

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

Subject Code :

0 8

Test Booklet No. : 00852

TEST BOOKLET

CHEMISTRY

Time Allowed : 2 (Two) Hours

Full Marks : 200

INSTRUCTIONS

1. The name of the Subject, Roll Number as mentioned in the Admission Certificate, Test Booklet No. and Subject Code shall be written legibly and correctly in the space provided on the Answer Sheet with black ball pen.
2. **Space provided for Series in the Answer Sheet is not applicable for Optional Subject. So the space shall be left blank.**
3. All questions carry equal marks. Your total marks will depend only on the number of correct responses marked by you in the Answer Sheet.
4. No candidate shall be admitted to the Examination Hall/Room 20 minutes after commencement of distribution of the paper. The Supervisor of the Examination Hall/Room will be the time-keeper and his/her decision in this regard is final.
5. No candidate shall leave the Examination Hall/Room without prior permission of the Supervisor/Invigilator. No candidate shall be permitted to hand over his/her Answer Sheet and leave the Examination Hall/Room before expiry of the full time allotted for each paper.
6. No Mobile Phone, Pager, etc., are allowed to be carried inside the Examination Hall/Room by the candidates. Any Mobile Phone, Pager, etc., found in possession of the candidate inside the Examination Hall/Room, even if on off mode, shall be liable for confiscation.
7. No candidate shall have in his/her possession inside the Examination Hall/Room any book, notebook or loose paper, except his/her Admission Certificate and other connected paper permitted by the Commission.
8. Complete silence must be observed in the Examination Hall/Room. No candidate shall copy from the paper of any other candidate, or permit his/her own paper to be copied, or give, or attempt to give, or obtain, or attempt to obtain irregular assistance of any kind.
9. After you have completed filling in all your responses on the Answer Sheet and the Examination has concluded, you should hand over to the Invigilator *only the Answer Sheet*. You are permitted to take away with you the Test Booklet.
10. Violation of any of the above Rules will render the candidate liable to expulsion from the Examination Hall/Room and disqualification from the Examination, and according to the nature and gravity of his/her offence, he/she may be debarred from future Examinations and Interviews conducted by the Commission for appointment to Government Service.
11. Smoking inside the Examination Hall/Room is strictly prohibited.
12. **This Test Booklet contains one page for Rough Work at the end.**

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[No. of Questions : 100]

SEAL

KTM-08-XV

1. The element with atomic number 54 exists in which group of the periodic table?

- (A) Group 18
- (B) Group 1
- (C) Group 9
- (D) Group 4

2. Be and Al exhibit some similarity in chemical behaviour. This is because

- (A) they belong to the same group of the periodic table
- (B) they show diagonal relationship
- (C) they belong to the same period of the periodic table
- (D) they are transitional elements

3. Which among the following metal ions exhibits the highest magnetic moment?

- (A) Cr^{3+}
- (B) Fe^{3+}
- (C) Cu^{2+}
- (D) Sc^{3+}

4. The four quantum numbers of the two electrons of He atom are

	n	l	m_l	s
Electron-1	1	0	0	$+\frac{1}{2}$
Electron-2	1	0	0	$-\frac{1}{2}$

The difference of the quantum numbers of the two electrons of He atom is due to

- (A) Aufbau principle
- (B) Bohr's atomic model
- (C) Pauli's exclusion principle
- (D) Heisenberg's uncertainty principle

5. Which one of the following is in the correct increasing order of electron affinity?

- (A) $\text{F} < \text{N} < \text{O} < \text{Li}$
- (B) $\text{Mg} < \text{Ca} < \text{Sr} < \text{Ba}$
- (C) $\text{I} < \text{Br} < \text{F} < \text{Cl}$
- (D) $\text{Li} < \text{Na} < \text{K} < \text{Cs}$

6. Which one of the following is the least electronegative element?

- (A) Chlorine
- (B) Oxygen
- (C) Fluorine
- (D) Sodium

7. Which one of the following has the highest value of ionic radius?

- (A) S^{2-}
- (B) Cl^-
- (C) Al^{3+}
- (D) Na^+

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8. The first ionization potential of an element X is 10.5 eV. The value of electron gain enthalpy of X^+ ion would be
- (A) +21.0 eV
 (B) -21.0 eV
 (C) -10.5 eV
 (D) -31.5 eV
9. Which of the following elements belong to the same group of the periodic table?
- (A) Atomic numbers = 3, 10, 19, 37
 (B) Atomic numbers = 4, 20, 38, 56
 (C) Atomic numbers = 2, 10, 17, 36
 (D) Atomic numbers = 9, 16, 34, 35
10. In which of the following molecules all the bonds are not equal?
- (A) BF_3
 (B) SF_6
 (C) CH_4
 (D) BrF_3
11. Which among the following is the correct increasing trend of bond order?
- (A) $O_2^{2-} < O_2^- < O_2 < O_2^+$
 (B) $O_2^+ < O_2 < O_2^- < O_2^{2-}$
 (C) $O_2^- < O_2^{2-} < O_2^+ < O_2$
 (D) $O_2^{2-} < O_2 < O_2^+ < O_2^-$
12. The total number and types of bonds in acetylene molecule are
- (A) one sigma and one pi
 (B) two sigma and two pi
 (C) three sigma and one pi
 (D) three sigma and two pi
13. Which one of the following is not isostructural with CCl_4 ?
- (A) NH_4^+
 (B) CH_4
 (C) SF_4
 (D) CH_3Cl
14. Which one of the following represents correctly the increasing order of C—O bond length for carbonate anion, carbon monoxide and carbon dioxide?
- (A) $CO < CO_3^{2-} < CO_2$
 (B) $CO_3^{2-} < CO < CO_2$
 (C) $CO < CO_2 < CO_3^{2-}$
 (D) $CO_3^{2-} < CO_2 < CO$
15. In a regular trigonal bipyramidal MX_5 structure, the number of X—M—X bonds at 180° angle is
- (A) one
 (B) two
 (C) three
 (D) five

16. Which one of the following has the smallest bond angle?
- (A) NH_3
 (B) CH_3^+
 (C) SbH_3
 (D) CO_2
17. Which one of the following possesses the highest number of lone pairs of electrons around the central atom?
- (A) OF_2
 (B) H_2O
 (C) XeF_4
 (D) I_3
18. Which one of the following molecules has the highest dipole moment?
- (A) BF_3
 (B) CO_2
 (C) NF_3
 (D) NH_3
19. Which one of the following molecules has a T-shaped structure?
- (A) ClF_3
 (B) BrF_3
 (C) NH_3
 (D) CH_4
20. When CaCO_3 is heated, CO_2 is given off. In metallurgical operation, this process is termed as
- (A) smelting
 (B) roasting
 (C) calcination
 (D) reduction
21. Which one of the following is an ore of copper?
- (A) Calamine
 (B) Malachite
 (C) Bauxite
 (D) Magnetite
22. Which one among the following is an alloy of copper?
- (A) German silver
 (B) Duralumin
 (C) Stainless steel
 (D) Magnalium
23. Which one of the following molecules has the sp^2 hybridization of the central atom?
- (A) CH_4
 (B) BF_3
 (C) NH_3
 (D) C_2H_2

