 **Resonance**[®]
Educating for better tomorrow






JEE
(Main)
PAPER-1 (B.E./B. TECH.)

2023


COMPUTER BASED TEST (CBT)
Memory Based Questions & Solutions

Date: 01 February, 2023 (SHIFT-2) | TIME : (3.00 p.m. to 6.00 p.m)
Duration: 3 Hours | Max. Marks: 300

SUBJECT: CHEMISTRY

Resonance Eduventures Ltd.
Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005
Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222
To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029
Toll Free : 1800 258 5555  **7340010333**  [facebook.com/ResonanceEdu](https://www.facebook.com/ResonanceEdu)  twitter.com/ResonanceEdu  www.youtube.com/resowatch  blog.resonance.ac.in

This solution was download from Resonance JEE (Main) 2023 Solution portal

 | **JEE(Main) 2023 | DATE : 01-02-2023 (SHIFT-2) | PAPER-1 | MEMORY BASED | CHEMISTRY**

PART : CHEMISTRY

1. Give correct order of bond enthalpy for following :
- | | |
|---------------------------------|---------------------------------|
| (1) C-C > Si-Si > Ge-Ge > Sn-Sn | (2) C-C > Si-Si > Sn-Sn > Ge-Ge |
| (3) Si-Si > C-C > Ge-Ge > Sn-Sn | (4) Si-Si > Sn-Sn > Ge-Ge > C-C |

Ans. (1)

Sol. As bond length increases, bond energy decreases.

2. Magnetic moment (spin only) of $[\text{Mn}(\text{H}_2\text{O})_6]^{2+}$ is :
 (1) $\sqrt{35}$ BM (2) $\sqrt{3}$ BM (3) $\sqrt{6}$ BM (4) $\sqrt{24}$ BM

Ans. (1)

Sol. $[\text{Mn}(\text{H}_2\text{O})_6]^{2+}$



Number of unpaired electron = 5

$$\mu = \sqrt{n(n+2)} = \sqrt{5 \times 7} = \sqrt{35} \text{ BM}$$

3. In composition of copper matte how many of following are present ?

Cu_2S , FeSiO_3 , CaSiO_3 , FeS , CuCO_3

Ans. (2)

Sol. Copper matte mostly contain Cu_2S and some FeS .

4. Which of the following has two structural isomers ?

(1) $[\text{Co}(\text{NH}_3)_5\text{Cl}]^{+2}$ (2) $[\text{Co}(\text{NH}_3)_5(\text{NO}_2)]^{+2}$ (3) $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^{+2}$ (4) $[\text{Co}(\text{H}_2\text{O})_6]^{+3}$

Ans. (2)

Sol. $[\text{Co}(\text{NH}_3)_5(\text{NO}_2)]^{+2}$ will show structural isomerism as NO_2^- is ambidentate ligand

$\text{NO}_2^- \rightarrow$ nitrito-N

$\text{ONO}^- \rightarrow$ nitrito-O

5. Which element is not present in Nessler's reagent ?

(1) K (2) I (3) Hg (4) O

Ans. (4)

Sol. Nessler's reagent is alkaline K_2HgI_4 .

6. Among the following which is set of isoelectronic species ?

(1) Ca^{+2} , K^+ , Sc^{+3} , Cl^- (2) N^{-3} , Ca^{+2} , Cl^- , K^+

(3) P^{-3} , Al^{+3} , Ca^{+2} , Cl^- (4) S^{-2} , Mg^{+2} , Na^+ , O^{-2}

Ans. (1)

Sol. Ca^{+2} , K^+ , Sc^{+3} , Cl^- contain same no. of electrons.

Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No. : +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | [facebook.com/ResonanceEdu](https://www.facebook.com/ResonanceEdu) | [twitter.com/ResonanceEdu](https://www.twitter.com/ResonanceEdu) | www.youtube.com/resonance | [blog.resonance.ac.in](https://www.blog.resonance.ac.in)

This solution was download from Resonance JEE(Main) 2023 Solution portal

PAGE # 1

Resonance
 Empowering the future
 | JEE(Main) 2023 | DATE : 01-02-2023 (SHIFT-2) | PAPER-1 | MEMORY BASED | CHEMISTRY

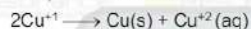
7. **Statement-I** : Cu^{2+} is stable in water as compared to Cu^{+1}

Statement-II : Hydration energy of Cu^{2+} is less than Cu^{+1}

- (1) Both **statement I** and **II** are correct.
 (2) **Statement I** is correct while **statement II** is incorrect.
 (3) **Statement I** is incorrect while **statement II** is correct.
 (4) Both **statement I** and **statement II** are incorrect.

Ans. (2)

Sol. In aqueous solution Cu^{+1} is unstable and it disproportionate.



Hydration energy of Cu^{2+} is higher than Cu^{+1} and this compensate it's ionisation energy.

8. Regarding H_2O_2 and O_2F_2

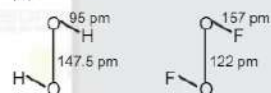
Bond length of O-O in H_2O_2 is X than O-O bond length in O_2F_2

Bond length of O-H in H_2O_2 is Y than O-F bond length in O_2F_2 . Then :

- (1) X : Shorter Y : Shorter (2) X : Shorter Y : Longer
 (3) X : Longer Y : Longer (4) X : Longer Y : Shorter

Ans. (4)

Sol.



O-O BL in H_2O_2 is longer than O-O BL in O_2F_2

O-H BL in H_2O_2 is shorter than O-F BL in O_2F_2

U-F BL in H_2O_2 is shorter than U-F BL in O_2F_2

9. Which of the following order is incorrect regarding magnitude of first electron gain enthalpy ?
 (1) $Cl < F$ (2) $O < S$ (3) $Te > O$ (4) $S > Se$

Ans. (1)

Sol. For halogens the electron gain enthalpy order $Cl > F > Br > I$
 For oxygen family the electron gain enthalpy order $S > Se > Te > O$

10. A compound dissociate according to 1st order kinetics with half-life 50 min. The time required to reduce it's concentration 1/4 of it's initial concentration ismin.

Ans. (100)

Sol. $C_0 \xrightarrow{t_{1/2}} \frac{C_0}{2} \xrightarrow{t_{1/2}} \frac{C_0}{4}$
 total time = $2t_{1/2} = 100$ min.

11. An atom forms two lattices FCC and BCC. The edge length of FCC lattice is 2.5 \AA and edge length of BCC lattice is 2 \AA . Then find the ratio of density of FCC to density of BCC.

Ans. (1)

Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | [facebook.com/ResonanceEdu](https://www.facebook.com/ResonanceEdu) | twitter.com/ResonanceEdu | www.youtube.com/reswatch | blog.resonance.ac.in

This solution was download from Resonance JEE(Main) 2023 Solution portal

PAGE # 2

Resonance Educating for better tomorrow | JEE(Main) 2023 | DATE : 01-02-2023 (SHIFT-2) | PAPER-1 | MEMORY BASED | CHEMISTRY

Sol. $d = \frac{ZM}{a^3 N_A}$

or $d \propto \frac{Z}{a^3}$

$$\frac{d_{FCC}}{d_{BCC}} = \frac{4}{(2.5)^3} \times \frac{(2)^3}{2} = 1.024$$

12. An aqueous solution have 10% (w/w) CH_3COOH . If degree of dissociation of CH_3COOH in solution is 20%, then depression in freezing point isK

[Nearest integer]

[Given $K_f(H_2O) = 1.86 \text{ K.Kg/Mole}$]

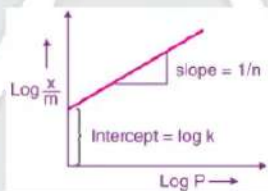
Ans. (4)

Sol. For CH_3COOH

$$i = 1 + (n - 1)\alpha = 1 + (2 - 1)0.2 = 1.2$$

$$\Delta T_f = i K_f \times m = 1.2 \times 1.86 \times \frac{100}{54} = 4.1 \text{ K}$$

13. Following graph is drawn between $\log \left(\frac{x}{m} \right)$ with $\log P$



the graph follow equation $y = 3x + 2.505$ then value of $\log K$ and slope $\left(\frac{1}{n} \right)$ is :

- (1) 2.505, 3 (2) 3, 2.505 (3) 2, 2.505 (4) 2.505, 2

Ans. (1)

Sol. For straight line $y = mx + c$

$$\log \left(\frac{x}{m} \right) = m[\log P] + C$$

From freundlich adsorption

$$\log\left(\frac{x}{m}\right) = \frac{1}{n} \log P + \log K$$

$$\text{so } \frac{1}{n} = 3 \text{ and } \log K = 2.505$$

Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | facebook.com/ResonanceIndia | twitter.com/ResonanceIndia | www.youtube.com/reswatch | blog.resonance.ac.in

This solution was download from Resonance JEE(Main) 2023 Solution portal

PAGE # 3

| JEE(Main) 2023 | DATE : 01-02-2023 (SHIFT-2) | PAPER-1 | MEMORY BASED | CHEMISTRY

14. For a reversible reaction
 $\text{PCl}_5(\text{g}) \rightleftharpoons \text{PCl}_3(\text{g}) + \text{Cl}_2$
 if 'He' gas is added at constant volume to the reaction mixture at equilibrium then the equilibrium
 (1) Shifts towards forward direction (2) Shifts towards backward direction
 (3) Shifts neither direction (4) PCl_5 and Cl_2 conc. increases

Ans. (3)

Sol. Inert gas addition has no effect at constant volume.

15. Which of the following compound is used in the preparation of D_2O_2 in laboratory.

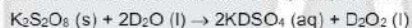
(1) $\text{K}_2\text{S}_2\text{O}_8$ (2) H_3BO_3 (3) HNO_4 (4) $\text{Ca}(\text{HCO}_3)_2$

Ans. (1)

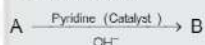
Sol. Peroxodisulphate, obtained by electrolytic oxidation of acidified sulphate solutions at high current density, on hydrolysis yields hydrogen peroxide.



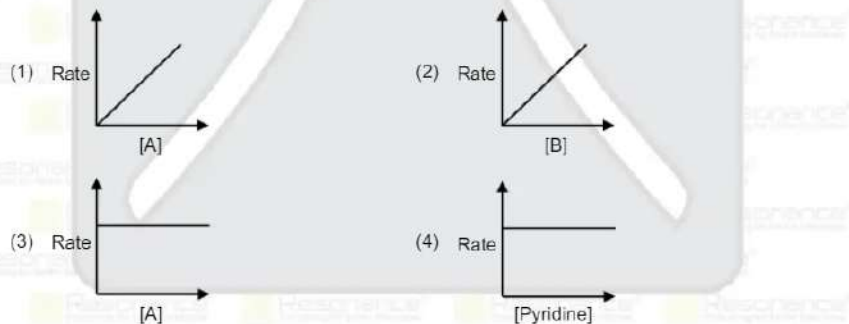
This method is now used for the laboratory preparation of D_2O_2 .



16. For a 1st order reaction



Identify the correct graph.



Ans. (4)

Sol. In chemical reaction concentration of Catalyst remain constant.

17. No. of tranquilizers
 Veronal, Valium, Chloridiazepoxide, Chloroxylenol

Ans. (3)

Sol. Veronal, Valium, and Chloridiazepoxide are tranquilizers.

Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

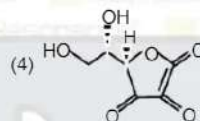
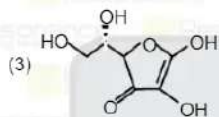
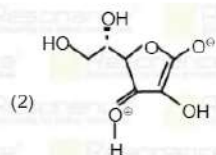
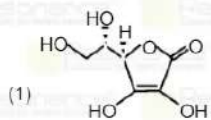
To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | facebook.com/ResonanceIndia | twitter.com/ResonanceIndia | www.youtube.com/reswatch | blog.resonance.ac.in

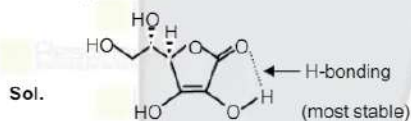
This solution was download from Resonance JEE(Main) 2023 Solution portal

PAGE # 4

18. Most stable structure of Ascorbic acid is



Ans. (1)



19. Which industry put least impact on global warming.

(1) Cement industry

(2) Urea industry

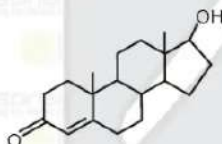
(3) Electricity produced by thermal power plant.

(4) Steel manufacture.

Ans. (2)

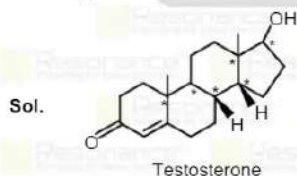
Sol. In urea industry N_2 , CO_2 and H_2 are consumed and no green house gases are emitted.

20.



Total number of unsymmetrical carbon in testosterone is

Ans. (6)



Total number of unsymmetrical carbon = 6

Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website: www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | [f](https://www.facebook.com/resonanceedu) [i](https://www.instagram.com/resonanceedu) [in](https://www.linkedin.com/company/resonanceedu) [t](https://twitter.com/resonanceedu) www.youtube.com/resonance [B](https://www.blog.resonance.ac.in) [blog.resonance.ac.in](https://www.blog.resonance.ac.in)

This solution was download from Resonance JEE(Main) 2023 Solution portal

PAGE # 5

21. $\text{C}_2\text{H}_2 + \text{HF} \xrightarrow{\Delta}$ Product

What is the product of the reaction.

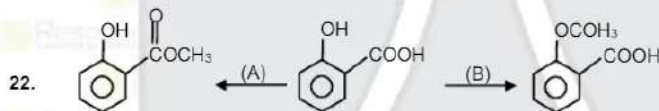
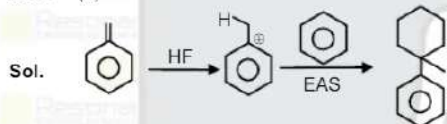
(1)

(2)

(3)

(4)

Ans. (1)



(A) & (B) are respectively,

(A)

(1) CH_3OH ,

(2) $\text{CH}_3\text{-C(=O)-O-C(=O)-CH}_3$,

(3) CH_3OH ,

(4) $\text{CH}_3\text{-NH}_2$,

(B)

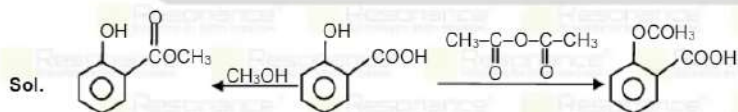
$\text{CH}_3\text{-C(=O)-O-C(=O)-CH}_3$

CH_3OH

CH_3CONH_2

$\text{CH}_3\text{-C(=O)-O-C(=O)-CH}_3$

Ans. (1)



Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website: www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | facebook.com/resonanceedu | twitter.com/resonanceedu | www.youtube.com/reswatch | blog.resonance.ac.in

This solution was download from Resonance JEE(Main) 2023 Solution portal

PAGE # 6



TO KNOW MORE

Call: 0744-2777777,
8441024095

TARGET: JEE (ADV.) 2023

Polish your subject knowledge with the guidance of
Top Notch Sr. Faculty of Resonance

SPARK

15 WEEKS COMPACT COURSE

OFFLINE / ONLINE

CLASS
STARTS

6th FEBRUARY
2023

ACADEMIC FEATURES

- Course Duration: 15 Weeks
- Total No. of Lectures: 234 (P: 79 | C: 78 | M: 76)
- Duration of One Lecture: 1.5 hrs. (90 Minutes)

Course Features

- Study Material
- Doubt Classes
- Build up support of recorded lectures
- Port / Full Solution Test Series



Classroom Teaching Hours: **351 Hrs.**
 Testing Duration: **60 Hrs.**
 Total Academic Hours: **411 Hrs.**

Facilities for Offline Students
 In-house Computer Lab Self Study Rooms for Drive & Gate

RESONANCE
 JEE (Adv.) 2022

TARGET: JEE (Main) 2023

Boost your Percentile with

PERCENTILE BOOSTER COURSE

8 WEEKS COMPACT COURSE

OFFLINE / ONLINE

CLASS STARTS

6th FEBRUARY 2023

COURSE FEATURES

- Complete Course Coverage
- 25 Chapter wise Test
- Regular Practice through 33 Daily Online Practice Test
- 5 Full Syllabus Test
- 3 Joint Preparatory Test
- Approx 2500 practice Que.
- 113 Teaching hours
- 99 Testing Hours
- Regular Test discussion classes for concept clearance
- Back up support of recorded lectures



Resonance[®]
 Educating for better tomorrow

JEE (ADVANCED) 2022
 RESULT

RESONites ने फिर लहराया सफलता का परचम

STUDENTS FROM CLASSROOM PROGRAM (OFFLINE/ ONLINE)

AIR

6

KARTHIKEYA
 POLISETTY
 Roll No.: 21925115



AIR-1
 GEN-EWS

AIR

8

DHEERAJ
 KURUKUNDA
 Roll No.: 21920114



Students
 in TOP-100
 All India
 Ranks
 (AIRs)



AIR-11
 DEVANSHI MALI
 Roll No.: 21910044



AIR-15
 ASHREET ANAND
 Roll No.: 21925115



AIR-35
 SANGHAR SHRIVYA
 Roll No.: 21925115



AIR-50
 ANUBHAV DARD
 Roll No.: 21220102



AIR-54
 SAKSHITA S. NAVIK
 Roll No.: 21220664



AIR-58
 KARISHK SHARMA
 Roll No.: 21220484

ADMISSIONS OPEN FOR ACADEMIC SESSION 2023-24

TARGET: JEE (Adv.) 2024

for Class XII Passed Student

VISHESH COURSE

TARGET: JEE (Main) 2024

for Class XII Passed Student

ABHYAAS COURSE

MODE: OFFLINE / ONLINE CLASS STARTS 10th & 17th April

MODE: OFFLINE / ONLINE CLASS STARTS 10th & 24th April

SCHOLARSHIP ON THE BASIS OF JEE (MAIN) 2023 %ILE / AIR

Resonance Eduventures Limited
REGISTERED & CORPORATE OFFICE: CG Tower, A-46 & 52, IPHA, Near City Mall, Jhalawar Road, Kota (Rajasthan) - 324005
Tel. No.: 0744-2777777, 2777700 | CIN: U80302RJ2007PLC024029

Social Media Connect

Facebook.com/ResonanceEdu | @300741444 | youtube.com/@ResonanceEdu | Line:OfficialResonance
Instagram.com/resonance.edu | in:institute.on/school/resonance-eduventures-raj/ | twitter.com/ResonanceEdu