Sample Paper

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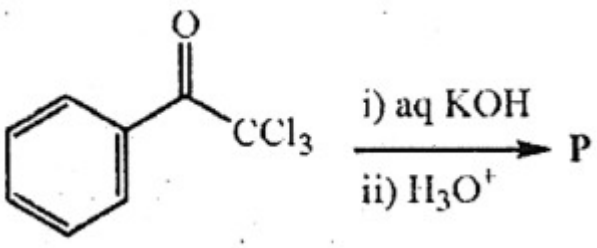
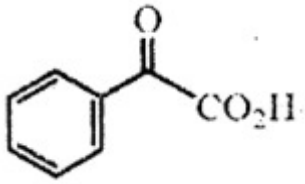
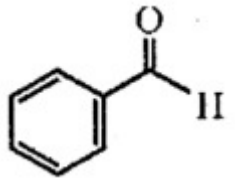
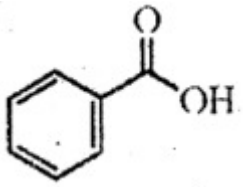
Chemistry

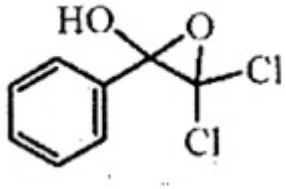
Q.No. 1 One of the products of the following reaction is P.



(A) 

(B) 

(C) 

(D) 

Q.No. 2 The main reason that $SiCl_4$ is easily as compared to CCl_4 is that

(A) Si — Cl bond is weaker than C — Cl/ bond.

(B) $SiCl_4$ can form hydrogen bonds.

(C) $SiCl_4$ is covalent

(D) Si can extend its coordination number beyond four.

Q.No. 3 ADP and ATP differ in the number of

(A) phosphate units

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(B) ribose units

(C) adenine base

(D) nitrogen atom

Q.No. 4 The melting points of (i) $BeCl_2$, (ii) $CaCl_2$, and (iii) $HgCl_2$ follows the order (i) $BeCl_2$ (ii) $CaCl_2$ (iii) $HgCl_2$

(A) i < ii < iii

(B) iii < i < ii

(C) i < iii < ii

(D) ii < i < iii

Q.No. 5 Which one of the following is a condensation polymer ?

(A) PVC

(B) Tenon

(C) Dacron

(D) Polystyrene

Q.No. 6 $[X] +$ dil. $H_2SO_4 \rightarrow [Y]$ Colorless,suffocating gas $[Y] + K_2Cr_2O_7 + H_2SO_4 \rightarrow$ Green colouration of solution Then $[X]$ and $[Y]$ are

(A) so_3^{2-}, sO_2

(B) Cl^-, HCl

(C) s^{2-}, H_2S

(D) co_3^{2-}, co_2

Q.No. 7 Cyclopentano! on reaction with NaH followed by CS_2 and CH_3 produces a/an

(A) ketone -

(B) alkene

(C) ether

(D) xanthate

Q.No. 8 The heat of neutralization of a strong base and a strong acid is 13.7 kcal. The heat released when 0.6 mole HCI solution is added to 0.25 mole of NaOH is

(A) 3.425kcal

(B) 8.22kcal

(C) 11.645kcal

(D) 13.7kcal

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Q.No. 9 The yield of acetanilide in the reaction (100% conversion) of 2 moles of aniline with 1 mole of acetic anhydride is

(A) 270 g

(B) 135 g

(C) 675 g

(D) 177 g

Q.No. 10 The ground state magnetic property of B_2 and C_2, molecules will be

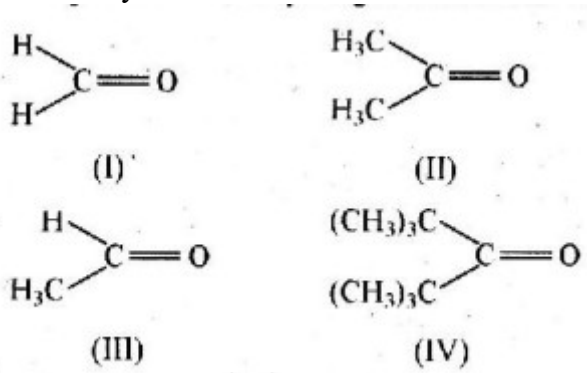
(A) B_2 paramagnetic and C_2 diamagnetic

(B) B_2, diamagnetic and C_2 paramagnetic

(C) Both are diamagnetic

(D) Both are paramagnetic

Q.No. 11 The correct order of reactivity 6r the addition reaction of the following carbonyl compounds with



ethyl magnesium iodide is

(A) I > III > II > IV

(B) IV > III > II > I

(C) I > II > IV > II

(D) III > II > 1 > $\mathbb{IV}$

Q.No. 12 You are supplied with 500 ml each of 2N HCl and 5N HCI. What is the maximum volume of 3M HCI that you can prepare using only these two solutions ?

(A) 250 ml

(B) 500 ml

(C) 750 ml

(D) 1000 ml

Q.No. 13 The correct basicity order of the following lanthanide ions is

(A) $La^{3-} > Lu^{3-} > Ce^{3-} > Eu^{3-}$

(B) $Ce^{3-} > Lu^{3-} > La^{3-} > Eu^{3+}$

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(C) $Lu^{3-} > Ce^{3-} > E^{3-} > La^{3+}$

(D) $La^{3+} > Ce^{3+} > Eu^{3-} > Lu^{3-}$

Q.No. 14 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

Q.No. 15 If the given four electronic configurations (i) n = 4, / = 0 (ii) n = 4, l = 0 (iii) n = 3, / = 2 (iv) n = 3, / = 1 are arranged in order of increasing energy. then the order will be

(A) (iv) < (ii) < (iii) < (i)

(B) (ii) < (iv) < (i) < (iii)

(C) (i) < (iii) < (ii) < (iv)

(D) (iii) < (i) < (iv) < (ii)

Q.No. 16 Which of the following is present in maximum amount in 'acid rain' ?

(A) HNO_3

(B) H_2SO_4

(C) HCl

(D) H_2CO_3

Q.No. 17 You are supplied with 500 ml each of 2N HCI and 5N HCI. What is the maximum volume of 3M HCI that you can prepare using only these two solutions ?

(A) 250 ml

(B) 500ml

(C) 750 ml

(D) 1000 ml

Q.No. 18 Which of the following solutions will turn violet when a drop of lime juice is added to it ?

(A) A solution of Nal

(B) A solution mixture of KI and $NalO_3$

(C) A solution mixture of Nal and KI

(D) A solution mixture of KIO_3, and $NalO_3$,

Q.No. 19 Assuming the compounds to be completely dissociated in aqueous solution, identify the pair of the solutions that can be expected to be isotonic at the same temperature :

(A) 0.01 M Urea and 0.01 M NaCl

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(B) 0.02 M NaCl and 0.0t M Na_2SO_4

(C) 0.03 M NaCl and 0.02 M MgCl,

(D) 0.01 M Sucrose and 0.02 M glucose

Q.No. 20 For the equilibrium H_2O (l) ⇌ H_2O which of the following is correct ?

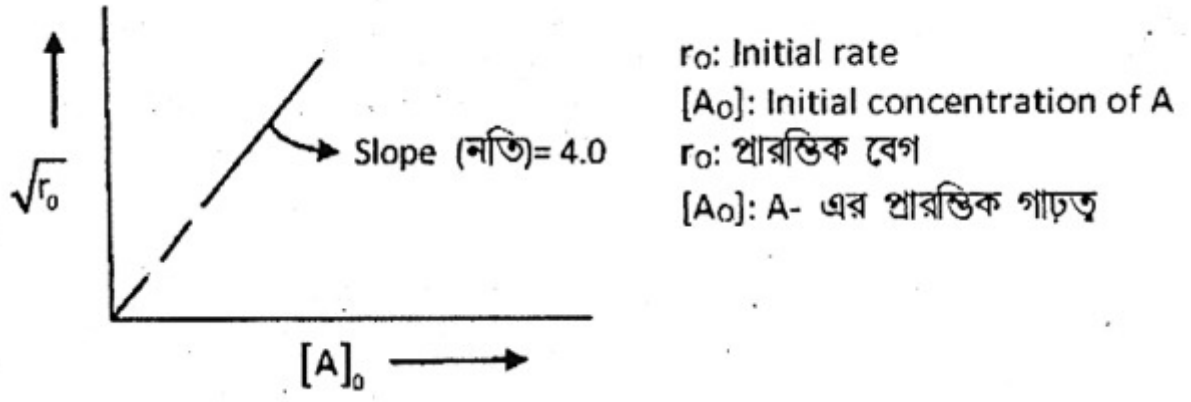
(A) $\Delta G = 0, \Delta H < 0, \Delta S < 0$

(B) $\Delta G < 0, \Delta H > 0, \Delta S > 0$

(C) $\Delta G > 0, \Delta H = 0, \Delta S > 0$

(D) $\Delta G = 0, \Delta H > 0 , \Delta S > 0$

Q.No. 21 The kinetic study of a reaction like vA —> P at 300 K provides the following curve, where concentration is taken in mol dm" and time in min.



Identify the correct order-(n) and rate constant (k) :

(A) n = 0, k = 4.0 mol dm^{-3} min^{-1}

(B) n = 1/2, k = 2.0 $mol^{1/2}$ $dm^{-3/2}min^{-1}$.

(C) n = 1, k = 8.0min^{-1}

(D) n = 2, k=16.0 $dm^3mol^{-1}min^{-1}$

Q.No. 22 Among Me_3N, MeCN (Me = methyl group) the electronegativity of N is in the order :

(A) McCN + C_5H_5N > Me_3N

(B) C_5H_5N > Me_3N > MeCN

(C) Me_3N > MeCN > C_5H_5N

(D) Electronegativity same in all

Q.No. 23 Equal weights Of ethane and hydrogen are mixed in an empty container at 25°C. The fraction of total pressure exerted by hydrogen is

(A) 1 : 2

(B) 1 : 1

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(C) 1:16

(D) 15:16

Q.No. 24 During a reversible adiabatic process, the pressure of a gas is found to be proportional to the cube of its absolute temperature. The ratio $\frac{C_p}{C_v}$ of gas is

(A) $\frac{3}{2}$

(B) $\frac{7}{2}$

(C) $\frac{5}{3}$

(D) $\frac{9}{7}$

Q.No. 25 The correct order of acid strengths of benzoic acid (X), peroxybenzoic acid (Y) and p-nitrobenzoic acid (Z) is

(A) Y > Z >X

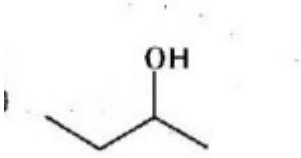
(B) Z > Y > X

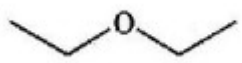
(C) Z > X > Y

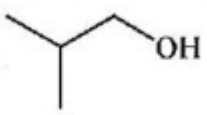
(D) Y > X > Z

Q.No. 26 Here N is

(A)

(B) 

(C) 

(D) 

Q.No. 27 The half life of C^{14} is 5760 years. For a 200 mg sample of C^{14} the time taken to change to 25 mg is

(A) 11520 years

(B) 23040 years

(C) 5760 years

(D) 17280 years

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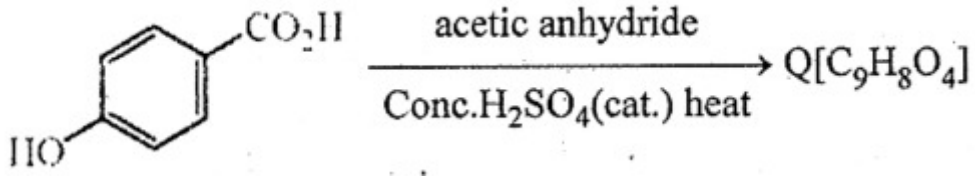
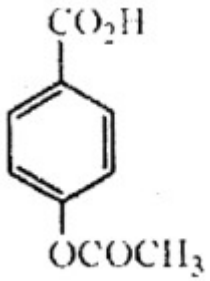
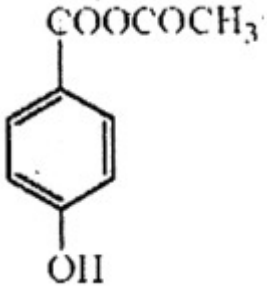
Q.No. 28 For the reaction below the product is Q.

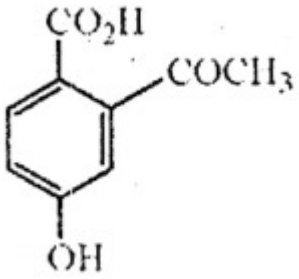




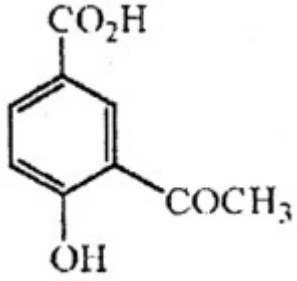
(A)



(B)



(C)



(D)

Q.No. 29 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

Q.No. 30 How many faradays are required to reduce 1 mol of Cr_2O_72 to Cr^{3-} in acid medium ?

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(A) 2

(B) 3

(C) 5

(D) 6

Q.No. 31 Given thc standard half-cell potentials $\left(E^{0}\right)$ following as $\mathrm{Zn}=\mathrm{Zn}^{2+}-2\mathrm{e}^{-}\ E^{0}-+0.76\mathrm{V}$
$\mathrm{Fe}=\mathrm{Fe}^{2-}+2\mathrm{e}^{-}\ E^{0}=0.41\mathrm{V}$ Then the standard e.m.f. of the ecll with thereaetiot'
$\mathrm{Fe}^{2+}+\mathrm{IZn}\rightarrow\mathrm{Zn}^{2+}+\mathrm{Fe}$ is

(A) $-0.35\mathrm{V}$

(B) $+0.35\mathrm{V}$

(C) $+1.17\mathrm{V}$

(D) $-1.17\mathrm{V}$

Q.No. 32 Which one of the following electronic arrangements is absurd ?

(A) n = 3, I=1, m=-1

(B) n = 3, I=0,m=0

(C) n = 2, I=0,m=-1

(D) n = 2, 1=1,m=0

Q.No. 33 $\mathrm{CH_3-C\equiv CMgBr}$ can be prepared by the reaction of

(A) $\mathrm{CH_3-C=C-Br}$ with $\mathrm{MgBr_2}$

(B) $\mathrm{CH_3-C=CH}$ with $\mathrm{MgBr_2}$

(C) $\mathrm{CH_3-C\equiv CH}$ with KBr and Mg

(D) $\mathrm{CH_3-C=ClI}$ with $\mathrm{CH_3MgBr}$

Q.No. 34 At room temperature, the reaction betwæn water and fluorine produces

(A) HF and $\mathrm{H_2O_2}$

(B) HF, $\mathrm{O_2}$ and $\mathrm{F_2O_2}$

(C) $\mathrm{F^-}$, $\mathrm{O_2}$ and $\mathrm{H^+}$

(D) $HOFandHF$

Q.No. 35 The compound that would produce a nauseating smell odour with a hot mixture of chloroform and ethanolic potassium hydroxide is

(A) $\mathrm{PbCONH_2}$

(B) $\mathrm{PbNHCH_3}$

(C) $\mathrm{PbNH_2}$

(D) PbOH

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Q.No. 36 Methoxybenzene on treatment with HI produces

(A) Iodobenzene and ethanol

(B) Phenol and methyl iodide

(C) Iodobenzene and methyl iodide

(D) Phenol and methanol

Q.No. 37 In the crystalline solid MSO_4. nH_2O of molar mass 250 $gmol^{-1}$, the percentage of anhydrous salt is 64 by weight. The value of n is

(A) 2

(B) 3

(C) 5

(D) 7

Q.No. 38 The shape of XeF_5-

(A) Square pyramid

(B) Trigonal bipyramidal

(C) Planar

(D) Pentagonal bipyramid

Q.No. 39 In the IUPAC system, $PhCH_2$,CH_2,CO_2,H is named as

(A) 3-phenylpropanoic acid

(B) benzylacetic acid

(C) carboxyethylbenzene

(D) 2-phenylpropanoic acid

Q.No. 40 When $BaCl_2$, is added to an aqueous salt solution, a white precipitate is obtained. The anion among CO_3^2, SO_3^2 and SO_4^2 that was present in the solution can be

(A) CO_3^2 but not any of the other two

(B) SO_3^2 but not any of the other two

(C) SO_4^2- but not any of the other two

(D) Any of them

Answer Sheet

Q.No	Answer
Q.No. 1	(C)

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Q.No. 2	(D)
Q.No. 3	(A)
Q.No. 4	(B)
Q.No. 5	(C)
Q.No. 6	(A)
Q.No. 7	(D)
Q.No. 8	(A)
Q.No. 9	(B)
Q.No. 10	(A)
Q.No. 11	(A)
Q.No. 12	(D)
Q.No. 13	(D)
Q.No. 14	(A)
Q.No. 15	(A)
Q.No. 16	(B)
Q.No. 17	(C)
Q.No. 18	(B)
Q.No. 19	(C)
Q.No. 20	(D)
Q.No. 21	(D)
Q.No. 22	(A)
Q.No. 23	(D)
Q.No. 24	(A)
Q.No. 25	(C)
Q.No. 26	(B)
Q.No. 27	(D)
Q.No. 28	(A)
Q.No. 29	(D)
Q.No. 30	(D)
Q.No. 31	(B)
Q.No. 32	(C)
Q.No. 33	(D)
Q.No. 34	(C)
Q.No. 35	(C)
Q.No. 36	(B)
Q.No. 37	(C)
Q.No. 38	(C)
Q.No. 39	(A)

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Q.No. 40	(D)

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