Resonance®
Educating for better tomorrow

**CODE-C** **SUBJECT : PHYSICS & CHEMISTRY**

# WEST BENGAL JOINT ENTRANCE EXAMINATION (WBJEE) 2019

**Date: 26 May, 2019 | Duration: 2 Hours | Max. Marks: 100**

## :: IMPORTANT INSTRUCTIONS ::

1. This question paper contains all objective questions divided into three categories. Each question has four answer options given.
2. **Category-I :** Carry 1 marks each and only one option is correct. In case of incorrect answer or any combination of more than one answer, ¼ marks will be deducted.
3. **Category-II :** Carry 2 marks each and only one option is correct. In case of incorrect answer or any combination of more than one answer, ½ marks will be deducted.
4. **Category-III :** Carry 2 marks each and one or more option(s) is/are correct. If all correct answers are not marked and also no incorrect answer is marked then score = 2 × number of correct answers marked ÷ actual number of correct answers. If any wrong option is marked or if any combination including a wrong option is marked, the answer will considered wrong but there is no negative marking for the same and zero marks will be awarded.
5. Questions must be answered on, OMR sheet by darkening the appropriate bubble marked (A), (B), (C) or (D).
6. Use only Black/Blue ball point pen to mark the answer by complete filing up of the respective bubbles.
7. Mark the answers only in the space provided. Do not make any stray mark on the OMR.
8. Write question booklet number and your roll number carefully in the specified locations of the OMR. Also fill appropriate bubbles.
9. Write your name (in block letter), name of the examination centre and put you full signature in appropriate boxes in the OMR.
10. The OMRs will be processed by electronic means. Hence it is liable to become invalid if there is any mistake in the question booklet number or roll number entered or if there is any mistake in filling corresponding bubbles. Also it may become invalid if there is any discrepancy in the name of the candidate, name of the examination center or signature of the candidate vis-à-vis what is given in the candidate's admit card. The OMR may also become invalid due to folding or putting stray marks on it or any damage to it. The consequence of such invalidation due to incorrect marking or careless handling by the candidate will be sole responsibility of candidate.
11. Candidates are not allowed to carry any written or printed material, calculator, pen, docu-pen, log table, wristwatch, any communication device like mobile phones etc. inside the examination hall. Any candidate found with such items will reported against & his/her candidature will be summarily cancelled.
12. Rough work must be done on the question paper itself. Additional blank pages are given in the question paper for rough work.
13. Hand over the OMR to the invigilator before leaving the Examination Hall.
14. This paper contains questions in both English and Bengali. Necessary care and precaution were taken while framing the Bengali version. However if any discrepancy(ies) is/are found between the two versions, the information provided in the English version will stand and will be treated as final.

**Resonance®**
**Educating for better tomorrow**

**Success at JEE Main 2019**

# HIGHEST number of CLASSROOM Students Qualified for JEE (Advanced) 2019 from any Institute of India*

## 12465*
(All are from Regular Classroom Program)

**with 8 classroom students in top 100 in JEE Main 2019**

**AIR-52**
Kanishk Singhal
Classroom student since class 8th
Reso Roll No.: 14401438

**AIR-100**
Ananjan Nandi
Classroom student since class 11th
Reso Roll No.: 17174485

**AIR-77**
Anubhav Kalyani
Classroom student since class 11th
Reso Roll No.: 17170028

**AIR-96**
Suhas Jain
Classroom student since class 8th
Reso Roll No.: 14400705

*Based on the information collected from public domain till 7th May 2019

**AIR-82**
Saptarshi Dasgupta
Classroom student since class 11th
Reso Roll No.: 17107807

**AIR-30**
Rajdeep Paul
Classroom student since class 11th
Reso Roll No.: 17173061

**AIR-45**
Atreya Goswami
Classroom student since class 11th
Reso Roll No.: 17172591

**AIR-12**
SHUBHANKAR GAMBHIR
Classroom student since class 10th
Reso Roll No.: 16405194

Top Category Ranks in JEE Main 2019

**AIR-2, 4, 7 (ST)**
Atin Bainada, Raja, Kuldeep Meena

**AIR-11 (SC)**
Anshul Navphule

Students qualified for JEE Advanced 2019

**8235**
students from Repeaters' Batches

**4230**
students from Freshers' Batches

**HIGHEST CLASSROOM GIRLS**
Student Qualified for JEE (Advanced) 2019 from any Institute of India*
**1506**

**HIGHEST CLASSROOM HINDI MEDIUM**
Students Qualified for JEE (Advanced) 2019 from any Institute of India*
**1450**

*All the above students are from Classroom Contact Program*

**For scholarship on the basis of JEE Main 2019, SMS RESO SCHO at 56677**

**ADMISSIONS OPEN FOR 2019-20**

Classes: V to XII & XII+
Target: JEE (Main+Advanced)
JEE (Main) | AIIMS/ NEET
Pre-foundation | Commerce & CLAT

**ResoNET Dates**
**9th & 16th June 2019**

**COURSE: VIJAY (JR)**
**FOR CLASS: XIII**
Target: JEE (Main+Advanced) 2020
Course Starts from
**10th JUNE 2019**

**Resonance Eduventures Limited**
Registered & Corporate Office: CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Rajasthan) - 324005
Tel. No.: 0744-2777777, 2777700 | CIN: U80302RJ2007PLC024029

Toll Free:
**1800 258 5555**
website: www.resonance.ac.in

# CHEMISTRY

**Category - I (Q.41 to Q.70)**

**Carry 1 mark each and only one option is correct. In case of incorrect answer or nay combination of more than one answer, ¼ mark will be deducted.**

**41.** The H–N–H angle in ammonia is 107.6º, while the H–P–H angle in phosphine is 93.5º. Relative to phosphine, the p-character of the lone pair on ammonia is expected to be

(A) Less (B) More (C) Same (D) Cannot be predicted

**Ans.** **(A)**

**Sol.** s-character increases, Bond angle increases

p-character increases, Bond angel decreases

Hence, p-character order : $PH_3 > :NH_3$

Bond angle order $PH_3 < :NH_3$

**42.** The reactive species in chlorine bleach is

(A) $Cl_2O$ (B) $OCl^-$ (C) $ClO_2$ (D) HCl

**Ans.** **(B)**

**Sol.** Chlorine bleach is $CaOCl_2$

its composition is $Ca^{2+}$, $Cl^-$, $OCl^-$

**43.** The conductivity measurement of a coordination compound of Cobalt (III) shows that it dissociates into 3 ions in solution. The compound is

(A) Hexaamminecobalt(III) chloride

(B) Pentaamminesulphatochbalt(III) chloride

(C) Pentaamminechloridochbalt(III) sulphate

(D) Pentaamminechloridochbalt(III) chloride

**Ans.** **(D)**

**Sol.** Pentaammine chloride cobalt (III) chloride

$[Co(NH_3)_5Cl]Cl_2 \rightleftharpoons [Co(NH_3)_5Cl^-]^{+2} + 2Cl^-$

Gives 3 ions in aqueous solution

**44.** In the Bayer's process, the leaching of alumina is done by using

(A) $Na_2CO_3$ (B) NaOH (C) $SiO_2$ (D) CaO

**Ans.** **(B)**

**Sol.** Bayer's process : Used for leaching of red bauxite :

$$Al_2O_3.2H_2O + 2NaOH \xrightarrow[8\ atm]{190°C} \underset{(Soluble)}{2NaAlO_2} + 3H_2O$$

$NaAlO_2 + H_2O \longrightarrow NaOH + Al(OH)_3\downarrow$

$2Al(OH)_3 \longrightarrow Al_2O_3 + 3H_2O$

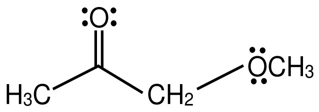
**45.** Which atomic species cannot be used as a nuclear fuel ?

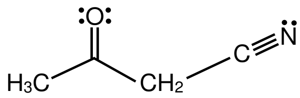
(A) ${}^{233}_{92}U$ (B) ${}^{235}_{92}U$ (C) ${}^{239}_{94}U$ (D) ${}^{238}_{92}U$

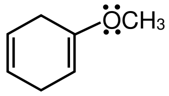
**Ans.** **(D)**

**Sol.** ${}_{92}U^{238}$ isotope of uranimum not participate in nuclear chain reaction.

**46.** The molecule/molecules that has/have delocalised lone pair(s) of electrons is/are

(I) 

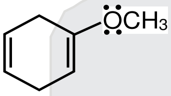
(II) 

(III) 

(IV) $CH_3CH=CHCH_2\ddot{N}HCH_3$

(A) I, II and III (B) I, II and IV (C) I and III (D) only III

**Ans.** **(D)**

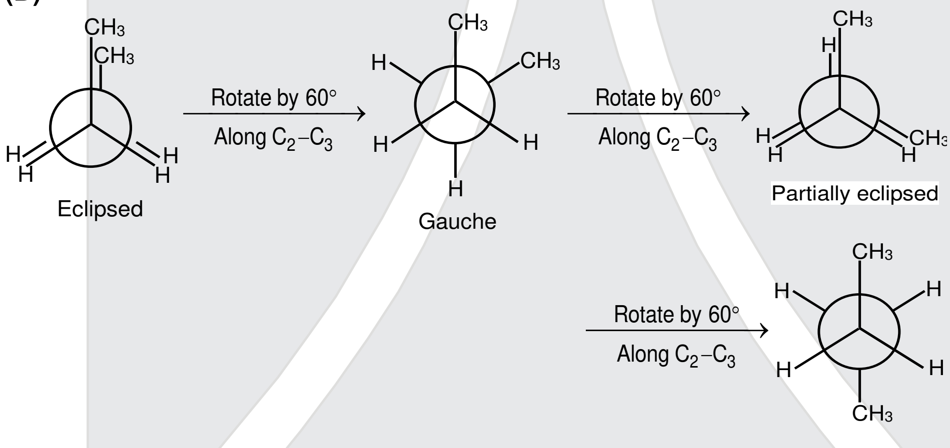
**Sol.** In  , the lone pair of oxygen get delocalised on the $\pi$ bond located on the next carbon.

**47.** The conformations of n-butane, commonly known as eclipsed, gauche and anti-conformations can be interconverted by

(A) rotation around C-H bond of a methyl group (B) rotation around C-H bond of a methylene group
(C) rotation around C1-C2 linkage (D) rotation around C2-C3 linkage

**Ans.** **(D)**

**Sol.**



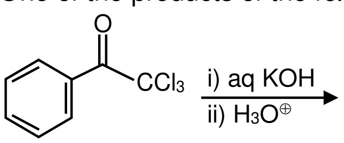

**48.** The correct order of the addition reaction rates of halogen acids with ethylene is

(A) hydrogen chloride > hydrogen bromide > hydrogen iodide
(B) hydrogen iodide > hydrogen bromide > hydrogen chloride
(C) hydrogen bromide > hydrogen chloride > hydrogen iodide
(D) hydrogen iodide > hydrogen chloride > hydrogen bromide

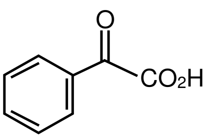
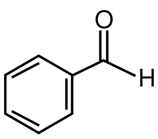
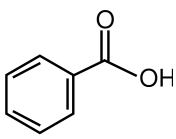
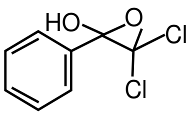
**Ans.** **(B)**

**Sol.** Hydrogen iodide > hydrogen bromide > hydrogen chloride

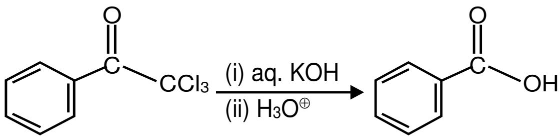
**49.** One of the products of the following reactions **P.**



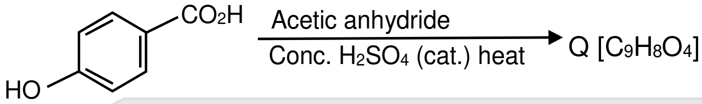

Structure of **P** is

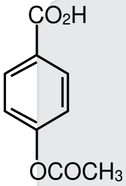
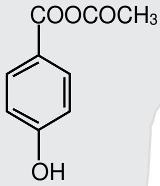
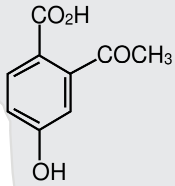
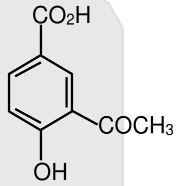
(A)  (B)  (C)  (D) 

**Ans.** **(C)**

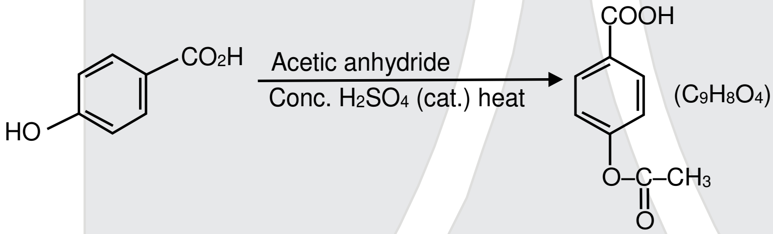
**Sol.** 

**50.** For the reaction below, the product is **Q.**



(A)  (B)  (C)  (D) 

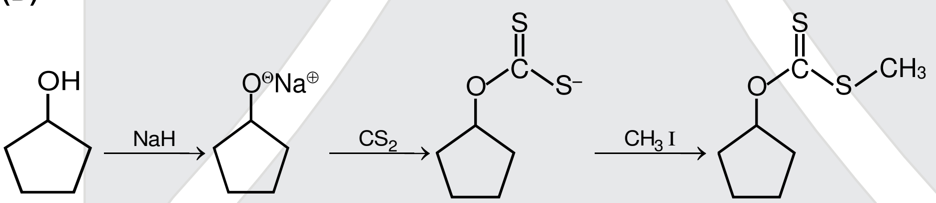
**Ans.** **(A)**

**Sol.** 

**51.** Cyclopentanol on reaction with NaH followed by $CS_2$ and $CH_3I$ produces a/an

(A) ketone (B) alkene (C) ether (D) xanthate

**Ans.** **(D)**

**Sol.** 

Methyl cyclopentylxanthate

**52.** The compound, which evolves carbon dioxide on treatment with aqueous solution of sodium bicarbonate 25ºC, is

(A) $C_6H_5OH$ (B) $CH_3COCl$ (C) $CH_3CONH_2$ (D) $CH_3COOC_2H_5$

**Ans.** **(B)**

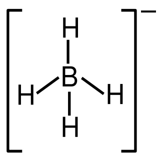
**Sol.** This question has not a direct answer. In aqueous $NaHCO_3$ solution some amount of $OH^-$ is present, which hydrolyse the $CH_3COCl$ to $CH_3COOH$. The $CH_3COOH$ thus formed gives out $CO_2$ gas with sodium bicarbonate.

**Note:** Only Nitro-phenols gives out $CO_2$ with $NaHCO_3$, Not the phenol.

**53.** The indicated atom is not a nucleophilic site in

(A) $\underset{\uparrow}{B}H_4^-$ (B) $\underset{\uparrow}{C}H_3MgI$ (C) $CH_3\underset{\uparrow}{O}H$ (D) $CH_3\underset{\uparrow}{N}H_2$

**Ans.** **(A)**

**Sol.** In $BH_4^-$, "B" is not nucleophilic site 

**54.** The charge carried by 1 millimole of $M^{n+}$ ions is 193 coulombs. The value of n is
(A) 1 (B) 2 (C) 3 (D) 4

**Ans.** **(B)**

**Sol.** Charge on 1 milimole $M^{n+}$ ions = 193 cb = $\frac{n \times 96500}{1000}$

$$n = \frac{193 \times 1000}{96500} = 2$$

**55.** Which of the following mixtures will have the lowest pH at 298 K ?
(A) 10 ml 0.05N$CH_3COOH$ + 5 ml 0.1 N$NH_4OH$
(B) 5 ml 0.2$NH_4Cl$ + 5 ml 0.2 N $NH_4OH$
(C) 5 ml 0.1N $CH_3COOH$ + 10 ml 0.05 N $CH_3COONa$
(D) 5 ml 0.1N $CH_3COOH$ + 5 ml 0.1 N NaOH

**Ans.** **(C)**

**Sol.** (C) $CH_3COOH$ + $CH_3COONa$
0.1N 5ml 0.05 N, 10ml
mili eq. (0.5) (0.5)

It is acidic buffer solution pH = pKa + log $\frac{CH_3COO^-}{CH_3COOH}$

(pH = pKa) only
this solution will have lowest pH,

(A) $CH_3COOH + NH_4OH \longrightarrow CH_3COONH_4$
0.05 N 0.1 N ↓
10 ml 5 ml (WAWB Salt)
(0.5) (0.5) [Ph=7 –1/2 pKb + 1/2 pKa] ≈ 7 [pKa = pKb]

(B) ($NH_4Cl + NH_4OH$) Basic buffer solution

$$POH = pKb + \log\left(\frac{CA}{B}\right)$$

PH > 7

(D) $CH_3COOH + NaOH \longrightarrow CH_3COONa$
(WASB Salt)
(Ph = 7 + 1/2 PKb = 1/2 log C)
PH > 7

**56.** Consider the following two first order reactions occurring at 298 K with same initial concentration of A :
(1) $A \rightarrow B$ : rate constant, k = 0.693 $min^{-1}$
(2) $A \rightarrow C$ : half – life, $t_{1/2}$ = 0.693 $min^{-1}$
Choose the correct option :
(A) Reaction (1) is faster than Reaction (2).
(B) Reaction (1) is slower than Reaction (2).
(C) Both reaction proceed at the same rate.
(D) Since two different products are formed, rates cannot be compared.

**Ans.** **(B)**

**Sol.** For $I^H$ order Reaction ; Rate constant K = $\frac{0.693}{ty_2}$ and Rate = K $(A)^1$

For (I) Reaction = K = 0.693 $mint^{-1}$

For (II) Reaction = K = $\frac{0.693}{ty_2} = \frac{0.693}{0.693}$ = 1 $Mint^{-1}$

So, $K_I < K_{II}$
than Rate (I) < Rate (II)

**57.** For the equilibrium $H_2O(\ell) \rightleftharpoons H_2O(v)$, which of the following is correct ?

(A) $\Delta G = 0, \Delta H < 0, \Delta S < 0$
(B) $\Delta G < 0, \Delta H > 0, \Delta S > 0$
(C) $\Delta G > 0, \Delta H = 0, \Delta S > 0$
(D) $\Delta G = 0, \Delta H > 0, \Delta S > 0$

**Ans.** **(D)**

**Sol.** For equilibrium $H_2O\ (l) \rightleftharpoons H_2O_{(g)}$

$\Delta$ G = 0,
$\Delta$ H > 0 (+ive) endothermic
$\Delta$ S > 0 (+ ive)

$$\Delta S\ sys = (nC_v ln \frac{T_2}{T_1}) + nR ln \frac{V_2}{V_1}$$

0

$$\Delta S\ sys = n\ R ln \frac{V_2}{V_1} \text{ at constant temperature}$$

**58.** For a vander Waal's gas, the term $\left(\frac{ab}{v^2}\right)$ represents some

(A) Pressure (B) Energy (C) Critical density (D) Molar mass

**Ans.** **(B)**

**Sol.** Term $\frac{ab}{v^2}$ represent energy permole of gases.

Unit of a (Vander wal's constant) = $\frac{atm.liter^2}{mole^2}$

Unit of b (Vander wals's constant) = $\frac{liter}{mole}$

V = volume of gas per mole = $\frac{liter}{mole}$

$$\text{So } \frac{ab}{v^2} \text{ (Unit)} = \frac{\frac{atm.liter^2}{mole^2} \times \frac{liter}{mole}}{\left(\frac{liter}{mole}\right)^2} = \left(\frac{atm.liter}{mole}\right)$$

It is unit of energy per mole.

**59.** In the equilibrium $H_2 + I_2 \rightleftharpoons 2HI$, if at a given temperature the concentrations of the reactants are increased, the value of the equilibrium constant, $K_C$, will

(A) Increase
(B) Decrease
(C) Remain the same
(D) Cannot be predicted with certainty

**Ans.** **(C)**

**Sol.** Equilibrium constant not depend on concentration of reactant it is depended only on temperature

**60.** If electrolysis of aqueous $CuSO_4$ solution is carried out using Cu-electrodes, the reaction taking place at the anode is

(A) $H^+ + e \rightarrow H$
(B) $Cu^{2+}\ (aq) + 2e \rightarrow Cu(s)$
(C) $SO_4^{2-}\ (aq) - 2e \rightarrow SO_4$
(D) $Cu(s) - 2e \rightarrow Cu^{2+}\ (aq)$

**Ans.** **(D)**

**Sol.** On electrolysis of aqueous solution of $CuSO_4$ on using Cu-electrode. According to SOP values at anode.

$2H_2O \rightarrow O_2 + 4H^+ + 4e^-$ $E^0 = -1.2.3$ V
$Cu \rightarrow Cu^{+2} + 2e^-$ $E^0 = -0.34$ V

So reaction carried out on anode, which have high SOP value.

**61.** Which one of the following electronic arrangements is absurd?

(A) $n = 3, \ell = 1, m = -1$ (B) $n = 3, \ell = 0, m = 0$

(C) $n = 2, \ell = 0, m = -1$ (D) $n = 2, \ell = 1, m = 0$

**Ans.** **(C)**

**Sol.** Quantum number set n = 2, l = 0, m = –1 it is not possible (not valid). (Value of $m \leq +l$ to $-l$]

**62.** The quantity $h\nu/k_B$ corresponds to

(A) Wavelength (B) Velocity (C) Temperature (D) Angular momentum

**Ans.** **(C)**

**Sol.** $K_{\in} = \frac{3}{2}K_BT = h\nu$ (For photon)

(Partial form = wave form)

$\frac{h\nu}{k_B} = \frac{3}{2}T$ (it represent temperature)

**63.** In the crystalline solid $MSO_4.\ nH_2O$ of molar mass 250 g $mol^{-1}$, the percentage of anhydrous salt is 64 by weight. The value of n is

(A) 2 (B) 3 (C) 5 (D) 7

**Ans.** **(C)**

**Sol.** Mass of anhydrous $MSO_4$ salt $= 250 \times \frac{64}{100} = 160$ gm/mole

Total. Mass of $H_2O$ is $MSO_4.\ nH_2O = 250 - 160 = 90$ gm/mole

So value of $n = \frac{90}{18} = 5$

**64.** At S.T.P. the volume of 7.5 g of a gas is 5.6 L. The gas is

(A) NO (B) $N_2O$ (C) CO (D) $CO_2$

**Ans.** **(A)**

**Sol.** At S.T.P weight of 5.6 L gas = 7.5 gm

At S.T.P weight of 22.4 L gas $= \frac{7.5}{5.6} \times 22.4$

mol Mass of gas gas is (NO) = 30.0 gm/mole

**65.** The half – life period of ${}_{53}I^{125}$ is 60 days. The radioactivity after 180 days will be

(A) 25 % (B) 12.5 % (C) 33.3 % (D) 3.0 %

**Ans.** **(B)**

**Sol.** $t_{½} = 60$ days Radioactivity after t time $N_t = \frac{N_o}{(2)^n}$ and $n = \frac{t}{t_{½}}$

So, $n = \frac{180}{60} = 3$ ; $N_t = \frac{N_o}{(2)^3} = \frac{N_o}{8} = 0.125\ N_0$

So Radioactivity after 180 days = 12.5%.

**66.** Consider the radioactive disintegration

$${}_{82}A^{210} \rightarrow B \rightarrow C \rightarrow {}_{82}D^{206}$$

The sequence of emission can be

(A) $\beta, \beta, \beta$ (B) $\alpha, \alpha, \beta$ (C) $\beta, \beta, \gamma$ (D) $\beta, \beta, \alpha$

**Ans.** **(D)**

**Sol.** ${}_{82}A^{210} \xrightarrow{\beta} {}_{83}B^{210} \xrightarrow{\beta} {}_{84}C^{210} \xrightarrow{\alpha} {}_{82}C^{206}$

${}_{Z}X^{A} \longrightarrow {}_{Z+1}Y^{A} + \beta$-particle

${}_{Z}X^{A} \longrightarrow {}_{Z-2}Y^{A-4} + \alpha$-particle

**67.** The second Ionisation energy of the following elements follows the order

(A) Zn > Cd < Hg (B) Zn > Cd > Hg (C) Cd > Hg < Zn (D) Zn < Cd < Hg

**Ans.** **(A)**

**Sol.** II$^{nd}$ I.E Order : Cd < Zn < Hg

So, Zn > Cd < Hg

| Element | II$^{nd}$ I.E. (kJ/mole) |
|---|---|
| Zn | 1734 |
| Cd | 1631 |
| Hg | 1809 |

**68.** The melting points of (i) $BeCl_2$ (ii) $CaCl_2$ and (iii) $HgCl_2$ follows the order

(A) i < ii < iii (B) iii < i < ii (C) i < iii < ii (D) ii < i < iii

**Ans.** **(B)**

**Sol.** Melting point order $HgCl_2 < BeCl_2 < CaCl_2$

(iii) < (i) < (ii)

Melting points = 276°C 399°C 775°C

According to covalent character

$$\text{Melting points} \propto \frac{\mathbf{1}}{\textbf{Covalent character}}$$

**69.** Which of these species will have non-zero magnetic moment?

(A) $Na^+$ (B) Mg (C) $F^-$ (D) $Ar^+$

**Ans.** **(D)**

**Sol.**

| | | No. of unpaired $e^-$ |
|---|---|---|
| $_{11}Na^+$ | $= 1s^2\,2s^2\,2p^6$ | 0 |
| $_{12}Mg$ | $= 1s^2\,2s^2\,2p^6\,3s^2$ | 0 |
| $_9F^-$ | $= 1s^2\,2s^2\,2p^6$ | 0 |
| $_{18}Ar^+$ | $= 1s^2\,2s^2\,2p^6\,3s^2 3p^5$ | 1 |

**70.** The first electron affinity of C, N and O will be of the order

(A) C < N < O (B) N < C < O (C) C < O < N (D) O < N < C

**Ans.** **(B)**

**Sol.** I$^{st}$ electron affinity order : N < C < O

According to electronic configuration

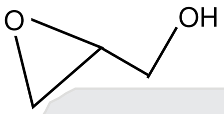
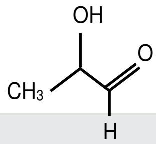
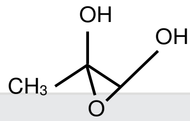
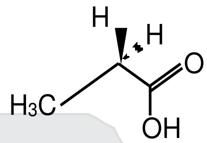
$N = 1s^2\ 2s^2\ 2p^3$ Half-filled orbital are more stable

$$\text{EA. kJ/mole}\begin{pmatrix} C = 121.77 \\ N = -6.8 \\ O = 140 \end{pmatrix}$$

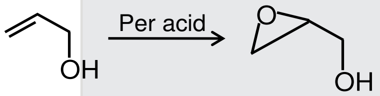
**Category-II (Q.71 to Q75)**

**Carry 2 marks each and only one option is correct. In case of incorrect answer or any combination of more than one answer, ½ mark will be deducted.**

**71.** Oxidatin of allyl alcohol with a peracid gives a compound of molecular formula $C_3H_6O_2$, Which contains an asymmetric carbon atom. The structure of the compound is

(A) 
(B) 
(C) 
(D) 

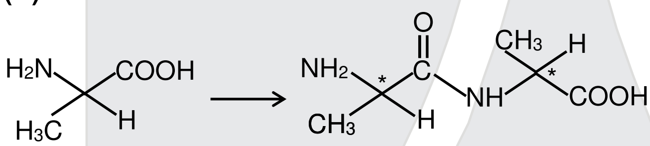
**Ans.** **(A)**

**Sol.** 


**72.** The total number of isomeric liner dipeptide which can be synthesized from racemic alanine is

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

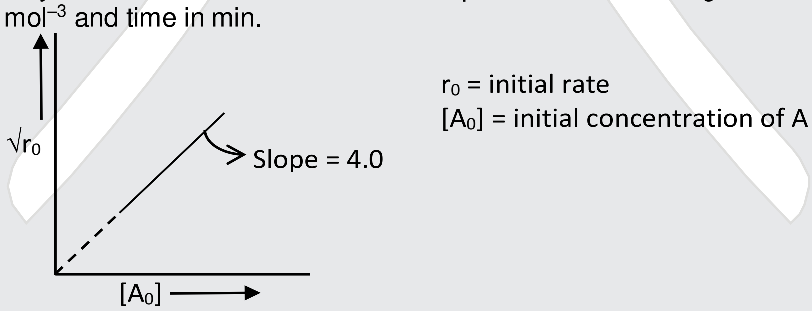
**Ans.** **(D)**

**Sol.** 

R + S

Dipeptide has two chiral carbon and both side unsymmetrical hence RR, RS, SR and SS is possible.

**73.** The kinetic study of a reaction like vA → P at 300 K provides the following curve. Where concentration is taken in mol mol$^{-3}$ and time in min.




(A) n = 0, k = 4.0mol dm$^{-3}$ min$^{-1}$.
(B) n = 1/2, k = 2.0 mol$^{1/2}$ dm$^{3/4}$dm$^{-3}$ min$^{-1}$.
(C) n = 1, k = 8.0 min$^{-1}$.
(D) n = 2, k = 16.0 dm$^3$ mol$^{-1}$ min$^{-1}$.

**Ans.** **(D)**

**Sol.** Rate = k(A)$^n$

According to graph (n = 2)

$$\text{Slope} = \frac{(\text{Rate})^{\frac{1}{2}}}{(\text{A})} = 4$$

$$k = \frac{\text{Rate}}{(\text{A})^2} = (4)^2 = 16$$

**74.** At constant pressure, the heat of formation of compound is not dependent on temperature, when

(A) $\Delta C_p = 0$  (B) $\Delta C_v = 0$  (C) $\Delta C_p > 0$  (D) $\Delta C_p < 0$

**Ans. (A)**

**Sol.** For reaction: (According to Kirchhoff's equation)

$\Delta H_2 = \Delta H_1 + \Delta C_p(\Delta T)$

When $\Delta C_p = 0$

$\Delta H_f$ is not depends on temperature.

**75.** A coper coin was electroplated with Zn and then heated at high temperature until there is a change in colour. What will be the resulting colour?

(A) White  (B) Black  (C) Silver  (D) Golden

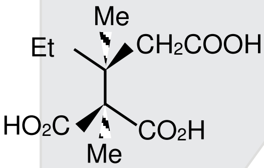
**Ans. (B)**

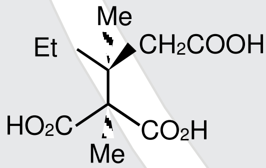
**Sol.** If these coins are heated, the zinc will diffuse into the copper layer, producing a surface alloy of zinc and copper. These alloys are brasses. Copper also oxidizes when heated in air, producing a black layer of copper-oxide (CuO).

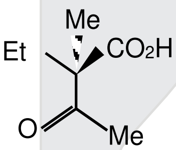
**Category-III (Q.76 to Q.80)**

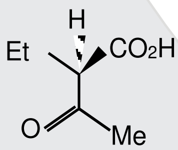
**Carry 2 marks each one or more option(s) is/are correct. If all correct answer are not marked and also no incorrect answer is marked then score = 2 × number of correct answer marked + actual number of correct answers. If any wrong option is marked or if any combination including a wrong option is marked, the answer will considered wrong, but three is no negative marking for the same and zero mark will be awarded.**

**76.** The compounds(s), capable of producing achiral compound on heating at 100ºC is/are

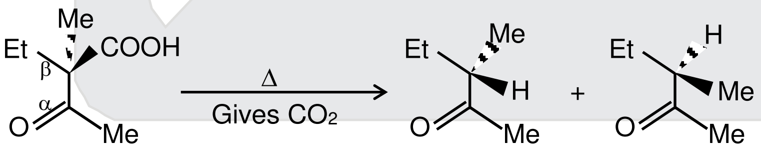
(A) 


(B) 


(C) 

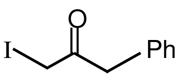

(D) 

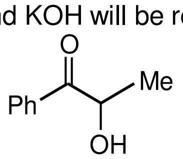

**Ans. (C)**

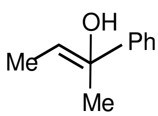
**Sol.** 

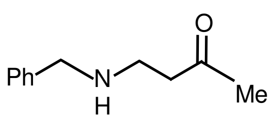

β-keto acid  Achiral mixture

**77.** Haloform reaction with $I_2$ and KOH will be responded by

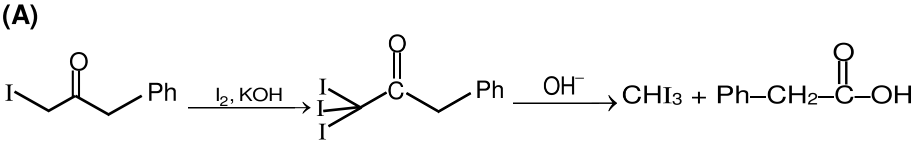
(A) 


(B) 


(C) 

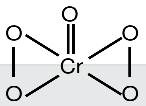

(D) 


**Ans. (A)**

**Sol.** 

**78.** Identify the correct statement(s):
(A) The oxidation number of Cr in $CrO_5$ is +6.
(B) $\Delta H > \Delta U$ for the reaction $N_2O_4(g) \rightarrow 2NO_2(g)$. Provided both gases behave idelly.
(C) pH of 0.1N $H_2SO_4$ is less than that of 0.1 N HCl at 25ºC
(D) $\left(\frac{RT}{F}\right) = 0.0591$ volt at 25ºC.

**Ans.** **(A,B)**

**Sol.** (A) O.N. of grim Cr $O_5$  = + 6

(B) $N_2O_4$ (g) $\rightarrow 2NO_2$ (g).$\Delta H = \Delta U + \Delta n_g RT$ $\Delta n_g = 2 - 1$ so $\Delta H > \Delta U$
(C) pH of 0.1 N $H_2SO_4 \Rightarrow [H^+]$ 0.1 N
pH = –log $[H^+]$ = 10 g $(10^{-1})$
pH of 0.1 N HCl = $[H^+]$ = 0.1 N
pH = log $[H^+] = -\log(10^{-1}) = (1)$
(D) $\frac{RT}{F} = \frac{8.314 \times 298}{96500} = 0.256$

$$\frac{2.303RT}{F} = \frac{2.303 \times 8.314 \times 298}{96500} = 0.0591$$

**79.** Compounds with spin-only magnetic moment equivalent to five unpaired electrons are
(A) $K_4[Mn(CN)_6]$ (B) $[Fe(H_2O)_6]Cl_3$ (C) $K_3[FeF_6]$ (D) $K_4[MnF_6]$

**Ans.** **(B,C,D)**
BCD complex shown spin only magnetic moment equivalent to 5 unpaired electrons.

**Sol.** (A) $K_4[Mn(CN)_6]$; $Mn^{+2} = 3d^5\,4S^0$ (in octahedral complex)
$CN^-$ ; SFL $t_{2g}^{221}\,eg^{00}$ (due to pairing of $e^-$)
(B) $[Fe(H_2O)_6]Cl_3$; $Fe^{+3} = 3d^5\,4S^0$ $H_2O$; WFL So $t_{2g}^{111}\,eg^{11}$
(C) $K_3[FeF_6]$; $Fe^{+3} = 3d^5\,4S^0$ $F^-$ ; WFL, So $t_{2g}^{111}\,eg^{11}$
(D) $K_4[Mn\,F_6]$; $Mn^{+2} = 3d^5\,4S^0$ $F^-$ ; WFL, So $t_{2g}^{111}\,eg^{11}$

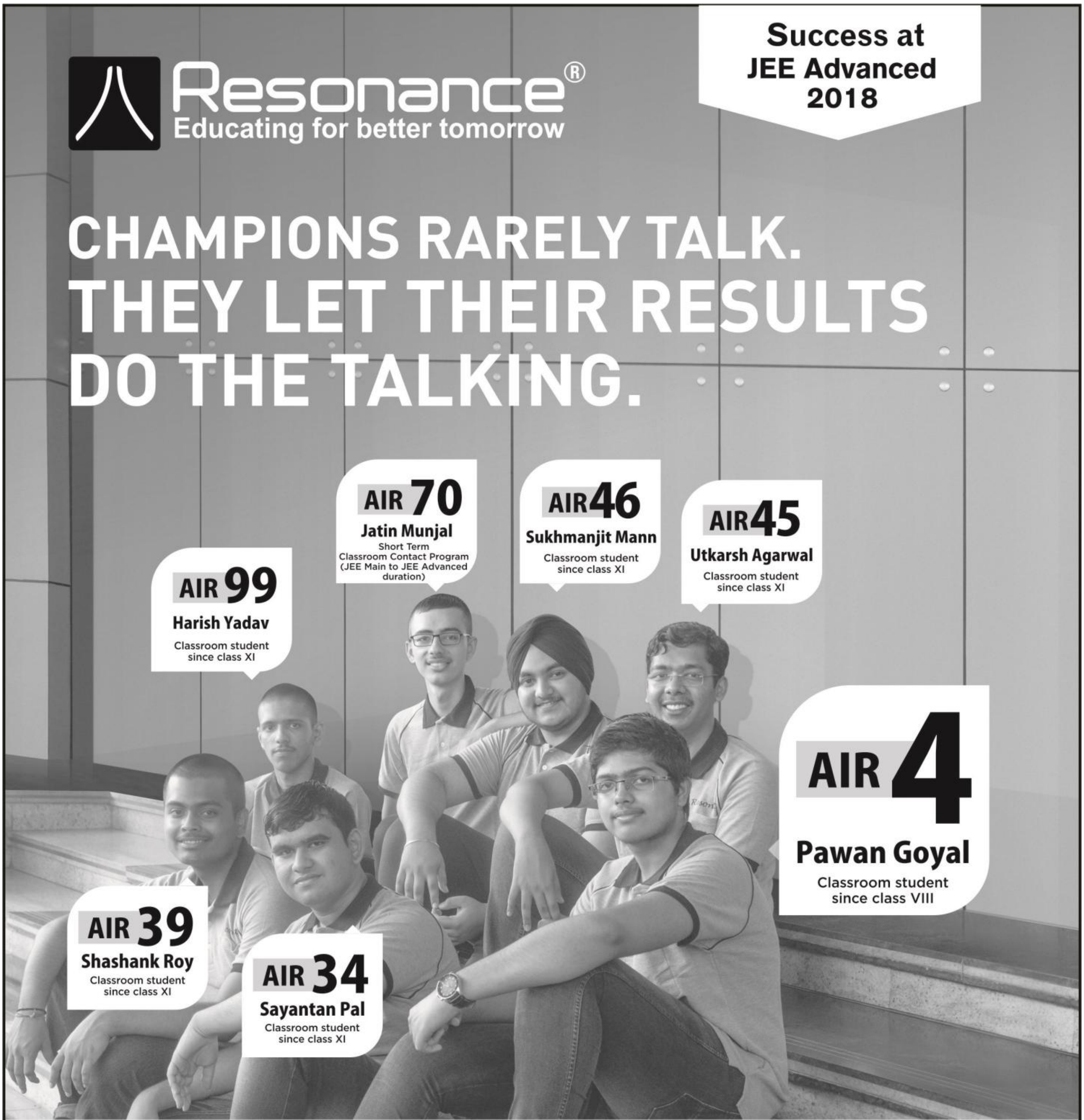
**80.** Which of the following chemical may be used to identify three unabelled beakers containing conc. NaOH, conc. $H_2SO_4$ and and water.
(A) $NH_4NO_3$ (B) NaCl (C) $(NH_4)_2CO_3$ (D) HCOONa

**Ans.** **(A,C)**

**Sol.** (A) $NH_4NO_3$
$\xrightarrow{\text{Conc. NaOH}} NH_3\uparrow + NaNO_3 + H_2O$
$\xrightarrow{\text{Conc. } H_2SO_4} (NH_4)_2SO_4 + NO_2\uparrow + O_2 + H_2O$

(C) $NH_4)_2CO_3$
$\xrightarrow{\text{Conc. NaOH}} NH_3\uparrow + Na_2CO_3 + H_2O$
$\xrightarrow{\text{Conc. } H_2SO_4} (NH_4)_2SO_4 + CO_2\uparrow + H_2O$

$NH_3$ pungent smell gas, $NO_2$ brown coloured gas, $CO_2$ colourless, ouderless gas (effervescence)
$NH_4NO_3$ and $(NH_4)_2CO_3$ not react with water.




**1** Student in AIR Top - 5 ★ **5** Students in AIR Top - 50 ★ **7** Students in AIR Top - 100

ALL FROM CLASSROOM PROGRAM

**ADMISSIONS OPEN FOR 2019-20**

Classes: V to XII & XII+
Target: JEE (Main+Advanced)
JEE (Main) | AIIMS/ NEET
Pre-foundation | Commerce & CLAT

**ResoNET Dates**
9th & 16th June 2019

**COURSE: VIJAY (JR)**
FOR CLASS: XIII
Target: JEE (Main+Advanced) 2020
Course Starts from
10th June 2019

**Resonance Eduventures Limited**
Registered & Corporate Office: CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Rajasthan) - 324005
Tel. No.: 0744-2777777, 2777700 | CIN: U80302RJ2007PLC024029

Toll Free:
1800 258 5555
website: www.resonance.ac.in