

6. How many of the following have one lone pair on central atoms?



Ans. (4)

Sol.

Species :	O ₃	SF ₄	XeF ₄	NF ₃	XeF ₆
Lone pair :	1	1	2	1	1

7. Given $k_{\text{net}} = \frac{k_1 k_2}{k_3}$

When E_{a1} = 40 KJ/mol, E_{a2} = 50 KJ/mol and E_{a3} = 60 KJ/mol. Calculate the value of (E_a)_{net} in KJ/mol

Ans. (30)

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Sol. Given $k_{\text{net}} = \frac{k_1 k_2}{k_3}$

We know that

$$k = A e^{-E_a/RT}$$

$$e^{-(E_a)_{\text{net}}} = \frac{e^{-E_{a1}} \times e^{-E_{a2}}}{e^{-E_{a3}}}$$

$$e^{-(E_a)_{\text{net}}} = e^{-(E_{a1} + E_{a2}) - (-E_{a3})}$$

$$(E_a)_{\text{net}} = E_{a1} + E_{a2} - E_{a3}$$

$$= 40 + 50 - 60 = 30 \text{ KJ/mol}$$

8. Which of the following is incorrectly matched?

- (1) Cryolite – Na₃AlF₆
- (2) Fluorspar – BF₃
- (3) Fluorapatite – 3 Ca₃(PO₄)₂·CaF₂
- (4) Carnalite – KCl·MgCl₂·6H₂O

Ans. (2)

Sol. Fluorspar – CaF₂

9. Match the column:

Column-A

- Ziegler Natta catalyst
- Blood pigment
- Wilkinson catalyst
- Vitamin B12

Column-B

- Rh
- Co
- Fe
- Ti

Correct answer is :

- (1) a-(iv), b-(iii), c-(i), d-(ii)
- (2) a-(iii), b-(i), c-(iv), d-(ii)
- (3) a-(ii), b-(i), c-(iv), d-(iii)
- (4) a-(i), b-(ii), c-(iii), d-(vi)

Ans. (1)

Sol. (a) R₃Al + TiCl₄
(b) Haemoglobin (red colored pigment) contains Fe
(c) [RhCl(Ph₃P)₃]
(d) complex of Co

10. Osmotic pressure of a solution at 273K is 2.73 × 10⁻⁵ bar, then osmotic pressure of same solution at 283K is _____ × 10⁻⁴ bar. (Nearest integer)

Ans. (28)

Sol. Osmotic pressure (π) = CRT

$$\frac{\pi_1}{\pi_2} = \frac{T_1}{T_2}$$

$$\Rightarrow \frac{2.73 \times 10^{-5}}{\pi_2} = \frac{273}{283}$$

$$\pi_2 = \left[\frac{2.73 \times 10^{-5}}{273} \right]^{200} 283$$

$$= 2.83 \times 10^{-5}$$

$$= 28.3 \times 10^{-4} \text{ bar}$$

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11. If the percentage by weight of a solution (M.wt, 98 gm/mol) is 31.4% and density of the solution is 1.56 gm/cm³ then the molarity of the solution is _____ M.

Ans. (5)

Sol. molarity = $\frac{\% (w/w) \times \text{density} \times 10}{\text{GMM of solute}}$

$$= \frac{31.4 \times 1.56 \times 10}{98} = 4.99 \approx 5$$

12. **Statement-I:** The electronegativity values of group 14 elements decrease from Si to Pb.

Statement-II: Group 14 contains non-metals, metalloids and metals.

(1) **Statement-I** is incorrect & **Statement-II** is correct.

(2) **Statement-I** is correct & **Statement-II** is incorrect.

(3) Both **Statements I** & **II** are incorrect.

(4) Both **Statements I** & **II** are correct.

Ans. (1)

Sol.

Element :	C	Si	Ge	Sn	Pb
Electronegativity :	2.5	1.8	1.8	1.8	1.9

The electronegativity value for elements from Si to Pb are almost same.

Carbon (C), Silicon (Si) : non-metals

Germanium (Ge) : Metalloid

Tin (Sn), Lead (Pb) : Metals

13. Among the following incorrect option is:

(1) $\Delta G = (-)$ ve, spontaneous

(2) $\Delta G = (+)$ ve, spontaneous

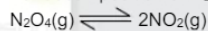
(3) $\Delta G = 0$, equilibrium

(4) $\Delta G = (+)$ ve, nonspontaneous

Ans. (2)

Sol. $\Delta G = (+)$ ve, means process is nonspontaneous

14. For decomposition of N₂O₄ at 300 K value of K_P = 0.246 atm



then value of K_C is _____ × 10⁻² [Nearest integer]

$$\left(\text{Given } R = 0.082 \frac{\text{atm} \times \text{Lit}}{\text{mole} \times \text{K}} \right)$$

Ans. (1)

Sol. $\text{N}_2\text{O}_4(\text{g}) \xrightarrow{T=300\text{K}} 2\text{NO}_2(\text{g})$ K_P = 0.246

$$K_P = K_C (RT)^{\Delta n}$$

$$0.4 = K_C [0.082 \times 300]$$

$$K_C = \left[\frac{0.246}{0.082 \times 300} \right] = \left(\frac{0.246}{24.6} \right) = 0.01 = 1 \times 10^{-2}$$

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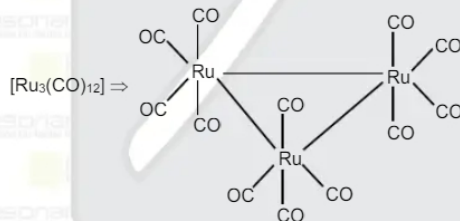
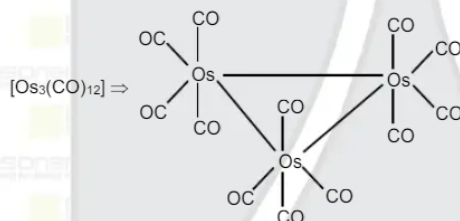
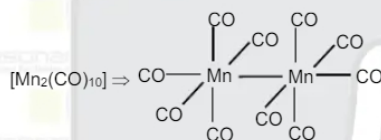
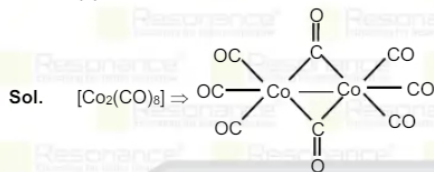
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15. In which of the following complex co form bridge between metal atoms ?

- (1) $\text{Os}_3(\text{CO})_{12}$ (2) $\text{Co}_2(\text{CO})_8$ (3) $\text{Ru}_3(\text{CO})_{12}$ (4) $\text{Mn}_2(\text{CO})_{10}$

Ans. (2)



16. **Assertion** : In a period on going left to right Ionisation energy decrease.

Reason : In a period on moving left to right nuclear charge outweighs the shielding.

In light of above statement identify correct option.

- (1) Both assertion and reason are true and reason is correct explanation of assertion.
 (2) Assertion is wrong reason is true
 (3) Assertion is true and reason is false.
 (4) Both assertion & reason are false

Ans. (2)

Sol. On moving left to right ionisation energy is decrease.

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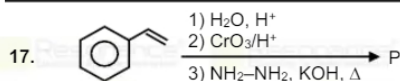
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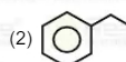
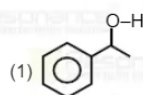
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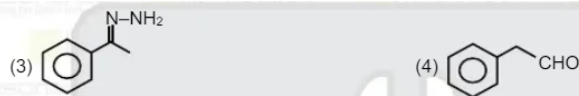
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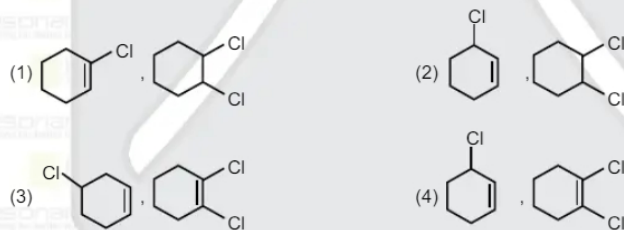
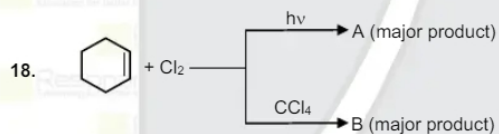
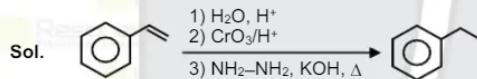


Product P is

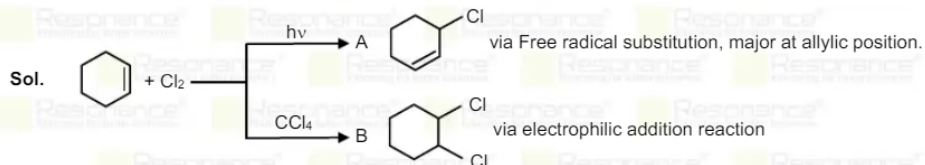




Ans. (2)



Ans. (2)



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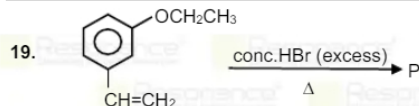
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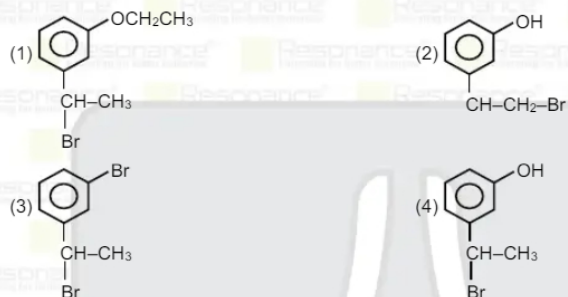
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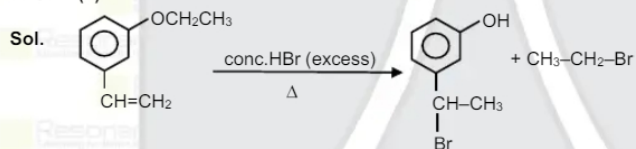
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Product P is:



Ans. (4)



20. What effect is observed in which Interaction occurs between π -bond & lone pair of electrons on adjacent atoms.

- (1) Resonance (2) Hyper conjugate
(3) Inductive effect (4) Electronic effect

Ans. (1)

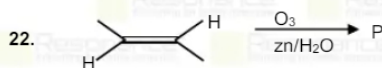
Sol. Interaction between π and lone pair of electrons on adjacent atom results in resonance effect.

21. Type of amino acid obtained on hydrolysis of proteins.

- (1) α - Amino acid (2) γ - Amino acid
(3) β - Amino acid (4) δ - Amino acid

Ans. (1)

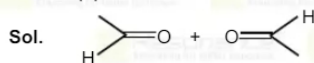
Sol. All naturally occurring proteins are made up of α -amino acid.



the no. of oxygen atom per molecule in product P is.

- (1) 1 (2) 2 (3) 3 (4) 4

Ans. (1)



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23. How many of the following gives positive Fehling solution test.

Acetic acid, Aniline, Acetaldehyde, Acetone, Ethanoylchloride, 2-Methylpropanaldehyde, Crotonaldehyde, Benzanaldehyde, Benzene carboxamide, Ethyne.

Ans. (3)

Sol. Only Acetaldehyde, 2-Methylpropanaldehyde and Crotonaldehyde gives positive Fehling solution test.

24. Arenium ion, which will not be formed in bromination of aniline.




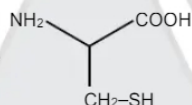
Ans. (1)

25. How many of the following have 'S' as heteroatom.

Furan, Thiophene, Pyrrole, Cysteine, Tyrosine, Tryptophan

Ans. (2)

Sol. (1) Thiophene , (2) Cysteine



26. Appearance of red colour on treatment with Na fusion extract of an organic compound with FeSO_4 in presence of conc. H_2SO_4 indicate element?

- (1) N (2) Br (3) S (4) N & S

Ans. (4)

Sol. Compound with both N & S gives NCS^- ion in sodium fusion extract \rightarrow which gives red colour of $[\text{Fe}(\text{SCN})_3]$ with FeSO_4 & H_2SO_4 .

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JEE (Main) 2023 RESULT

22 वर्षों से लगातार... श्रेष्ठ शिक्षण, श्रेष्ठ परिणाम...

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AIR 5 300/300 Marks KAUSHAL VIJAYVERGIYA	AIR 26 100%ile SOHAM DAS	AIR 29 100%ile ASHIK STENNY	AIR 31 100%ile KRISH GUPTA	AIR 34 100%ile MAYANK SONI	AIR 50 100%ile (Maths) HARSHAL LASOD
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