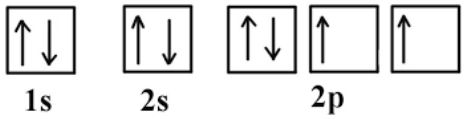
INDIAN SCHOOL AL WADI AL KABIR

ASSESSMENT I 2022-2023

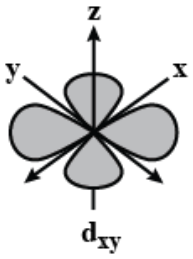
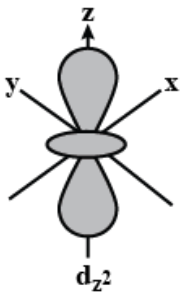
CLASS XI CHEMISTRY

MAX MARKS: 70

1.	a) 10 mol	1
2.	c) 2.05 %	1
3.	a) Mole fraction	1
4.	b) CH_2O	1
5.	d) Be^{3+} ion	1
6.	c) 10, 5	1
7.	b) Pairing of electrons does not take place until all the orbitals are singly occupied.	1
8.	c) 2	1
9.	b) Unniltrium Unt	1
10.	d) $(n\text{-}2)\, f^{1\text{-}14}\, (n\text{-}1)\, d^{0\text{–}1}\, ns^2$	1
11.	d) Assertion is wrong, but reason is correct statement.	1
12.	a) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.	1
13.	d) Assertion is wrong, but reason is correct statement.	1
14.	d) Assertion is wrong, but reason is correct statement.	1
15.	a) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.	1
16.	i) C ii) D iii) B iv) C v) c	1
17.	Mg is in excess	½ ½

	0.5 mole of Mg has only 0.125 mol of O2	1 ½
18.	Mole of NaOH = 0.1 Mole of H_2O = 2 Mole fraction of NaOH = 0.1/2.1 = 0.04 Molefraction of water = 0.96	½ ½ ½ ½
19.	The Law of Multiple Proportions states that "If two elements combine to form more than one compound between them, the mass ratios of the second element which combine with a fixed mass of the first element will always be the ratios of small whole numbers Valid example	1 1
20.	$\Delta x.\Delta p=h/4\pi$ Δx – change in position .Δp- change in momentum OR (i) Principal quantum number (ii) Magnetic quantum number	1 ½ x2 =1 1x2=2
21.	**Oxygen**  **1s** **2s** **2p** OR (i) [Ar] $3d^8$ $4s^2$ (ii) From 4s	2
22.	N=n−*l*−1 N=3−1−1=1	1 1
23.	Any two valid points of difference	1x2=2
24.	(a) Statement of Aufbau principle (b) N+l rule (c) Pauli's exclusion principle statement	1x3=3
25.	$\Delta x.\Delta p=h/4\pi$ Conversion of g into kg angstrom into m Δv= 0.527 x 10-23 m/s OR (i) 2p (ii) 2s (iii) 4f (iv) 4d (v) 4p (vi) 3d	½ 1 1 ½ ½ x 6 = 3
26.	(i) 1s2 2s2 2p6 3s2 3p6 3d5. – 5 unpaired electrons (ii) 1s2 2s2 2p6 3s2 3p6 3d5. – 5 unpaired electrons (iii) [Ar]3d4. – 4 unpaired electrons	(½ + ½) x3

27.	(i) B is the limiting reagent (ii) 4.5 moles	1.5 x 2=3
28.	Give any three valid differences	1x3=3
29.	Mass percent of Ca = (120310)×100 = 38.71% Mass percent of P = (62310)×100 = 20% Mass percent of O = (128310)×100 = 41.29% OR (i) Gay Lussacs law of combining volumes (ii) Statement (iii) 100 ml	1x3=3 1 1 1
30.	(i) C – group 16 D – group 1 (ii) C – period 3 D – period 4 (iii) C- p block D – s block	½ x 6= 3
31.	(a) Empirical formula – $C_5H_8O_2$ n=1 Molecular formula = $C_5H_8O_2$ (b) Molarity = mass % x10x Density/Molar mass = 49x10x9.8/98 = 49 M OR (a) 8 g (b) M=56 g	1 1 1 1 1 2.5 2.5
32.	(a) De Broglie wavelength = $6.6x10^{-32}$ m (b) The frequency of radiation absorbed or emitted when transition occurs between two stationary states that differ in energy by E, is given by (c) $\mathbf{v = \frac{\Delta E}{h} = \frac{E_2 - E_1}{h}}$ $\mathbf{angular\ momentum\ is\ mvr = \frac{nh}{2\pi}}$ $2\pi r = \frac{nh}{mv}$ **As λ= h/m v** $2\pi r = n\lambda$ **OR** **(a) λ= h/m v** **p=10^{22}** kgm/s	2 1 2 2

	(b) $\Delta E = 2.18 \times 10^{-18}$ J $\left[\frac{1}{4^2} - \frac{1}{2^2}\right]$ **ΔE = - 40.875 x 10^{-20} J** **$\nu = \Delta E/h$ = 40.875 x 10^{-20}/6.626 x 10^{-34}** **=6.16 x 10^{14}** s^{-1}	3
33.	(a) (i)  (iii)  (b) 9 (c) (i) last electron of Cl- (ii) 5d has more energy OR (a) The expression for the energy associated with nth orbit in hydrogen atom is En=−2.18 x 10^{-18}x1/$n^{2\ x1}$J/atom. The energy associated with fifth orbit is En =−2.18×10^{-18}/5^2J/atom=−8.68×10^{-20} J. (b) The radius of Bohr's nth orbit is given by the expression rn=0.0529x n^2 nm. For fifth orbit, the radius is r5=0.0529×5^2 nm=1.3225 nm. (c) 9 electrons	1x5

	(d) 16 orbitals	