JEE MAIN April'19

PAPER WITH SOLUTION

12 April 2019 _ Morning _ Chemistry

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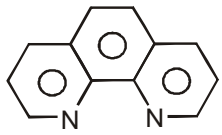
1. The complex ion that will lose its crystal field stablization energy upon oxidation of its metal to +3 state is :

(Phen=



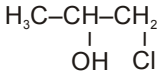
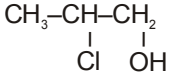
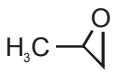
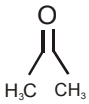
and
ignore pairing energy)

(1) $[Zn(phen)_3]^{2+}$ (2) $[Fe(phen)_3]|^{2+}$ (3) $[Ni(phen)_3]^{2+}$ (4) $[Co(phen)_3]^{2+}$

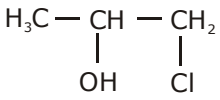
Sol. **2**

This is the test of fe^{2+} ion

2. The major product of the following addition reaction is $H_3C-CH=CH_2 \xrightarrow{Cl_2/H_2O}$

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

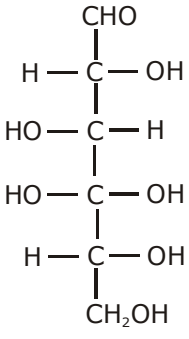
Sol. **1**

$H_3C-CH=CH_2 \xrightarrow{Cl_2/H_2O}$ 

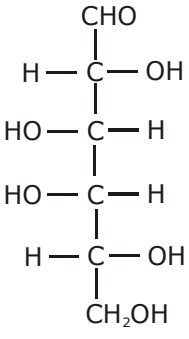
3. Glucose and Galactose are having identical configuration in all the positions except position.

(1) C – 5 (2) C – 2 (3) C – 3 (4) C – 4

Sol. **4**

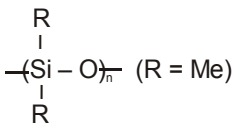


Glucose



Galactose

4. The basic structural unit of feldspar, zeolities, mica, and asbestos is :

(1) SiO_2 (2) 

(3) $(SiO_4)^{4-}$ (4) $(SiO_3)^{2-}$

Sol. **3**

Conceptual

Fee ₹ 1500

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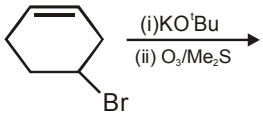
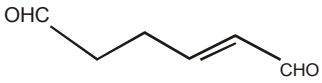
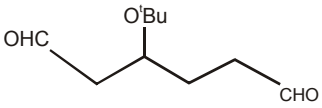
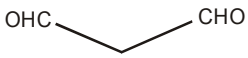
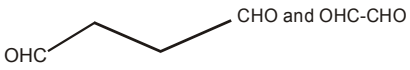
5. The major product (s) obtained in the following reaction is/are :



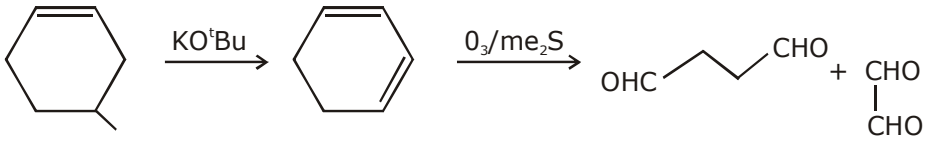
(1) 

(2) 

(3) 

(4) 

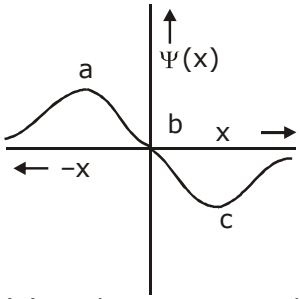
Sol. **4**



6. Peptization is a :
(1) Process of converting a colloidal solution into precipitate
(2) Process of converting precipitate into colloidal solution
(3) Process of converting soluble particles to form colloidal solution
(4) Process of bringing colloidal molecule into solution

Sol. **2**
Conceptual

7. The electrons are more likely to be found :



(1) In the region a and b
(2) Only in the region a
(3) in the region a and c
(4) only in the region c

Sol. **3**

8. The correct set of species responsible for the photochemical smog is :
(1) CO_2, NO_2, SO_2 and hydrocarbons
(2) N_2, NO_2, and hydrocarbons
(3) NO, NO_2, O_3, and hydrocarbons
(4) N_2, O_2, O_3, and hydrocarbons

Sol. **3**
photochemical smog is caused by oxides of nitrogen and ozone and hydrocarbons

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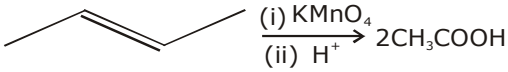
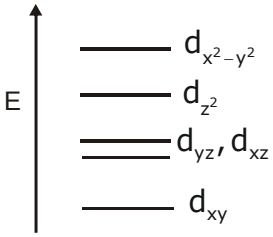
9. But-2-ene on reaction with alkaline $KMno_4$ at elevated temperature followed by acidification will give :
(1) one molecule of CH_3CHO and one molecule of CH_3COOH
(2) $CH_3–\underset{\underset{OH}{|}}{CH}–\underset{\underset{OH}{|}}{CH}–CH_3$
(3) 2 molecules of CH_3CHO
(4) 2 molecules of CH_3COOH

Sol. **4**



10. Complete removal of both the axial ligands (along the z-axis) from an octahedral complex leads to which of the following splitting patterns ? (relative orbital energies not on scale).

(1)


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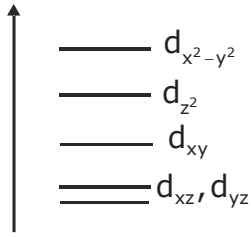

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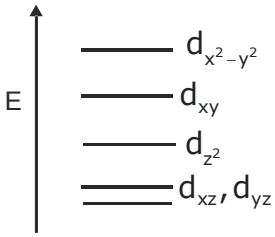

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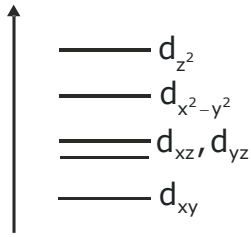
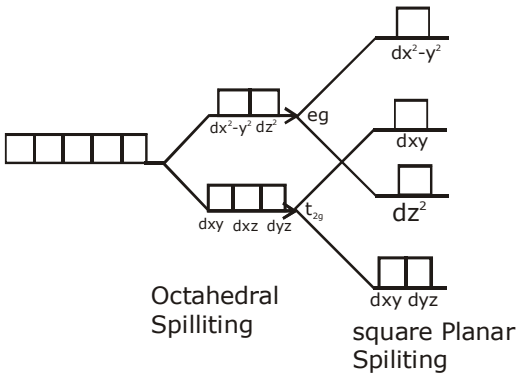


Sol. **3**



11. The metal that gives hydrogen gas upon treatment with both acid as well as base is:
(1) magnesium (2) zinc (3) iron (4) mercury

Sol. **2**
$Zn + 2HCl \rightarrow ZnCl_2 + H_2\uparrow$
$Zn + 2NaOH \rightarrow Na_2ZnO_2 + H_2\uparrow$

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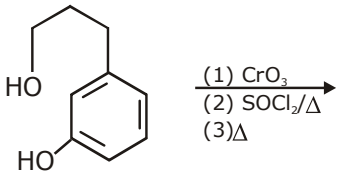
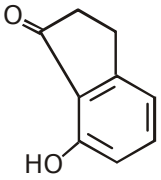
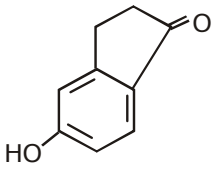
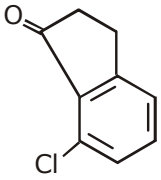
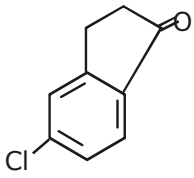
12. The major product of the following reaction is:



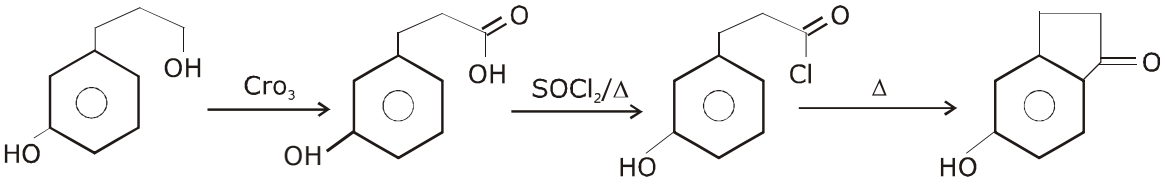
(1) 

(2) 

(3) 

(4) 

Sol. **2**



13. An organic compound 'A' is oxidized with Na_2O_2 followed by boiling with HNO_3. The resultant solutin is then treated with ammonium molybdate to yield a yellow precipitate.
Based on above observation, the element present in the given compound is:
(1) Fluorine (2) Phosphorus (3) Sulphur (4) Nitrogen

Sol. **3**
This is the test of element phosphorus.

14. What is the molar solubility of $Al(OH)_3$ in 0.2 M NaOH solution? Given that, solubility product of $Al(OH)_3 = 2.4 \times 10^{-24}$:
(1) 3×10^{-19} (2) 12×10^{-21} (3) 12×10^{-23} (4) 3×10^{-22}

Sol. **4**
$K_{sp} = [Al^{+3}]\,[OH^-]^3$
$2.4 \times 10^{-24} = [Al^{+3}]\,(0.2)^3$

$$\frac{2.4\times10^{-24}}{8\times10^{-3}} = [Al^{+3}] = 3 \times 10^{-22}$$

15. Given:
$Co^{3+} + e^- \rightarrow Co^{2+}$; $E° = +1.81V$
$Pb^{4+} + 2e^- \rightarrow Pb^{2+}$; $E° = +1.67V$
$Ce^{4+} + e^- \rightarrow Ce^{3+}$; $E° = +1.61V$
$Bi^{3+} + 3e^- \rightarrow Bi$; $E° = +0.20V$
Oxidizing power of the species will increase in the order:
(1) $Co^{3+} < Ce^{4+} < Bi^{3+} < Pb^{4+}$ (2) $Bi^{3+} < Ce^{4+} < Pb^{4+} < Co^{3+}$
(3) $Co^{3+} < Pb^{4+} < Ce^{4+} < Bi^{3+}$ (4) $Ce^{4+} < Pb^{4+} < Bi^{3+} < Co^{3+}$

Sol. **2**

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16. The group number, number of valence electrons and valency of an element with atomic number 15, respectively, are:
(1) 15, 6 and 2 (2) 16, 5 and 2 (3) 15, 5 and 3 (4) 16, 6 and 3

Sol. **3**
Group no = 15 no of valance of electron = 5
valency of element = 3

17. The correct sequence of thermal stability of the following carbonates is:
(1) $MgCO_3 < SrCO_3 < CaCO_3 < BaCO_3$ (2) $BaCO_3 < SrCO_3 < CaCO_3 < MgCO_3$
(3) $MgCO_3 < CaCO_3 < SrCO_3 < BaCO_3$ (4) $BaCO_3 < CaCO_3 < SrCO_3 < MgCO_3$

Sol. **3**
Thermal stability of carbonate
$mgCO_3 < CaCO_3 < SrCO_3 < BaCO_3$

18. In the following reaction; $xA \rightarrow yB$

$$\log_{10}\left[-\frac{d[A]}{dt}\right] = \log_{10}\left[\frac{d[B]}{dt}\right] + 0.3010$$

'A' and 'B' respectively can be:
(1) N_2O_4 and NO_2 (2) C_2H_2 and C_6H_6
(3) n-Butane and Iso-butane (4) C_2H_4 and C_4H_8

Sol. **4**

$$\text{Log}\left(-\frac{dA}{dt}\right) = \log\left[2 \times \frac{dB}{dt}\right] = \frac{-dA}{dt} = \frac{2dB}{dt}$$

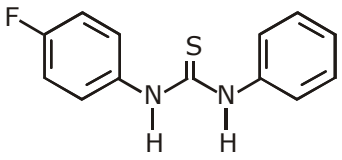
Rx^n will be
$2A \rightarrow B$ $2C_2H_4 \rightarrow C_4H_8$

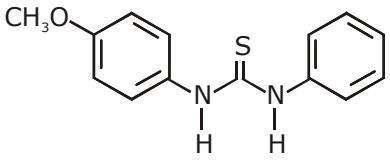
19. The mole fraction of a solvent in aqueous soltion of a solute is 0.8. The molality (in mol kg^{-1}) of the aqueous solution is:
(1) 13.88×10^{-3} (2) 13.88×10^{-1} (3) 13.88 (4) 13.88×10^{-2}

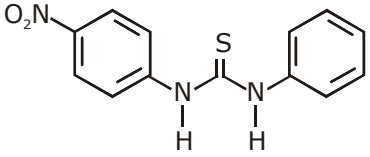
Sol. **3**

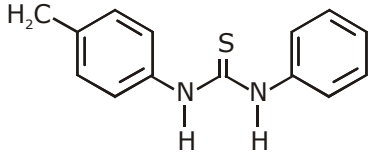
$$m = \frac{X_A}{X_B} \times \frac{1000}{M_B} = \frac{0.2}{2.8} \times \frac{1000}{18} \qquad m = 13.88$$

20. The increasing order of the pK_b of the following compound is:

(A) 

(B) 

(C) 

(D) 

(1) (A) < (C) < (D) < (B) (2) (C) < (A) < (D) < (B)
(3) (B) < (D) < (A) < (C) (4) (B) < (D) < (C) < (A)

Sol. **3**
As P_{kb} increase basic strength decrease.

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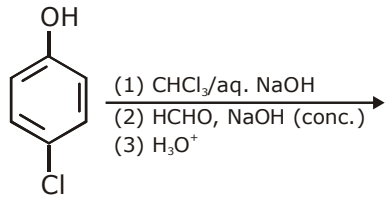
21. 5 moles of AB_2 weigh 125×10^{-3} kg and 10 moles of A_2B_2 weight 300×10^{-3}kg. The molar mass of A(M_A) and molar mass of B(M_B) in kg mol^{-1} are:

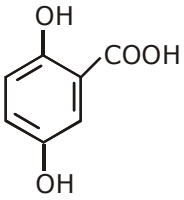
(1) $M_A = 5 \times 10^{-3}$ and $M_B = 10 \times 10^{-3}$ (2) $M_A = 50 \times 10^{-3}$ and $M_B = 25 \times 10^{-3}$

(3) $M_A = 25 \times 10^{-3}$ and $M_B = 50 \times 10^{-3}$ (4) $M_A = 10 \times 10^{-3}$ and $M_B = 5 \times 10^{-3}$

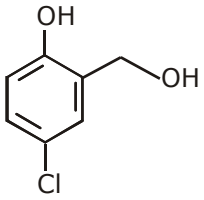
Sol. **1**

22. The major products of the following reaction are:

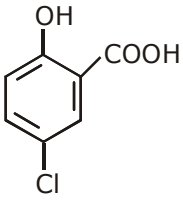


(1) 

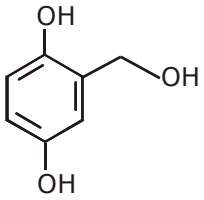
and Methanol

(2) 

and Formic acid

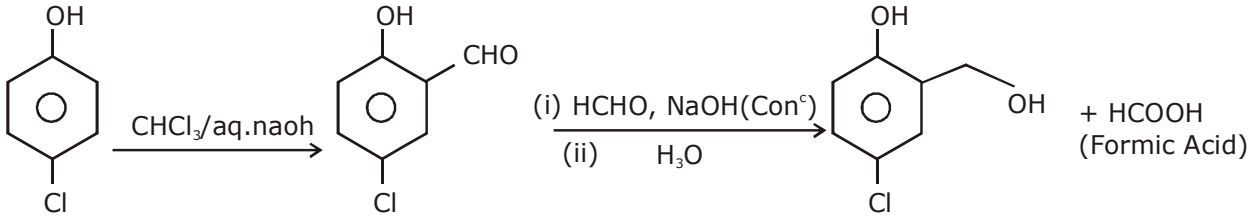
(3) 

and Methanol

(4) 

and Formic acid

Sol. **2**



23. An ideal gas is allowed to expand from 1L to 10L against a constant external pressure of 1 bar. The work done in kJ is:

(1) –0.9 (2) +10.0 (3) –2.0 (4) –9.0

Sol. **1**

$w = -p_{ext} \Delta v = -1$ bar [9 lit] = –900J = –0.9kJ

24. An element has a face-centred cubic (fcc) structure with a cell edge of a. The distance between the centres of two nearest tetrahedral voids in the lattice is:

(1) $\frac{a}{2}$ (2) $\sqrt{2}a$ (3) $\frac{3}{2}a$ (4) a

Sol. **1**

Fact

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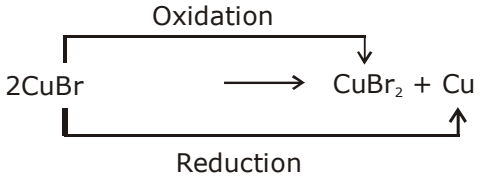
25. The idea of froth floatation method came from a person X and this method is related to the process Y of ores. X and Y, respectively are:
(1) washer man and reduction (2) fisher woman and concentration
(3) fisher man and reduction (4) washer woman and concentration

Sol. **4**
Conceptual

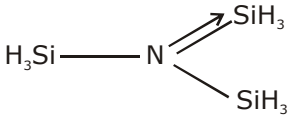
26. An exmaple of a disproportionation reaction is:
(1) $2MnO_4^- + 10I^- + 16H^+ \rightarrow 2M^{2+} + 5I_2 + 8H_2O$
(2) $2CuBr \rightarrow CuBr_2 + Cu$
(3) $2NaBr + Cl_2 \rightarrow 2NaCl + Br_2$
(4) $2KMnO_4 \rightarrow K_2MnO_4 + MnO_2 + O_2$

Sol. **2**

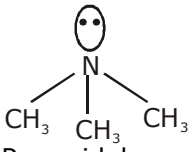


27. The correct statement among the following is:
(1) $(SiH_3)_3N$ is planar and less basic than $(CH_3)_3N$
(2) $(SiH_3)_3N$ is planar and more basic than $(CH_3)_3N$
(3) $(SiH_3)_3N$ is pyramidal and more basic than $(CH_3)_3N$
(4) $(SiH_3)_3N$ is pyramidal and less basicthan $(CH_3)_3N$

Sol. **1**



Planar



Pyramidal

28. Which of the following is a thermosetting polymer?
(1) Buna-N (2) Nylon 6 (3) PVC (4) Bakelite

Sol. **4**
Conceptual

29. Which of the following statements is not true about RNA?
(1) It has always doulbe stranded α-helix structure
(2) It usually does not replicate
(3) It is present in the nucleus of the cell
(4) It controls the synthesis of protein

Sol. **1**
Conceptual

30. Enthalpy of sublimation of iodine is 24 cal g^{-1} at 200°C. If specific heat of $I_2(s)$ and I_2 (vap) are 0.055 and 0.031 cal $g^{-1}K^{-1}$ respectively, then enthalpy of sublimation of iodine at 250°C in cal g^{-1} is
(1) 11.4 (2) 22.8 (3) 2.85 (4) 5.7

Sol. **2**

$$\frac{\Delta H_{T2} - 24}{50} = \frac{(31-55)}{1000} \times 254$$

$$\Delta H_{i2} - 24 = -24 \times \frac{254}{20} = 22.8$$

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मोशन ने बनाया साधारण को असाधारण

JEE Main Result Jan'19

4 RESIDENTIAL COACHING PROGRAM (DRONA) STUDENTS ABOVE 99.9 PERCENTILE

Total Students Above 99.9 percentile - **17**

Total Students Above 99 percentile - **282**

Total Students Above 95 percentile - **983**

% of Students Above 95 percentile $\frac{983}{3538} = 27.78\%$

Scholarship on the Basis of 12th Class Result

Marks PCM or PCB	Hindi State Board	State Eng OR CBSE
70%-74%	30%	20%
75%-79%	35%	25%
80%-84%	40%	35%
85%-87%	50%	40%
88%-90%	60%	55%
91%-92%	70%	65%
93%-94%	80%	75%
95% & Above	90%	85%

New Batches for Class 11th to 12th pass
17 April 2019 & 01 May 2019

हिन्दी माध्यम के लिए पृथक बैच

Scholarship on the Basis of JEE Main Percentile

Score	JEE Mains Percentile	English Medium Scholarship	Hindi Medium Scholarship
225 Above	Above 99	Drona Free (Limited Seats)	
190 to 224	Above 97.5 To 99	100%	100%
180 to 190	Aboev 97 To 97.5	90%	90%
170 to 179	Above 96.5 To 97	80%	80%
160 to 169	Above 96 To 96.5	60%	60%
140 to 159	Above 95.5 To 96	55%	55%
74 to 139	Above 95 To 95.5	50%	50%
66 to 73	Above 93 To 95	40%	40%
50 to 65	Above 90 To 93	30%	35%
35 to 49	Above 85 To 90	25%	30%
20 to 34	Above 80 To 85	20%	25%
15 to 19	75 To 80	10%	15%

सैन्य कर्मियों के बच्चो के लिए 50% छात्रवृत्ति

प्री-मेडिकल में छात्राओं को 50% छात्रवृत्ति