



JEE (MAIN) 2024

MEMORY BASED QUESTIONS & SOLUTIONS

SHIFT-2

DATE & DAY: 29th January 2024 & Monday

PAPER-1

Duration: 3 Hrs.

Time: 03:00 PM - 06:00 PM

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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COURSE COMMENCEMENT: 5th FEBRUARY 2024

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PART : CHEMISTRY

- Why oxygen shows anomalous behaviour in 16th group?
(1) Due to large size, high electronegativity.
(2) Due to small size, small electronegativity
(3) Due to small size, high electro negativity, absence of vacant d-orbitals
(4) Due to large size, high electronegativity presence of vacant d-orbitals
Ans. (3)
Sol. Generally first member of family shows anomalous behaviour due to small size, absence of vacant d-orbitals in its valence shell.
- Which of the following is act as strong reducing agent ?
(1) Ce⁴⁺ (2) Gd³⁺ (3) Eu²⁺ (4) Tb³⁺
Ans. (3)
Sol. Eu²⁺ act as strong reducing agent changing to the common +3 oxidation state.
- Correct IUPAC Name of K₂MnO₄ is :
(1) Potassium tetraoxidomangnate (vi) (2) Potassium mangnate
(3) Potassium tetraoxido mangnease (vii) (4) Potassium tetraoxido mangnate (vii)
Ans. (1)
Sol. Correct IUPAC Name
Potassium tetraoxidomangnate (vi)
- On reaction of which of the following Nessler's reagent give Brown precepitate.

(1) NH₃ (2) SO₂ (3) Cl₂ (4) CO₂

Ans. (1)

Sol. Nessler's reagent \Rightarrow alkaline solution of K₂[HgI₄]
 $\text{NH}_4^+ / \text{NH}_3(\text{aq}) + \text{K}_2[\text{HgI}_4] \longrightarrow \text{HgO} \cdot \text{Hg}(\text{NH}_2)\text{I} \downarrow + \text{KI} + \text{H}_2\text{O}$
(Iodide of Millon's base)
Brown ppt.

5. **Statement-1** : F has highest electronegativity in its group.
Statement-2 : O has least negative electron gain enthalpy in its group.

- (1) Both statements are correct
(2) Both statements are incorrect
(3) Statement-1 is incorrect, Statement-2 is correct
(4) Statement-1 is correct, Statement-2 is incorrect

Ans. (1)

Sol. F has highest EN(4) in Periodic table. Its value on Pauling scale is 4
Electron affinity order of (magnitude of electron gain enthalpy)
Family is all one positive S > Se > Te > Po > O.
Element : O S Se Te Po
Electron gain enthalpy : -141 -200 -195 -190 -174
(kJ mol⁻¹)

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6. Which of the following has highest ionisation enthalpy?

- (1) N (2) C (3) Si (4) Al

Ans. (1)

Sol. Element : C N Al Si
 $\Delta H_i/\text{kJ mol}^{-1}$: 1086 1402 577 786
Due to half filled electron configuration nitrogen has highest ionisation enthalpy

7. $\text{Ni}^{+2} + x \longrightarrow$ Rosy red ppt.

[X] is :

- (1) DMG (2) p-nitrophenol (3) FeCl₃ (4) None of these

Ans. (1)

Sol. $\text{NiCl}_2 + 2\text{NH}_4\text{OH} + 2\text{DMG} \longrightarrow [\text{Ni}(\text{DMG})_2] \downarrow + 2\text{NH}_4\text{Cl} + 2\text{H}_2\text{O}$
(X) Rosy red ppt

8. Select correct option regarding Zn, Cd & Hg

- (1) Hard metals
(2) Paramagnetic in nature
(3) High enthalpy of atomisation
(4) Hg shows variable valency where as Zn, Cd does not

Ans. (4)

Sol. Hg shows variable valency
 $\text{Hg}_2^{2+} \rightarrow +1, \text{Hg}^{+2} \rightarrow +2$
Whereas Zn & Cd shows only +2 valency

9.

	Column-I		Column-II
(A)	Lyman	(P)	IR
(B)	Paschen	(Q)	UV
(C)	Balmer	(R)	IR
(D)	Pfund	(S)	Visible

Select correct option :

- (1) A - Q, B - P, C - S, D - R (2) A - R, B - Q, C - P, D - R
(3) A - R, B - P, C - Q, D - S (4) A - S, B - R, C - P, D - Q

Ans. (1)

Sol. Lyman series occurs in UV zone, Balmer series few lines in visible zone where as for all other series corresponding zone is IR zone.

10. The oxidation state of Fe in the complex formed in brown ring test is :

Ans. (1)

Sol. $[\text{Fe}(\text{H}_2\text{O})_5(\text{NO})]\text{SO}_4$ Brown ring complex

In it NO^+ is present

$$x + 5(0) + (1) + (-2) = 0$$

$$\text{or } x = 1$$

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11. How many of the following have zero dipole moment ?

NH_3 , H_2O , HF , CO_2 , SO_2 , BF_3 , CH_4

Ans. (3)

Sol. CO_2 , BF_3 , CH_4 have zero dipole moment.

So Answer is 3

12. 50 ml of 0.5 M oxalic acid is neutralize by 25 ml of NaOH, then amount of NaOH in 50 ml of solution is _____ gram (Nearest integer)

Ans. (4)

Sol. $\text{H}_2\text{C}_2\text{O}_4 + 2\text{NaOH} \longrightarrow \text{Na}_2\text{C}_2\text{O}_4 + 2\text{H}_2\text{O}$

Milimole 0.5×50

25 50 milimole

Milimole of NaOH = $M \times 25 = 50$

molarity = 2M

Milimole of NaOH in 50 ml = $2 \times 50 = 100$

Mass of NaOH = $[100 \times 40] \times 10^{-3}$ gram = 4 gram

13. Enthalpy of vapourisation of CCl_4 is 30.5 kJ/mole, then heat required to vaporise 284 gram CCl_4 is _____ kJ. (nearest Integer)

Ans. (56)

Sol. GMM of CCl_4 = 154 gram / mol

$$\text{No. of mole of } \text{CCl}_4 = \left(\frac{284}{154} \right)$$



$$\text{Mole} \left(\frac{284}{154} \right) \quad \left(\frac{284}{154} \right)$$

$$\text{Heat of vapourisation} = \left(\frac{284}{154} \right) \times 30.5 = 56.2 \text{ kJ}$$

14. Radioactive decay of Br^{82} ($Z = 35$) isotope has half-life of 36 hours, the fraction of remaining particle in one day is _____ $\times 10^{-2}$ (Nearest integer)

{Given antilog (0.2006) = 1.587, $\log 2 = 0.30$ }

Ans. (63)

$$\text{Sol. } \lambda = \frac{\ln 2}{t_{1/2}} = \frac{\ln 2}{36}$$

$$\lambda = \frac{1}{t} \ln \left(\frac{N_0}{N} \right)$$

$$\frac{\ln 2}{36} = \frac{1}{24} \ln \left(\frac{N_0}{N} \right)$$

$$\frac{\ln \left(\frac{N_0}{N} \right)}{\ln 2} = \frac{24}{36} = \frac{2}{3}$$

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$$\log\left(\frac{N_0}{N}\right) = \frac{2}{3} \times 0.30$$

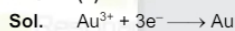
$$\log\left(\frac{N_0}{N}\right) = 0.2$$

$$\frac{N_0}{N} = 1.587$$

$$\Rightarrow \left(\frac{N}{N_0}\right) = \left(\frac{1}{1.587}\right) = 0.63 = 63 \times 10^{-2}$$

15. During electrolysis of AuCl_4^- current is circulated for 10 min. and given mass of cathode is 1.318 gram. Then amount of charge circulated during electrolysis is _____ $\times 10^{-2}$ F. (nearest integer)
[Given atomic mass of Au = 197]

Ans. (2)



W = Zit

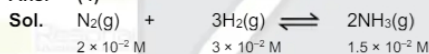
$$1.318 = \left(\frac{197}{3 \times 96500}\right) \times \text{Charge}$$

$$\text{Charge} = \frac{1.318 \times 3 \times 96500}{197} \text{ C}$$

$$\text{Charge} = \left(\frac{1.318 \times 3 \times 96500}{197 \times 96500}\right) \text{ F} = 0.02 \text{ F} = 2 \times 10^{-2} \text{ F}$$

16. In a closed container equilibrium concentration of $\text{NH}_3(\text{g})$, $\text{N}_2(\text{g})$ and $\text{H}_2(\text{g})$ is $1.5 \times 10^{-2} \text{ M}$, $2 \times 10^{-2} \text{ M}$ and $3 \times 10^{-2} \text{ M}$ respectively, then equilibrium constant for formation of $\text{NH}_3(\text{g})$ at 500°C is _____ $\times 10^2$. (nearest integer)

Ans. (4)



$$K_c = \frac{[\text{NH}_3]^2}{[\text{N}_2][\text{H}_2]^3} = \frac{(1.5 \times 10^{-2})^2}{(2 \times 10^{-2})(3 \times 10^{-2})^3} = \left(\frac{2.25 \times 10^{-4}}{2 \times 10^{-2} \times 27 \times 10^{-6}}\right)$$

$$= \frac{2.25 \times 10^4}{2 \times 27} = \frac{225}{2 \times 27} \times 10^2 = 4.16 \times 10^2$$

Ans. (4)

17. Using 2s and 2p orbital intermixing total antibonding molecular orbital _____ are formed.

Ans. (1)

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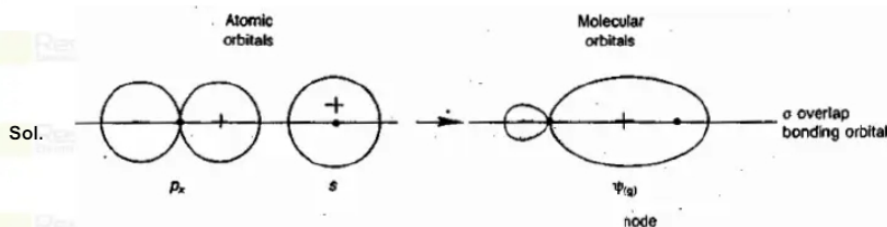
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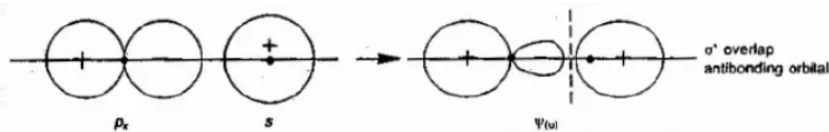
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
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18. IUPAC name of the compound  is :

- (1) Cyclohex-2-en-1-ol (2) Cyclohex-1-en-3-ol
 (3) 3-Hydroxycyclohexene (4) Cyclohex-1-en-3-ol

Ans. (1)

Sol.  Here -OH is a functional group and counting begins from -OH group.

19. Correct match of the following compounds with given pKa value is

	Column-I		Column-II
(A)	Phenol	(P)	7.1
(B)	Ethanol	(Q)	15.1
(C)	para-Nitrophenol	(R)	10.3
(D)	meta-Nitrophenol	(S)	8.3

- (1) A - R, B - Q, C - P, D - S (2) A - Q, B - P, C - R, D - S
 (3) A - P, B - Q, C - R, D - S (4) A - S, B - R, C - Q, D - P

Ans. (1)

Sol. p-Nitrophenol is more acidic than m-nitrophenol, than phenol whereas ethanol is least acidic, stronger the acid, lesser the value of pKa.

20. The correct ascending order of acidic strength of the following compound is :

- (A) $\text{CH}\equiv\text{CH}$ (B) $\text{CH}_3-\underset{\text{CH}_3}{\overset{\text{CH}_3}{\text{C}}}-\text{H}$ (C) $\text{CH}_2=\text{CH}_2$ (D) CH_3-CH_3





- (1) $\text{B} < \text{D} < \text{C} < \text{A}$ (2) $\text{C} < \text{B} < \text{A} < \text{D}$ (3) $\text{A} < \text{D} < \text{B} < \text{C}$ (4) $\text{D} < \text{B} < \text{C} < \text{A}$

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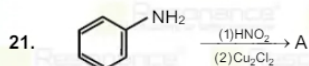
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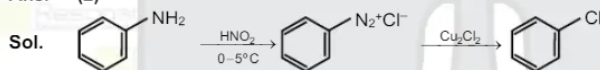
Ans. (1)

Sol. sp hybrid C is more electronegative than sp^2 , than sp^3 .



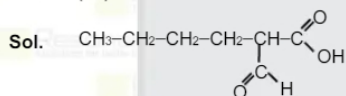
- (1)  (2)  (3)  (4) 

Ans. (2)



22. Sum of total no. of σ and π bond in 2-formylhexanoic acid is :

Ans. (23)



No. of σ bond = 21

No. of π bond = 2

23. Correct match is :

	Column-I		Column-II
(A)	Starch	(P)	α -glucose
(B)	Cellulose	(Q)	β -glucose
(C)	Nucleic acid	(R)	α -amino acid
(D)	Protein	(S)	Nucleotide

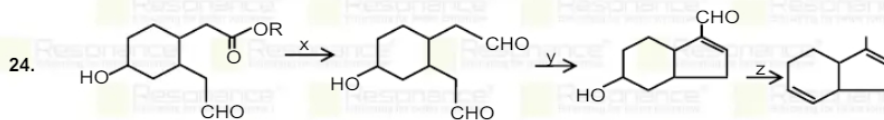
(1) A - P, B - R, C - S, D - R

(2) A - R, B - Q, C - S, D - P

(3) A - P, B - Q, C - R, D - S

(4) A - P, B - Q, C - S, D - R

Ans. (4)



x, y, z are respectively

(1) Dibal-H, NaOH aq/ Δ , Zn Hg-conc HCl, Δ

(2) Dibal-H, NaOH alc/ Δ , $\text{NH}_2\text{-NH}_2/\text{KOH}$, Δ

(3) LiAlH_4 , NaOH aq/ Δ , Zn, Hg-conc HCl, Δ

(4) LiAlH_4 , NaOH aq/ Δ , $\text{NH}_2\text{-NH}_2/\text{OH}^-$, Δ

Ans. (1)

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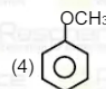
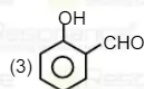
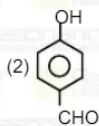
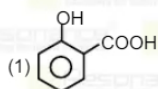
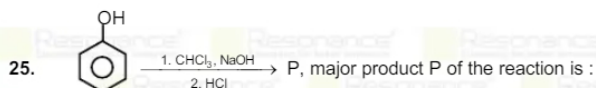
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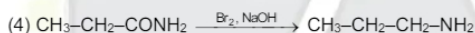
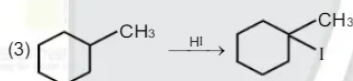
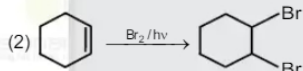
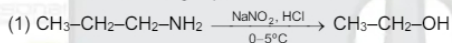
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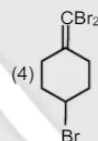
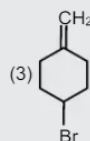
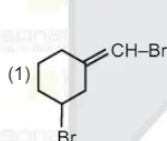
Ans. (3)

26. Which of the following represent correct reaction



Ans. (3)

27. Which of the following show geometrical isomerism.



Ans. (1)

28. **Statement-I** : Alkyl halide can be directly converted to alkyl isocyanide.

Statement-II : The reagent used to convert alkyl halide to alkyl isocyanide is AgCN.

(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. (4)

29. Different adsorption method used in which type of chromatography.
 X → TLC Y → Column chromatography Z → Paper chromatography.
 (1) Only X (2) Only Y (3) Only X and Y (4) all X, Y and Z
 Ans. (4)

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JEE (Advanced) 2023 RESULT

AIR 7 BIKKINA A. CHOWDARY All India Ranks (AIR-CRL) in Top 50 : 8 Top 100 : 15 All Students are from Our Offline/Online Classroom Programs	AIR 22 DESHANK P. SINGH	AIR 26 MAYANK SONI	AIR 29 TANISHQ M MANDHANE	AIR 32 KRITIN GUPTA
	AIR 33 NAMAN GOVAL	AIR 37 S S SUMEDH	AIR 44 KAUSHAL VIJAYVERGIYA	

JEE (Main) 2023 RESULT

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

6 AIRs in TOP-50

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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Class: V to XII & XII+



JEE
(Advanced)



JEE
(Main)



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(UG)

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