CHEMISTRY **Max.Marks:80**

SECTION-1

(SINGLE CORRECT CHOICE TYPE)

Section-I (Single Correct Answer Type, Total Marks: 24) contains 8 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct.** For each question you will be awarded 3 marks if you darken ONLY the bubble corresponding to the correct answer and zero marks if no bubble is darkened. In all other cases, minus one (-1) mark will be awarded.

1. Conc. H_2SO_4 in absence of water can liberate hydrogen by reaction with

A) Cu B) Ag C) Zn D) None of the above

2. In which of the following oxo anion the difference in oxidation state of two different kinds of sulphur atoms is eight?

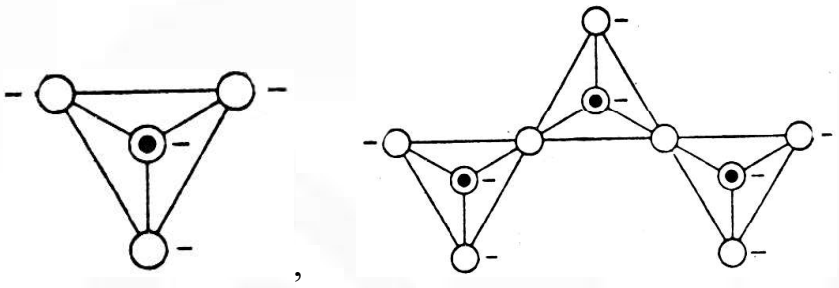
A) $S_2O_3^{-2}$ B) $S_2O_6^{-2}$ C) $S_4O_6^{-2}$ D) $S_3O_6^{-2}$

3. Which of the given oxides of nitrogen has equal number of lone pairs:

A) NO_2, N_2O_3 (symmetrical form) B) NO_2, N_2O_3 (asymmetrical form)

C) NO_2, N_2O_4 D) $\underset{(symmetrical\ form)}{N_2O_3}$, $\underset{(asymmetrical\ form)}{N_2O_3}$

4. The correct set of formulae of the silicates represented by the following structure is



A) $SiO_3^{-2}, Si_2O_7^{-2}$ B) $SiO_4^{-4}, Si_3O_{10}^{-8}$ C) SiO_4, Si_3O_{10} D) $SiO_3^{-4}, Si_3O_9^{-8}$

5. $\underset{(solu)}{FeCl_3} + \underset{(solu)}{Na_2S_2O_3} \rightarrow \underset{dark\ violet}{Fe_2(S_2O_3)_3} + NaCl \xrightarrow{On\ standing} Fe^{2+}(green) + X(anion)$

The difference in oxidation states of different kinds of sulphur atom of X is

A) Zero B) 5 C) 4 D) 3

6. The incorrect statement regarding the following compounds is

i) NF_3 ii) SiF_4 iii) CF_4 iv) SF_6

A) (ii) under goes partial hydrolysis

B) (i), (iii), (iv) can't undergo hydrolysis

C) (i) to (iv) are non planar halides

D) (ii) under goes complete hydrolysis

7. $CH_2(COOH)_2 \xrightarrow[150^\circ C]{P_4O_{10}} X + H_2O$

The number of carbon atoms in 'X' with sp^2 hybridization is

A) 2 B) 3 C) zero D) 1

8. Given $PF_5, PCl_5, PBr_5, SiCl_4, CCl_4$

The number of halides with unequal bond lengths in gaseous state is

A) 2 B) 3 C) 4 D) 5

SECTION-2
(MORE THAN ONE TYPE)

Section - II (Multiple Correct Answers Type, Total Marks: 16) contains 4 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONE or MORE may be correct. For each question you will be awarded 4 marks if you darken ALL the bubble(s) corresponding to the correct answer(s) ONLY and zero marks otherwise. There are no negative marks in this section.

9. NO_2 has odd number of electrons, it tends to dimerize forming colourless diamagnetic N_2O_4.

$$\underset{\text{Brown}}{NO_2} + NO_2 \rightleftharpoons \underset{\text{Colourless}}{O_2N - NO_2}$$

Identify the correct statement(s)

A) In gas phase, NO_2 and N_2O_4 are present in equilibrium as dimer formation is exothermic

B) colour of the mixture fades on heating

C) colour of the mixture darkens on cooling

D) NO_2 can be obtained by exposing N_2O to air

10. Choose incorrect statement(s)

A) Hypophosphorous acid, Phosphorous acid, and phosphoric acid have same number of unprotanated oxygen atoms.

B) In thiosulphuric acid both the sulphur atoms have same oxidation state

C) Among hypophosphorous, phosphorous and phosphoric acids, phosphoric acid is more acidic due to higher oxidation state of phosphorus

D) Hypophosphoric acid have P-O-P bond

11. Correct statement(s) regarding (I) SO_2, (II) SO_3 (III) CO_2 is/are

A) Hybridisation of central atom in compounds (I) to (III) is sp^2

B) The number of lone pairs of electrons on 'S' of (II) and carbon of (III) together is one

C) Among (I) (II) and (III), (II) is more acidic

D) Among (I) (II) and (III), (I) is more reducing

12. Which of the following compound can act as bleaching agent under dry conditions ?

A) O_3 B) SO_2 C) Cl_2 D) O_2

SECTION-3
[INTEGER TYPE]

Section-III (Integer Answer Type, Total Marks: 24) contains 6 questions. The answer to each of the questions is a single-digit integer, ranging from 0 to 9. The bubble corresponding to the correct answer is to be darkened in the ORS. For each question you will be awarded 4 marks if you darken ONLY the bubble corresponding to the correct answer and zero marks otherwise. There are no negative marks in this section.

13. Among Quartz , cristabolite, tridymite, jaspar, onyx, the number of crystalline forms of SiO_2 is

14. $2Na_2HPO_4(s) + NaH_2PO_4(s) \xrightarrow{\Delta} X(s) + 2H_2O(s)$

'X' can acts as water softner. The number of P-O-P bonds in X is _____

15. The number of P-H bonds in hypophosphoric acid is _____

16. How many of the following reduce conc. H_2SO_4 to SO_2?

$Cu, S, C, KCl, KF, KBr, KI$

17. How many the following forms phosphonium salt with PH_3?

$aq.HCl$, $aq.HBr$, $aq.HI$

18. The number of unprotonated oxygen atom in $H_2S_2O_5$ is…….

SECTION-4
[Matrix Matching Type]

Section-IV (Matrix-Match Type, Total Marks: 16) contains 2 questions. Each question has four statements (A, B, C and D) given in Column I and five statements (p, q, r, s and t) in Column II. Any given statement in Column I can have correct matching with ONE or MORE statement(s) given in Column II. For example, if for a given question, statement B matches with the statements given in q and r, then for the particular question, against statement B, darken the bubbles corresponding to q and r in the ORS. For each question you will be awarded 2 marks for each row in which you have darkened ALL the bubble(s) corresponding to the correct answer(s) ONLY and zero marks otherwise. Thus, each question in this section carries a maximum of 8 marks. There are no negative marks in this section.

19. Match each of the reactions given in column-I with the corresponding product(s) given Column-II

COLUMN-I	**COLUMN-II**
A) $Zn + dil.HNO_3$	P) Metal nitrate
B) $Sn + dil.HNO_3$	Q) NO
C) $Ag + dil.HNO_3$	R) NO_2
D) $Cu + conc.HNO_3$	S) NH_4NO_3
	T) N_2O

20. Match column-I with Column-II

COLUMN-I	**COLUMN-II**
A) $H_2S_2O_3$	P) Dibasic
B) $H_2S_2O_6$	Q) Has covalent bond between sulphur atoms
C) $H_2S_2O_7$	R) Has at least one sulphur atom in +5 oxidation state
D) H_2SO_4	S) Has at least one sulphur atom in +6 oxidation state
	T) Has at least one sulphur atom in -2 oxidation state