### INDIAN SCHOOL AL WADI AL KABIR

## DEPARTMENT OF SCIENCE

DATE: 20.09.2021

CLASS: XII

### SUBJECT: CHEMISTRY

MAX MARKS: 35 TIME – 1 HR 30 MIN

General Instructions

The paper consists of three sections. Each question carries 1 mark. All questions are compulsory.

Q.NO	QUESTIONS	MARKS
	SECTION A – CASE STUDY QUESTIONS	
	Group 15 includes nitrogen, phosphorus, arsenic, antimony, bismuth and moscovium. The valence shell electronic configuration of these elements is $ns^2 np^3$ . Nitrogen and phosphorus are non-metals, arsenic and antimony metalloids, bismuth and moscovium are typical metals. All the elements of Group 15 form hydrides of the type EH <sub>3</sub> where E = N, P, As, Sb or Bi. The hydrides show regular gradation in their properties. Nitrogen differs from the rest of the members of this group. Some important compounds of Group 5 are NH <sub>3</sub> ,HNO <sub>3</sub> etc.	
1	The group 15 hydride which has the highest bond angle is a. NH <sub>3</sub> b. PH <sub>3</sub> c. AsH <sub>2</sub> d. SbH <sub>2</sub>	1
2	The products obtained when Zinc reacts with dilute nitric acid are a. Zn(NO <sub>3</sub> ) <sub>2</sub> , H <sub>2</sub> O, N <sub>2</sub> O b. Zn(NO <sub>3</sub> ) <sub>2</sub> , H <sub>2</sub> O, NO <sub>2</sub> c. Zn(NO <sub>3</sub> ) <sub>2</sub> , H <sub>2</sub> O, NO d. Zn(NO <sub>3</sub> ) <sub>2</sub> , H <sub>2</sub> O, N <sub>2</sub>	1
3	Predict the conditions required for the formation of NH <sub>3</sub> .	1
	a. $200 \times 10^5$ K, 700 atm, iron with K <sub>2</sub> O and Al <sub>2</sub> O <sub>3</sub> b. $200 \times 10^5$ Pa, 700 K, iron oxide with K <sub>2</sub> O and Al <sub>2</sub> O <sub>3</sub> c. 2 atm, 700 K, Fe <sub>2</sub> O <sub>3</sub> d. 200 atm, 200 K, iron with K <sub>2</sub> O and Al <sub>2</sub> O <sub>3</sub>	
4	The increase in size from Arsenic to Bismuth is marginal because	1
	<ul><li>a. Bi is less electronegative as compared to Arsenic and antimony</li><li>b. Bi has completely filled d orbitals which offer poor shielding effect.</li><li>c. Bi has completely filled d and f orbitals which offer poor shielding effect.</li><li>d. The atomic number of Bi is 83.</li></ul>	

5	Choose the incorrect statements.				
	i. BiH <sub>3</sub> is the strongest reducing agent among the hydrides of group 15 elements.				
	ii. N can form $R_3N=0$ but P cannot form $R_3P=0$ .				
	iii. Pentahalides of group 15 are more covalent than trihalides.				
	a. Only I b. Only ii				
	c. Both ii and iii d. i, ii, iii				
	SECTION B – MULTIPLE CHOICE QUESTIONS				
6					
0	If three elements X Y and Z crystallise in a cubic solid with X atoms at the corners	-			
	Y atoms at the cube centre and Z atoms at the faces of the cube, then write the				
	formula of the compound				
	Tornidia of the compound.				
	• VV7				
	$c. XYZ_3$				
	$d. XY_2Z$				
7	Choose the structure of major monohalogen product in the following reaction.	1			
	~				
	$   + Br_2 \longrightarrow$				
	1				
	a. D.				
	Br Br				
	c. d.				
8	The IUPAC name of the ether $CH_2 = CH-CH_2OCH_3$ is	1			
	a. Alkyl methyl ether				
	b. 1-Methoxyprop-2-ene				
	c. 3-Methoxyprop-1-ene				
	d Vinyl dimethyl ether				
9	In nucleic acids, the individual nucleotides are linked through	1			
	In nucleic uclus, the marviaturi nucleotides are iniked unough	1			
	a pentide linkage h phosphodiostar linkage				
	a. peptide linkage d. hydrogen bonds				
	c. annue mikage u. nyurogen bonus				
1					

10	<ul> <li>The formation of O<sub>2</sub><sup>+</sup>[PtF<sub>6</sub>]<sup>-</sup> is the basis for the formation of Xenon fluorides. This is because</li> <li>a. O<sub>2</sub> and Xenon have comparable electronegativities.</li> <li>b. O<sub>2</sub> and Xenon have comparable electron gain enthalpies.</li> <li>c. both O<sub>2</sub> and Xenon are gases</li> <li>d. O<sub>2</sub> and Xenon have comparable ionisation enthalpies.</li> </ul>		
11	A metallic crystal crystallises into a lattice containing a sequence of layers ABABAB Any packing of spheres leaves out voids in the lattice. What percentage by volume of lattice is empty space? a. 74% b. 26% c. 52.4% d. 68%	1	
12	Predict the product(s) (CH3)3CBr + KOHa. (CH3)3CBr + KBr c. (CH3)2C=CH2 + KBr + H2Ob. (CH3)3C-O-CH2CH3 + KBr d. CH3COCH3 + HCHO	1	
13	<ul> <li>Which of the following reagents cannot, be used to oxidise primary alcohols to aldehydes?</li> <li>a. CrO<sub>3</sub> in anhydrous medium</li> <li>b. KMnO<sub>4</sub> in acidic medium</li> <li>c. Pyridinium chlorochromate</li> <li>d. Heat in the presence of Cu at 573 K</li> </ul>	1	
14	<ul> <li>Choose the correct options.</li> <li>i. Curdling of milk is an example of denaturation of proteins.</li> <li>ii. Keratin protein present in hair is a globular protein.</li> <li>iii. The reaction of glucose with Br<sub>2</sub> water indicates the presence of aldehyde functional group.</li> <li>iv. Glycine is the only optically active amino acid.</li> <li>a. Only iv</li> <li>b. i and ii</li> <li>c. i, iii and iv</li> <li>d. i and iii</li> </ul>	1	
15	Among the following molecules,         i. XeO <sub>3</sub> ii. XeOF <sub>4</sub> iii. XeF <sub>6</sub> those having same number of lone pairs on Xe are         a. i and ii only         b. i and iii only         c. ii and iii only         d. i, ii and iii	1	
16	CCl <sub>4</sub> molecules are held in the crystal lattice by a. London forces b. dipole-dipole interactions. c. covalent bonds d. coulombic forces	1	

17	How will you bring about the following conversions?				
	Propene to Nitropropane				
	a. Step 1-HBr Step 2- AgNO <sub>2</sub>				
	b. Step 1- HBr, peroxide Step 2- KNO <sub>2</sub>				
	c. Step $1 - HF$ Step $2 - KNO_2$				
	d. Step 1 – HBr. peroxide Step 2 – AgNO <sub>2</sub>				
	a. step 1 HBI, peroxide step 2 Hgr(02				
18	The ether				
	when treated with HI produces				
	a. b.				
	$\langle \rangle \rightarrow I + CH_3O \langle \rangle \rangle$ $\langle \rangle \rightarrow CH_2OH^+I \langle \rangle$				
	c. d.				
	-CH <sub>2</sub> I+ HO-				
10	The reason for the double balical structure of DNA is the exerction of				
19	a disulphide linkages				
	a. disulplide linkages b. van der Waals forces				
	c. Hydrogen bonds				
	d All of these				
	u. All of these				
20	Which of the following order is not correct for halogens?	1			
20	a. Melting point- $F_2 < Cl_2 < Br_2 < I_2$	1			
	b. Bond dissociation enthalpy - $I_2 < F_2 < Br_2 < Cl_2$				
	c. Electron gain enthalpy $-I < Br < Cl < F$				
	d. Oxidising power - $I_2 < Br_2 < Cl_2 < F_2$				
	a. Ortaising power - $12 \times D12 \times C12 \times 12$				
21	The radius of an atom is 220 pm. If it crystallises in a simple cubic lattice, what is	1			
	the length of the side of the unit cell?				
	a. 110 pm				
	b. 508 pm				
	c. 622.2 pm				
	d. 440 pm				
22	Effect the following conversions	1			
	Conversion Reagent				
	i- Phenol to benzoquinone a. 85% H <sub>3</sub> PO <sub>4</sub> , 440 K				
	ii. Propene to propanol b. $Na_2Cr_2O_7$ , $H_2SO_4$				
	iii. Propan-2-ol to propene c. NaBH <sub>4</sub>				
	iv. Propanone to propan-2-ol d. $B_2H_6$ , $H_2O$ , $3H_2O_2$ , $OH^-$				

	a. i - b, ii - c, iii - a, iv - d b. i - b, ii - d. iii - a, iv - c c. i - c, ii - a. iii - d, iv - b d. i - d, ii - b. iii - a, iv - c	
23	Choose the alcohol which reacts most readily with Lucas reagent. a. CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> OH b. CH <sub>3</sub> -CH -CH <sub>3</sub> OH c. $CH_3 - CH_3 - OH - OH - OH - CH_3OH$ d. $CH_3 - CH - CH_2OH$	1
	I CH <sub>3</sub>	
24	<ul> <li>Which of the following analogies is incorrect?</li> <li>a. Ostwald process: HNO<sub>3</sub> ::Deacon's process : Cl<sub>2</sub></li> <li>b. Bi: Trihalide::N: Pentahalide</li> <li>c. Nitrogen: Diatomic:: Phosphorus: Tetraatomic</li> <li>d. SO<sub>2</sub> : Angular:: BrF<sub>5</sub> : Square pyramidal</li> </ul>	1
25	A metal (atomic mass 50 u) has a body centred cubic crystal structure. The density of metal is 5.96 gcm <sup>-3</sup> . Find the volume of the unit cell. a. $27.8 \times 10^{-24}$ cm <sup>3</sup> b. $2.78 \times 10^{-24}$ cm <sup>3</sup> c. $27.8 \times 10^{-23}$ cm <sup>3</sup> d. $278 \times 10^{-23}$ cm <sup>3</sup>	1
26	Which one of the following is not an allylic halide? a. 4-Bromopent-2-ene b. 3-Bromo-2-methylbut-1-ene c. 1-Bromobut-2-ene d. 4-Bromobut-1-ene	1
27	Predict the reagents in the following reaction.	1

Г

	$\begin{array}{c} \overset{OH}{\underset{i}{\mapsto}} & \overset{ONa}{\underset{i}{\mapsto}} & \overset{OH}{\underset{i}{\mapsto}} & \overset{OH}{\underset{i}{\mapsto}} \\ a. i- NaOH, ii - CO_2, iii- H^+\\ b. i- Na, ii - COOH, iii - H^+\\ c. i- NaOH, ii - CO_2, iii- NaOH\\ d. i- NaOH, ii - H_2CO_3, iii- NaOH \end{array}$				
28	Choose the correct statements about nitro phenols. i. o-Nitrophenol is more steam volatile than p-Nitrophenol. ii. o-Nitrophenol is less acidic than phenol.	1			
	<ul><li>iii. 2,4,6-Trinitrophenol is formed when phenol is treated with concentrated nitric acid.</li><li>iv. A mixture of ortho and para nitro phenol is called picric acid.</li></ul>				
	a. Only i				
	c. Both ii and iv d. Both i and iii				
29	<ul> <li>Which among the following is incorrect?</li> <li>i. Among the hydrides of group 16, H<sub>2</sub>O is the most acidic.</li> <li>ii. SF<sub>6</sub> is easily hydrolysed.</li> <li>iii. α- form of sulphur can be converted into β form at 369 K.</li> <li>iv. Bleaching by SO<sub>2</sub> is temporary due to the presence of nascent O.</li> </ul>	1			
	a. i and ivb. i, iii and ivc. ii and iiid. All the above				
30	High concentration of $O_3$ can be dangerously explosive. Give reason. a. $\Delta S = +ve$ b. $\Delta H = -ve$ c. $\Delta G = -ve$ d. All of the above	1			
	ASSERTION REASON TYPE				
31	Assertion: Crystalline solids are anisotropic in nature Reason: Crystalline solids melt at a sharp and characteristic temperature.	1			
	a. Assertion and Reason are both correct and Reason is the correct explanation of Assertion.				
	b. Assertion and Reason are both correct but Reason is not the correct explanation of Assertion.				
	<ul><li>d. Assertion is wrong but Reason is correct.</li></ul>				
32	Assertion: SN <sub>2</sub> reactions proceeds with retention of configuration.	1			
	Reason: SN <sub>2</sub> reactions proceed in a single step.				

	<ul> <li>a. Assertion and Reason are both correct and Reason is the correct explanation of Assertion.</li> <li>b. Assertion and Reason are both correct but Reason is not the correct explanation of Assertion.</li> <li>c. Assertion is correct but Reason is wrong.</li> <li>d. Assertion is wrong but Reason is correct.</li> </ul>	
33	<ul> <li>Assertion: Boiling points of alcohols are greater than ethers of same molecular mass.</li> <li>Reason: Ethers can form intermolecular hydrogen bonding with each other.</li> <li>a. Assertion and Reason are both correct and Reason is the correct explanation of Assertion.</li> <li>b. Assertion and Reason are both correct but Reason is not the correct explanation of Assertion.</li> <li>c. Assertion is correct but Reason is wrong.</li> <li>d. Assertion is wrong but Reason is correct.</li> </ul>	1
34	<ul> <li>Assertion: The melting points and solubility in water of amino acids are generally high and they behave like salts.</li> <li>Reason: In aqueous solution, the carboxyl group can lose a proton and amino group can accept a proton, giving rise to a dipolar ion known as zwitter ion.</li> <li>a. Assertion and Reason are both correct and Reason is the correct explanation of Assertion.</li> <li>b. Assertion and Reason are both correct but Reason is not the correct explanation of Assertion.</li> <li>c. Assertion is correct but Reason is wrong.</li> <li>d. Assertion is wrong but Reason is correct.</li> </ul>	1
35	<ul> <li>Assertion: The melting point of PH<sub>3</sub> is lower than NH<sub>3</sub> but higher than AsH<sub>3</sub>.</li> <li>Reason: The electronegativity of P is more than As but lesser than N.</li> <li>a. Assertion and Reason are both correct and Reason is the correct explanation of Assertion.</li> <li>b. Assertion and Reason are both correct but Reason is not the correct explanation of Assertion.</li> <li>c. Assertion is correct but Reason is wrong.</li> <li>d. Assertion is wrong but Reason is correct.</li> </ul>	1

#### ANSWER KEY

Q.NO	ANSWER	Q.NO	ANSWER	Q.NO	ANSWER
1	a	13	b	25	a
2	a	14	d	26	d
3	b	15	d	27	a
4	с	16	a	28	d
5	b	17	d	29	d
6	с	18	с	30	d
7	a	19	с	31	b
8	с	20	с	32	d
9	b	21	d	33	с
10	d	22	b	34	a
11	b	23	с	35	d
12	с	24	b		

# **CHECKED BY : HOD - SCIENCE**