CHEMISTRY MOCK TEST 2

➢ Instructions:

- Total Questions: 40
- Category I: 30 questions × 1 mark (–0.25 negative marking)
- Category II: 5 questions × 2 marks (–0.5 negative marking)
- Category III: 5 questions × 2 marks (no negative marking)
- Time Allowed: 1 hour
- Answer all questions.

➢ CATEGORY I

Q1: The correct bond order in the following species is:

- A) $O_2^{+2} < O_2^{-} < O_2^{+}$
- B) $O_2^{+} < O_2^{-} < O_2^{+2}$
- C) $O_2^{-} < O_2^{+} < O_2^{+2}$
- D) $O_2^{+2} < O_2^{+} < O_2^{-}$

Q2: OF and F2 can be compared in terms of:

- A) OF is more stable towards dissociation into atoms
- B) OF is paramagnetic while F2 is diamagnetic
- C) Both (a) and (b) are correct
- D) None of the above is correct

Q3: Which of the following possess net dipole moment?

- A) $BeCl_2$
- B) CO_2
- C) BF_3
- D) SO_2

Q4: Which of the following is the correct order of radius?

- A) $H^{-} > H > H^{+}$
- B) $Na^{+} > F^{-} > 0_2^{-}$
- C) $F^{-} > 0_2^{-} > Na^{+}$
- D) $A1^{3+} > Mg^{2+} > N^{3-}$

Q5: Among the isoelectronic ions (O^{2-}, N^{3-}, Mg^{2+}, Na^{+}), the ions with the least and the highest ionic radius are, respectively:

- A) Mg^{2+} , N^{3-}
- B) Mg^{2+} , O^{2-}
- C) Na^{+} , N^{3-}
- D) Na^{+} , O^{2-}

Q6: Which one of the following molecules is polar?

- A) XeF_4
- B) IF_5
- C) SbF_5
- D) CF_4

Q7: The covalent character of the following chlorides follow the order :

- A) HgCl2<CdCl2<ZnCl2
- B) ZnCl2<CdCl2<HgCl2
- C) CdCl2<ZnCl2<HgCl2
- D) HgCl2<ZnCl2<CdCl2

Q8: Identify the element having outer electronic configuration ns2np5 :

- A) Ar
- B) Te
- C) Ne
- D) I

Q9: Which from following is a CORRECT decreasing order of ionization enthalpies of different elements?

- A) Te>Po>S>Se
- B) Te>Po>Se>S
- C) S>Te>Po>Se
- D) S>Se>Te>Po

Q10: What is the number of unpaired electron(s) in the highest occupied molecular orbital of the following species: N2,N2+,O2,O2+?

- A) 0,1,0,1
- B) 2,1,2,1
- C) 0,1,2,1
- D) 2,1,0,1

Q11: Using MOT, compare O2+ and O2− species and choose the incorrect option:

- A) O2+ is diamagnetic while O2− is paramagnetic.
- B) O2− is less stable.
- C) Both O2+ and O2− is paramagnetic.
- D) O2+ have higher bond order than O2.

Q12: Which pair of elements with the given atomic numbers is expected to have similar properties?

- A) 40,72
- B) 20,36
- C) 10,28
- D) 11,12

Q13: The correct decreasing order of negative electron gain enthalpy for C, Ca, Al, F and O is:

- A) F>O>C>Al>Ca
- B) Ca>Al>O>F>C
- C) Al>F>Ca>C>O
- D) F>C>O>Ca>Al

Q14: Assertion: H2Se is less acidic than H2S.

Reason: S is less electronegative than Se:

- A) If both assertion and reason are true and reason is the correct explanation of assertion
- B) If both assertion and reason are true but reason is not the correct explanation of assertion
- C) If assertion is true but reason is false
- D) If both assertion and reason are false.

Q15: Select the incorrect statement about N_2 molecule:

- A) It is more stable than O_2 molecule.
- B) It consists more electrons in bonding molecular orbitals than O_2.
- C) Its bond order is 3.

- D)It is diamagnetic.

Q16: Which of the following pair contains 2 lone pair of electrons on the central atom?

- A) XeF_4, NH_3
- B) H_2O, NF_3
- C) I^{3+}, H_2O
- D) SO_4^{-2}, H_2S

Q17: Which of the following is the most basic oxide?

- A) SO_3
- B) SeO_3
- C) POO
- D) TeO

Q18: The atomic radius of gallium is less than that of aluminium. This is due to:

- A) Greater shielding power of s-electrons of gallium atom
- B) Poor shielding power of s-electrons of gallium
- C) Poor shielding power of d-electrons of gallium
- D) Greater shielding power of d-electrons of gallium

Q19: The correct sequence of increasing covalent character is represented by:

- A) LiCl<NaCl<BeCl2
- B) BeCl2<LiCl<NaCl
- C) NaCl < LiCl < BeCl2
- D) BeCl2 < NaCl < LiCl

Q20: What is the shape of bromine pentafluoride?

- A) Square pyramidal
- B) Trigonal pyramidal
- C) Square Planar
- D) Distorted Octahedral

Q21: Identify amphoteric oxide from following:

- A) BaO
- B) Li2O
- C) BeO
- D) MgO

Q22: Which from following species does not have number of electrons similar to other three species?

- A) Na+
- B) O_2-
- C) Ne
- D) Na

Q23: The boiling point of the water is higher than liquid HF. The reason is that:

- A) Hydrogen bonds are stronger in water
- B) Hydrogen bonds are stronger in HF
- C) Hydrogen bonds are larger in number in HF
- D) Hydrogen bonds are larger in number in water

Q24: The interaction energy of London forces between two particles is proportional to r where r is the distance between the particles. The value of x is:

- A) 3
- B) -6
- C) -3
- D) 6

Q25: Identify the bond order of NO+ ion :

- A) 1
- B) 2
- C) 3
- D) 4

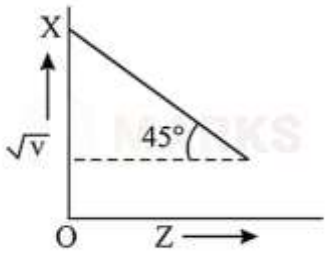
Q26: Which group elements from following are called as chalcogens?

- A) Grp 17
- B) Grp 13
- C) Grp 16
- D) Grp 15

Q27: The correct order of increasing C- O bond length CO, CO_3^{2-}, CO_2 is:

- A) $CO<CO_2<CO_3^{2-}$
- B) $CO_2<CO_3^{2-}<CO$
- C) $CO<CO_3^{2-}<CO_2$
- D) $CO_3^{2-}<CO_2<CO$

Q28: In the graph between √v and Z for the Mosley' equation, √v = a(Z - b), the intercept OX is 1 on √v axis



What is the frequency v when the atomic number Z is 52?

- A) 7.14 s^{-1}
- B) 7 s^{-1}
- C) 2401 s^{-1}
- D) 2601 s^{-1}

Q29: Match the atomic numbers of the elements given in column I with the periods given in column II and mark the appropriate choice.

Column I (Atomic number)	Column II (I
(p) 31	(i) 5
(q) 50	(ii) 3
(r) 56	(iii) 4
(s) 14	(iv) 6

A (p)-(i), (q)-(ii), (r)-(iii), (s)-(iv)

B (p)-(ii), (q)-(i), (r)-(iv), (s)-(iii)

C (p)-(iii), (q)-(iv), (r)-(i), (s)-(ii)

D (p)-(iii), (q)-(i), (r)-(iv), (s)-(ii)

Q30: The ionic radius of Na+ ions is 1.02 A . The ionic radii (in A) of Mg^{2+} and Al^{3+} respectively are :

- A) 0.68 and 0.72
- B) 1.05 and 0.99

- C) 0.72 and 0.54
- D) 0.85 and 0.99

➢ CATEGORY II

Q1: Which of the following has least bond energy?

- A) N_2^{2-}
- B) N_2
- C) N_2^+
- D) N_2

Q2: Suppose a gaseous mixture of He, Ne, Ar and Kr is treated with photons of the frequency appropriate to ionize Ar. What ion(s) will be present in the mixture?

- A) $Ar^+ + Kr$
- B) $Ar^+ + He^+ + Ne^+$
- C) $He^+ + Ar^+ + Kr^+$
- D) Ar^+

Q3: Identify the correct statements from the following.

(1) The dipole moment of CO2 and BF3 is zero.

(2) The dipole moment of NF3 is higher than the dipole moment of NH3.

(3) The dipole moment of HI is lower than the dipole moment of HCI:

- A) 1,3
- B) 1,2
- C) 2,3
- D) 1,2,3

Q4:

Match List I with List II

	List-I		List-II
	(Molecule)		(Shape)
A.	NH_3	I.	Square pyramid
B.	BrF_5	II.	Tetrahedral
C.	PCl_5	III.	Trigonal pyramic
D.	CH_4	IV.	Trigonal bipyram

Choose the correct answer from the options given below:

A A-II, B-IV, C-I, D-III

B A-III, B-IV, C-I, D-II

C A-III, B-I, C-IV, D-II

D A-IV, B-III, C-I, D-II

Q5:

Column I	Column II
A. He	i. Highest electron gain enthalpy
B. Cl	ii. Most electropositive element
C. Ca	iii. Strongest reducing agent
D. Li	iv. Highest ionisation energy

The correct match of the contents in column I with those in column II is

A. A-(iii), B-(i), C-(ii), D-(iv)

B. A-(iv), B-(iii), C-(ii), D-(i)

C. A-(i), B-(ii), C-(iii), D-(iv)

D. A-(iv), B-(i), C-(ii), D-(iii)

➢ CATEGORY III

Q1:

$XeF_2, NO_2, HCN, ClO_2, CO_2$.
Identify the non-linear molecule-pair from the above mentioned molecules.

A CO_2, NO_2

B HCN, NO_2

C XeF_2, ClO_2

D ClO_2, NO_2

Q2: Which of the following statements about the periodic table are correct?

- A) Elements in the same group have the same no of valence electrons.
- B) Atomic radius increases from left to right across a period.
- C) Ionization energy generally increases across a period.
- D) Metallic character decreases across a period.

Q3: The IUPAC name of compound with atomic no 101 is:

- A) Mendelevium.
- B) Unditrium.
- C) Unnilbium.
- D) Unnilunium.

Q4: Which of the following compounds have central atom with hybridization involving d orbitals?

- A) BF_3.
- B) NH_4^+.
- C) PCl_5.
- D) XeF_4.

Q5: Which of the following statements are correct regarding N_2, O_2, N_2^+ and B_2?

- A) O_2 and B_2 are paramagnetic in nature.
- B) Bond order of N_2^+ is greater than N_2.
- C) Bond order of N_2 is greater than O_2.
- D) O_2 is diamagnetic in nature.