Subject :: Chemistry

Q. No. 1 0021001	**In which mode of expression, the concentration of a solution remains independent of temperature?**
Option A	Molarity
Option B	Normality
Option C	Formality
Option D	Molality
Correct Option	**D**

Q. No. 2 0021002	**A mixture of x containing 0.02 mol of $[Co(NH_3)_5SO_4]Br$ and 0.02 mol of $[Co(NH_3)_5Br]SO_4$ was prepared in 2L of solution.** **1L of mixture X + excess $AgNO_3$ ⟶ Y** **1L of mixture X + excess $BaCl_2$ ⟶ Z** **The number of moles of Y and Z are**
Option A	0.01, 0.01
Option B	0.02, 0.01
Option C	0.01,0.02
Option D	0.02, 0.02
Correct Option	**A**

Q. No. 3 0021003	**The equivalent weight of $MnSO_4$ is half its molecular weight when it is converted to**
Option A	Mn_2O_3
Option B	MnO_2
Option C	MnO_4^{1-}
Option D	MnO_4^{2-}
Correct Option	**B**

Q. No. 4 0021004	**For the redox reaction** $xMnO_4^{1-} + y\,C_2O_4^{2-} + zH^{1+} \rightarrow Mn^{2+} + CO_2 + H_2O$ the coefficients x,y,z are
Option A	2, 5, 16
Option B	16, 5, 2
Option C	5, 16, 2
Option D	2, 16, 5
Correct Option	**A**

Q. No. 5 0021005	**Consider a titration of potassium dichromate solution with acidified Mohr's salt solution using diphenylamine as indicator. The number of moles of Mohr's**

	salt required per mole of dichromate is
Option A	3
Option B	4
Option C	5
Option D	6
Correct Option	**D**

Q. No. 6 0021006	**The volume strength of 1.5 N H_2O_2 solution is**
Option A	4.8
Option B	8.4
Option C	3.0
Option D	8.o
Correct Option	**B**

Q. No. 7 0021007	**The number of nodal planes in a p_x orbital is**
Option A	One
Option B	Two
Option C	Three
Option D	Four
Correct Option	**A**

Q. No. 8 0021008	**Which of the following has maximum number of unpaired electrons?**
Option A	Mg^{+2}
Option B	Ti^{+3}
Option C	V^{+3}
Option D	Fe^{+2}
Correct Option	**D**

Q. No. 9 0021009	**X mL of H_2 gas effuses through a hole in a container in 5 seconds. The time taken for the effusion of the same volume of the gas specified below, under identical conditions, is**
Option A	10s, He
Option B	20s, O_2
Option C	25s, CO
Option D	55s, CO_2
Correct Option	**B**

Q. No. 10 0021010	**For an endothermic reaction where ΔH represents the enthalpy of the reaction in KJ mol^{-1}, the minimum value for the energy of activation will be**

Option A	Less than ΔH
Option B	Zero
Option C	More than ΔH
Option D	Equal to ΔH
Correct Option	**C**

Q. No. 11 0021011	**A monoatomic ideal gas undergoes a process in which the ratio of P to V at any instant is constant and equals 1. What is the molar heat capacity of the gas?**
Option A	4R/2
Option B	3R/2
Option C	5R/2
Option D	0
Correct Option	**A**

Q. No. 12 0021012	**For the reaction,** $SO_2(g) + \frac{1}{2} O_2(g) \rightleftharpoons SO_3(g)$, if $K_P = K_C(RT)^x$ **where the symbols have usual meaning then the value of x is : (assuming ideality)**
Option A	1/2
Option B	1
Option C	-1
Option D	-1/2
Correct Option	**D**

Q. No. 13 0021013	**Pure ammonia is placed in a vessel at a temperature where its dissociation constant (α) is appreciable. At equilibrium,**
Option A	KP does not change significantly with pressure.
Option B	α does not change with pressure.
Option C	The concentration of NH_3 does not change with pressure.
Option D	The concentration of hydrogen is less than that of nitrogen.
Correct Option	**A**

Q. No. 14 0021014	**The pH value of 10^{-8} M solution of HCl in water is**
Option A	8
Option B	-8
Option C	Between 7 and 8
Option D	Between 6 and 7
Correct Option	**D**

Q. No. 15 0021015	**For a sparingly soluble salt A_pB_q, the relationship of its solubility product (L_S) with its solubility(S) is**
Option A	$L_S = S^{p+q} p^p q^q$
Option B	$L_S = S^{p+q} p^q q^p$
Option C	$L_S = S^{pq} p^p q^q$
Option D	$L_S = S^{pq}(pq)^{(p+q)}$
Correct Option	**A**

Q. No. 16 0021016	**In a solid AB having the NaCl structure, A atom occupies the corners of the cubic unit cell. If all the face -centred atoms along one of the axes are removed, then the resultant stoichiometry of the solid is**
Option A	AB_2
Option B	A_2B
Option C	A_4B_3
Option D	A_3B_4
Correct Option	**D**

Q. No. 17 0021017	**When mercuric iodide is added to the aqueous solution of potassium iodide,**
Option A	Freezing point is raised.
Option B	Freezing point is lowered.
Option C	Freezing point does not change.
Option D	Boiling point does not change.
Correct Option	**A**

Q. No. 18 0021018	**The standard reduction potential values of three metallic cations, X, Y and Z are 0.52, -3.03 and -1.18 V respectively. The order of reducing power of the corresponding metal is**
Option A	Y>Z>X
Option B	X>Y>Z
Option C	Z>Y>X
Option D	Z>X>Y
Correct Option	**A**

Q. No. 19 0021019	**The specific rate constant of a first order reaction depends on the**
Option A	Concentration of the reactant
Option B	Concentration of the product
Option C	Time
Option D	Temperature
Correct Option	**D**

Q. No. 20 0021020	**Under the same reaction conditions, the initial concentration of 1.386 mol dm^{-3} of a substance becomes half in 40 s and 20 s through first order and zero order kinetics, respectively.** **The ratio (k_1/k_0) of the rate constants for first order (k_1) and zero order (k_0) of the reaction is**
Option A	0.5 mol^{-1} dm^3
Option B	1.0 mol dm^{-3}
Option C	1.5 mol dm^{-3}
Option D	2.0 $mol^{-1}dm^3$
Correct Option	**A**

Q. No. 21 0021021	**Among the following electrolytes, which is the most effective coagulating agent for Sb_2S_3 solution?**
Option A	Na_2SO_4
Option B	$CaCl_2$
Option C	$Al_2(SO_4)_3$
Option D	NH_4Cl
Correct Option	**C**

Q. No. 22 0021022	**The correct order of acidic strength is**
Option A	$Cl_2O_7 > SO_2 > P_4O_{10}$
Option B	$CO_2 > N_2O_5 > SO_3$
Option C	Na2O > MgO > Al_2O_3
Option D	$K_2O > CaO > MgO$
Correct Option	**A**

Q. No. 23 0021023	**The intermolecular interaction that is dependent on the inverse cube of distance between the molecules is**
Option A	Ion- ion interaction
Option B	ion-dipole interaction
Option C	London force
Option D	hydrogen bond
Correct Option	**B**

Q. No. 24 0021024	**Which species has the maximum number of lone pair of electrons on the central atom?**
Option A	ClO_3^-
Option B	XeF_4
Option C	SF_4
Option D	I_3^-
Correct	**D**

Option	

Q. No. 25 0021025	**From the following statements regarding H_2O_2, choose the incorrect statement.**
Option A	It can act only as an oxidizing agent.
Option B	It decomposes on exposure to light.
Option C	It has to be stored in plastic or wax lined bottles in dark.
Option D	It has to be kept away from dust.
Correct Option	**A**

Q. No. 26 0021026	**The temporary hardness of water due to calcium bicarbonate can be removed by adding**
Option A	$CaCO_3$
Option B	$Ca(OH)_2$
Option C	$CaCl_2$
Option D	HCl
Correct Option	**B**

Q. No. 27 0021027	**Which one of the following alkaline earth metal sulphates has its hydration enthalpy greater than its lattice enthalpy?**
Option A	$CaSO_4$
Option B	$BeSO_4$
Option C	$BaSO_4$
Option D	$SrSO_4$
Correct Option	**B**

Q. No. 28 0021028	**In the context of the Hall-Heroult process for the extraction of Al, which of the following statements is false?**
Option A	CO and CO_2 are produced in this process.
Option B	Al_2O_3 is mixed with CaF_2 which lowers the melting point of the mixture and brings conductivity.
Option C	Al^{+3} is reduced at the cathode to form Al.
Option D	Na_3AlF_6 serves as the electrolyte.
Correct Option	**D**

Q. No. 29 0021029	**Which ore contains both iron and copper?**
Option A	Cuprite
Option B	Chalcocite
Option C	Chalcopyrite
Option D	Malachite
Correct Option	**C**

Q. No. 30 0021030	**The product formed in the reaction of $SOCl_2$ (thionyl chloride) with white phosphorous is**
Option A	PCl_3
Option B	SO_2Cl_2
Option C	SCl_2
Option D	$POCl_3$
Correct Option	**A**

Q. No. 31 0021031	**The species having pyramidal shape is**
Option A	SO_3
Option B	BrF_3
Option C	SiO_3
Option D	OSF_2
Correct Option	**D**

Q. No. 32 0021032	**Hydrogen peroxide in its reaction with KIO4 and NH4OH respectively, is acting as a**
Option A	Reducing agent, oxidizing agent
Option B	Reducing agent, reducing agent
Option C	Oxidizing agent, oxidizing agent
Option D	Oxidizing agent, reducing agent
Correct Option	**A**

Q. No. 33 0021033	**Which one has the highest boiling point?**
Option A	He
Option B	Ne
Option C	Kr
Option D	Xe
Correct Option	**D**

Q. No. 34 0021034	**Which of the following compounds has isopropyl group?**
Option A	2,2,3,3-Tetramethyl pentane
Option B	2,2-Dimethyl pentane
Option C	2,2,3-Tetramethyl pentane
Option D	2-Methyl pentane
Correct Option	**D**

Q. No. 35	**The number of structural isomers for C_6H_{14} is**

0021035	
Option A	3
Option B	4
Option C	5
Option D	6
Correct Option	**C**

Q. No. 36 0021036	**A solution of (-)-1-chloro-1-phenylethane in toluene racemises slowly in the presence of a small amount of $SbCl_5$, due to the formation of**
Option A	carbene
Option B	carbocation
Option C	free radical
Option D	carbanion
Correct Option	**B**

Q. No. 37 0021037	**Identify the correct order of reactivity in electrophilic substitution reaction of the following compounds. (a)Benzene (b)Toluene (c)Chlorobenzene (d) Nitrobenzene**
Option A	(a)>(b)>(c)>(d)
Option B	(d)>(c)>(b)>(a)
Option C	(b)>(a)>(c)>(d)
Option D	(b)>(c)>(a)>(d)
Correct Option	**C**

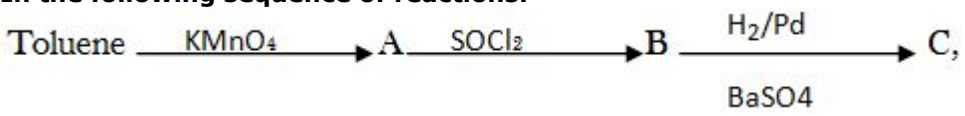
Q. No. 38 0021038	**2-Phenyl propene on acidic hydration gives**
Option A	2-phenyl-2-propanol
Option B	2-phenyl-1-propanol
Option C	3-phenyl-1-propanol
Option D	1-phenyl-2-propanol
Correct Option	**A**

Q. No. 39 0021039	**Me_3C-MgCl on reaction with D_2O produce**
Option A	Me_3CD
Option B	Me_3COD
Option C	$(CD)_3CD$
Option D	$(CD)_3COD$
Correct Option	**A**

Q. No. 40 0021040	**Under Wolff - Kishner reduction conditions, the reduction which may be brought about is:**
Option A	Benzophenone to diphenyl methane
Option B	Benzaldehyde to benzyl alcohol
Option C	Cyclohexanone to cyclohexanal
Option D	Cyclohexanone to cyclohexanol
Correct Option	**A**

Q. No. 41 0021041	**The compound that will react most readily with NaOH to form methanol is:**
Option A	$(CH_3)_4N^+I^-$
Option B	CH_3OCH_3
Option C	$CH_3)_3S^+I^-$
Option D	$(CH_3)_3Cl$
Correct Option	**A**

Q. No. 42 0021042	**When phenyl magnesium bromide react with t-butanol, the product formed would be**
Option A	Benzene
Option B	Phenol
Option C	t-Butyl benzene
Option D	t-Butyl phenyl ether
Correct Option	**A**

Q. No. 43 0021043	**In the following sequence of reactions:**  **The product C is**
Option A	C_6H_5COOH
Option B	$C_6H_5CH_3$
Option C	$C_6H_5CH_2OH$
Option D	C_6H_5CHO
Correct Option	**D**

Q. No. 44 0021044	**Which of the following halides is least stable and has doubtful existence?**
Option A	CCl_4
Option B	GeI_4
Option C	SnI_4
Option D	PbI_4
Correct	**D**

Option	

Q. No. 45 0021045	**Which one of the following properties is not shown by NO ?**
Option A	It is a neutral oxide.
Option B	It combines with oxygen to form nitrogen di oxide.
Option C	Its bond order is 2.5 .
Option D	It is diamagnetic in gaseous state.
Correct Option	**D**

Q. No. 46 0021046	**In the presence of a small amount of phosphorous, aliphatic carboxylic acids react with chlorine or bromine to yield a compound in which α - hydrogen has been replaced by halogen. This reaction is known as**
Option A	Wolff- Kishner reaction
Option B	Etard reaction
Option C	Hell-Volhard-Zelinsky reaction
Option D	Rosenmund reaction
Correct Option	**C**

Q. No. 47 0021047	**On heating an aliphatic primary amine with chloroform and ethanolic potassium hydroxide, the organic compound formed is**
Option A	An alkyl cyanide
Option B	an alkyl isocyanide
Option C	an alkanol
Option D	an alkanediol
Correct Option	**B**

Q. No. 48 0021048	**Which one is classified as a condensation polymer?**
Option A	Teflon
Option B	Acrylonitrile
Option C	Dacron
Option D	Neoprene
Correct Option	**C**

Q. No. 49 0021049	**Synthesis of each molecule of glucose in photosynthesis involves**
Option A	6 molecules of ATP
Option B	8 molecules of ATP
Option C	10 molecules of ATP
Option D	18 molecules of ATP
Correct Option	**D**

Q. No. 50 0021050	**Anemia is caused by deficiency of vitamin**
Option A	B_1
Option B	B_2
Option C	B_6
Option D	B_{12}
Correct Option	**D**