B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL

TERM-1 EXAMINATION 2025-26
CHEMISTRY(043)

Class: XI ANSWER KEY Duration: 3 Hours
Date: /09/2025 Max. Marks:70
Admission no: Roll no:

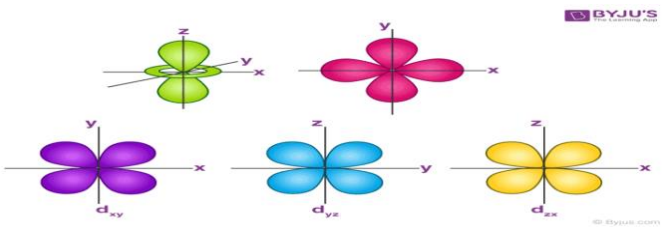
General Instructions:

(i) All questions are compulsory.
(ii) The question paper has five sections and 33 questions.
(iii) Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
(iv) There is no overall choice. Answer all 33 questions. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
(v) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION-A

Q. No. 1 to 12 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.

Q.no	Question	Marks
1.	(c) 1 g Li(s)	1
2.	(d)Both (a) and (b)	1
3.	(a) 4	1
4.	(c) 9	1
5.	(c)$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}4s^1$	1
6.	(b) Azimuthal quantum number	1
7.	(d) 7	1
8.	(d) S	1
9.	(d) C < N < F< O	1
10.	(a) Germanium	1
11.	(b) 120^0	1
12.	(c) 3,2	1
	Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below: A. Both A and R are true, and R is the correct explanation of A. B. Both A and R are true, and R is not the correct explanation of A. C. A is true but R is false. D. A is false but R is true.	

13.	A	1
14.	A	1
15.	A	1
16.	D	1
	SECTION-B	
17.	n/weight of solvent	2
18.	C10 H24 Fe	2
19.	Cloured hard catalyst alloys	2
20.	Head to head ,lateral, strong, weak	2
21.	Attempt either option A or B. A. Z=19 valency 1 unpaired 1 OR B. 2,8	2
	SECTION-C	
22.	(i) 44 g (ii)22 g (iii) 22 g.	3
23.	(a) n/V (b) n/ W (c) na/na+ nb	3
24.	Statement The principle is given by: $\Delta x \Delta p \geq h/4\pi$ The minimum uncertainty in the momentum of the electron is $5.27 \times 10^{-25} kgms^{-1}$	3
25.	 .	3
26.	Attempt A OR B Amount of energy required to remove the electron from isolated gaseous atom. Size stability OR C. Electronic configuration D. Stability and size	3
27.	Calculate formal charge (a) 0 +1 and -1 (b) 1s and 1s combuine together	3
28.		3

	(a) Bond order = Nb-Na/2 (b) Bond order = 0	
	SECTION-D	
29.	. (1+1+2) 1. 2s 2. a. n = 0 ,l = 0, m =0, s =+ 1/2 . n=0 not possible 3. Statement OR a. 2p b. 4s	4
30.	(a) B and C . 2 (b) p block are fixed but d block are variable 2 OR (b) Gr 17 they need only 1 electron	4
	SECTION-E	
31.	$3d^{10}4s^1$ $3d^{10}4s^2$ $3d^5 4s^2$ Account for Stability of half filled and completely filled subshells. **OR** Principal Quantum Number (n): • **Significance:** Determines the electron's energy level and the size of its orbital. Higher 'n' values indicate higher energy levels and larger orbitals, meaning the electron is farther from the nucleus. • **Examples:** n=1, 2, 3, ... correspond to the K, L, M, ... shells, respectively. Azimuthal (or Angular Momentum) Quantum Number (l): • **Significance:** Defines the shape of an electron's orbital and the subshell to which it belongs. • **Values:** Can range from 0 to n-1. l=0, 1, and 2 correspond to s, p, and d orbitals, respectively. • **Shapes:** s orbitals are spherical, p orbitals are dumbbell-shaped, and d orbitals have more complex shapes. Magnetic Quantum Number (ml): • **Significance:** Specifies the spatial orientation of an orbital in space and determines the number of orbitals within a subshell. **Values:** Can range from -l to +l, including 0. For example, if l=1 (p orbital), ml can be -1, 0, or +1, indicating three p orbitals oriented along different axes. Spin Quantum Number (ms): • **Significance:** Describes the intrinsic angular momentum of an electron, which is quantized and referred to as "spin." It indicates the direction of the electron's spin, either clockwise or counterclockwise. • **Values:** Only two possible values: +1/2 (spin-up) and -1/2 (spin-down)	5

32.	(i) ununnium (a) Li Na K (Increasing order of metallic character) (b) F Cl Br,(Increasing order of non-metallic character) (iii) 3rd pd 16th group (iv) N P As Sb Bi OR (a) Use the periodic table to answer the following questions. (i) C (ii) Ca Mg any (iii) O ,S any (b) Assign the position of the element having outer electronic configuration: (i) 2nd gr and 17 pd (ii) 3 rd group	5
33.	Hybridization in chemistry is the concept of mixing atomic orbitals to form new hybrid orbitals with different energy levels and shapes. These hybrid orbitals are then used in bonding. The three main types of hybridization involving s and p orbitals are sp, sp^2, and sp^3 1. **sp Hybridization:** • In this type, one s orbital and one p orbital of an atom mix to form two sp hybrid orbitals. • The two sp orbitals are oriented linearly, 180 degrees apart, resulting in a linear molecular geometry. • Example: Carbon dioxide (CO_2) where the carbon atom is sp hybridized. The molecule has a linear shape due to the sp hybridization of the carbon atom. 2. **2. sp^2 Hybridization:** • One s orbital and two p orbitals of an atom combine to create three sp^2 hybrid orbitals. • These sp^2 orbitals are arranged in a trigonal planar shape, with bond angles of 120 degrees. • Example: Boron trichloride (BCl_3). The boron atom in BCl_3 undergoes sp^2 hybridization, resulting in a trigonal planar geometry. 3. **3. sp^3 Hybridization:** • This involves the mixing of one s orbital and three p orbitals to produce four sp^3 hybrid orbitals. • These orbitals are directed towards the corners of a tetrahedron, with bond angles of approximately 109.5 degrees. • Example: Methane (CH_4). The carbon atom in methane is sp^3 hybridized, resulting in a tetrahedral molecular geometry. **OR** **(i) Tetra atomic polar molecule: Ammonia (NH3).** **(ii) Tetra atomic non-polar molecule: Phosphorus (P4).** **(iii) Molecule having six bond pairs: Sulfur hexafluoride (SF6).** **(iv) Shape of sp3d hybrid orbitals: Trigonal bipyramidal.** **(v) Shape of sp3d2 hybrid orbitals: Octahedral**	5

	(Vi) :O::O:	

**********All the best**********