

*** Choose The Right Answer From The Given Options.[1 Marks Each]**

[81]

1. The oxidation number of carbon in CH_2Cl_2 is
(A) 0 (B) 2 (C) 3 (D) 5
2. The ratio of oxygen atom having -2 and -1 oxidation numbers in $\text{S}_2\text{O}_8^{2-}$ is _____.
(A) 1 (B) 2 (C) 3 (D) 4
3. Which are of the following can act as oxidising as well reducing agent?
(A) H_2 (B) I_2
(C) H_2O_2 (D) All of these
4. Oxidation number of Cl in CaOCl_2 is _____.
(A) -1 and $+1$ (B) $+2$
(C) -2 (D) None of these
5. The oxidation state of C in diamond is:
(A) 0 (B) $+1$ (C) -1 (D) $+2$
6. The oxidation number of sulphur in S_8 , S_2F_2 and H_2S respectively are _____.
(A) 0, $+1$ and -2 (B) $+2$, $+1$ and -2
(C) 0, $+1$ and $+2$ (D) -2 , $+1$ and -2
7. Identify the correct statements with reference to the given reaction:

$$\text{P}_4 + 3\text{OH}^- + 3\text{H}_2\text{O} \longrightarrow \text{PH}_3 + 3\text{H}_2\text{PO}_2^-$$

(A) Phosphorus is undergoing reduction only.
(B) Phosphorus is undergoing oxidation only.
(C) Phosphorus is undergoing oxidation as well as reduction.
(D) Hydrogen is undergoing neither oxidation nor reduction.
8. In the balanced chemical equation:

$$\text{IO}_3 + a\text{I}^- + b\text{H}^+ \longrightarrow c\text{H}_2\text{O} + d\text{I}_2$$

a, b, c, d respectively are:
(A) 5, 6, 3, 3 (B) 5, 3, 6, 3 (C) 3, 5, 3, 6 (D) 5, 6, 5, 5
9. $\text{H}_2\text{SO}_5 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4 + \text{H}_2\text{O}_2$

Oxidation number of sulphur in H_2SO_5 in the above reaction is:
(A) 6 (B) 4 (C) 5 (D) 2
10. Which of the following arrangements represent increasing oxidation number of the central atom?
(A) CrO_2^- , ClO_3^- , CrO_4^{2-} , MnO_4^- (B) ClO_3^- , CrO_4^{2-} , MnO_4^- , CrO_2^-
(C) CrO_2^- , ClO_3^- , MnO_4^- , CrO_4^{2-} (D) CrO_4^{2-} , MnO_4^- , CrO_2^- , ClO_3^-
11. The lowest possible oxidation state of nitrogen is -3 as in N^{3-} .
(A) True (B) False

- (C) Ambiguous (D) None of these
12. It is found that V forms a double salt isomorphous with Mohr's salt. The oxidation number of V in this compound is _____.
 (A) 3 (B) +2 (C) +4 (D) -4
13. From the given species such as Li, K, Ca and Na, which of the following is the strongest reducing agent?
 (A) Na (B) Li (C) Ca (D) K
14. In FeCr_2O_4 the oxidation numbers of Fe and Cr are:
 (A) +2 and +3 (B) 0 and +2
 (C) +2 and +6 (D) +3 and +6
15. In the reaction, $2\text{Na}_2\text{S}_2\text{O}_3 + \text{I}_2 \rightarrow \text{Na}_2\text{S}_4\text{O}_6 + 2\text{NaI}$, I_2 acts as:
 (A) Oxidising agent. (B) Reducing agent.
 (C) Oxidising as well as reducing agent. (D) None of the above.
16. Choose the correct explanation regarding half-reaction such as $\text{Cr}_2\text{O}_7^{2-} \longrightarrow \text{Cr}^{3+}$ from the following.
 (A) It is oxidation half-reaction.
 (B) Chromium being oxidized.
 (C) $\text{Cr}_2\text{O}_7^{2-}$ is a good reducing agent.
 (D) Chromium being reduced.
17. Number of moles of MnO_4^- required to oxidise one mole of ferrous oxalate completely in acidic medium will be:
 (A) 0.6 moles. (B) 0.4 moles.
 (C) 7.5 moles. (D) 0.2 moles.
18. Which one of the following substances is a good oxidising agent?
 (A) Coke. (B) Water.
 (C) Hydrogen peroxide. (D) Sulphur dioxide.
19. Find the oxidation number of V in $\text{Rb}_4\text{Na}[\text{HV}_{10}\text{O}_{28}]$.
 (A) +5 (B) +2
 (C) -5 (D) None of these
20. If a reaction is carried out in acidic medium then which is used to balance the equation?
 (A) H^+ ions. (B) OH^- ions. (C) H^- ions. (D) O^{2-} ions.
21. Oxidation number of S in $\text{S}_2\text{O}_3^{2-}$ is:
 (A) -2 (B) +2 (C) +6 (D) 0
22. Oxidation state of Fe in Sodium Nitroprusside is:
 (A) +3 (B) +4 (C) +2 (D) +1
23. $x\text{KMnO}_4 + \text{NH}_3 \longrightarrow y\text{KNO}_3 + \text{MnO}_3 + \text{KOH} + \text{H}_2\text{O}$
 (A) $x = 4, y = 6$ (B) $x = 8, y = 6$
 (C) $x = 3, y = 8$ (D) $x = 8, y = 3$
24. Consider the following chemical reaction
 $\text{MnO}_4^-(\text{aq}) + \text{I}^-(\text{aq}) \longrightarrow \text{MnO}_2(\text{s}) + \text{I}_2(\text{s})$

Which of the following reactions is an oxidation half-reaction?

- (A) $\text{MnO}_4^- (\text{aq}) \longrightarrow \text{MnO}_2 (\text{s})$ (B) $\text{I}^- (\text{aq}) \rightarrow \text{I}_2 (\text{s})$.
(C) Both (a) and (b).
(D) None of the above.

25. The oxidation number of Phosphorus in $\text{Mg}_2\text{P}_2\text{O}_7$ is:

- (A) +3 (B) 2 (C) +5 (D) -3

26. A mole of N_2H_4 loses 10 mol of electrons to form a new compound Y. Assuming that all the nitrogen appears in the new compound, what is the oxidation state of nitrogen in Y ? (There is no change in the oxidation number of hydrogen).

- (A) -1 (B) -3 (C) +3 (D) +5

27. Oxidation state of nitrogen is not an integer in:

- (A) Hydroxyl amine (NH_2OH) (B) Ammonia (NH_3)
(C) Hydrazine (N_2H_4) (D) Hydrazoic acid (N_3H)

28. $? + \text{O}_2 \rightarrow 2\text{K}_2\text{O}$

- (A) K (B) K_2 (C) 2K (D) 4K

29. The brown ring complex compound is formulated as $[\text{Fe}(\text{H}_2\text{O})_5(\text{NO})]\text{SO}_4$. The oxidation state of iron in this complex is:

- (A) 0 (B) +1 (C) +2 (D) +3

30. The oxidation state of oxygen is maximum in _____.

- (A) Bleaching powder (CaOCl_2) (B) Oxygen difluoride (OF_2)
(C) Dioxygen difluoride (O_2F_2) (D) Hydrogen peroxide (H_2O_2)

31. The oxidation number of cobalt in $\text{K}[\text{Co}(\text{CO})_4]$ is:

- (A) -1 (B) -3 (C) +1 (D) +3

32. Which of the following processes does not involve oxidation of iron?

- (A) Rusting of iron sheets
(B) Decolourisation of blue CuSO_4 solution by Fe.
(C) Formation of $\text{Fe}(\text{CO})_5$ from Fe.
(D) Liberation of H_2 from steam by iron at high temperature.

33. The value of n in the molecular formula $\text{Be}_n\text{Al}_2\text{Si}_6\text{O}_{18}$ is:

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

34. In the reaction between copper nitrate solution and zinc, copper ions are reduced by gaining electrons from:

- (A) Copper. (B) Nitrogen. (C) Zinc. (D) Oxygen.

35. When ammonium nitrate is gently heated, an oxide of nitrogen is formed. What is the oxidation state of nitrogen in this oxide?

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

36. An element if present in the free or the uncombined state, its each atom bears an oxidation number:

- (A) More than 1 (B) Less than 1
(C) More than 2 (D) Zero.

37. The oxidation number of P in $\text{Na}_4\text{P}_2\text{O}_7$ is:

- (A) +3 (B) +2 (C) +5 (D) -3

38. The average oxidation number of iodine in I_3^- ion is:
 (A) -1 (B) $-\frac{1}{3}$ (C) $+1$ (D) $+\frac{1}{3}$
39. Oxidation number of sulphur in marshall's acid ($H_2S_2O_8$) is:
 (A) $+5$ (B) $+8$ (C) $+6$ (D) $+7$
40. E^\ominus values of some redox couples are given below. On the basis of these values choose the correct option:
 E^\ominus values : $Br_2 / Br^- = +1.90$; $Ag^+ / Ag(S) = +0.80$
 $Cu^{2+} / Cu(s) = +0.34$; $I_2(s) / I^- = 0.54$
 (A) *Cu* will reduce *Br*⁻ (B) Cu will reduce Ag
 (C) Cu will reduce I⁻
 (D) Cu will reduce Br₂
41. Oxidation number of C in HCCOH is _____.
 (A) $+2$ (B) $+4$ (C) $+3$ (D) 0
42. One mole of N_2H_4 loses 10 moles of electrons to form a new compound A. Assuming that all the nitrogen appears in the new compound, what is the oxidation state of nitrogen in A?
 [There is no change in the oxidation state of hydrogen]
 (A) $+1$ (B) -3 (C) $+3$ (D) $+5$
43. The oxidation number of Mn in potassium permanganate is:
 (A) $+6$ (B) $+7$ (C) $+5$ (D) $+8$
44. On reduction of $KMnO_4$ by oxalic acid in acidic medium, the oxidation number of Mn changes. What is the magnitude of this change?
 (A) 7 to 2 (B) 6 to 2 (C) 5 to 2 (D) 7 to 4
45. The more positive the value of E^\ominus , the greater is the tendency of the species to get reduced. Using the standard electrode potential of redox couples given below find out which of the following is the strongest oxidising agent:
 E^\ominus values: $Fe^{3+} / Fe^{2+} = +0.77$; $I_2(S) / I^- = +0.54$;
 $Cu^{2+} / Cu = +0.34$; $Ag^+ / Ag = +0.80V$
 (A) Fe^{3+} (B) $I_2(S)$ (C) Cu^{2+} (D) Ag^+
46. What is the oxidation number of chlorine in ClO_3^- ?
 (A) $+5$ (B) $+3$ (C) $+4$ (D) $+2$
47. Solution of potassium chloride or ammonium nitrate in salt-bridge usually solidified by boiling with:
 (A) Agar-agar. (B) Starch. (C) Cellulose. (D) Glycogen.
48. In the reaction, $2KClO_3 \rightarrow 2KCl + 3O_2$, the elements which have been oxidised and reduced respectively are:
 (A) Chlorine and oxygen. (B) Oxygen and chlorine.
 (C) Potassium and oxygen. (D) Oxygen and potassium.
49. What is the oxidation number of Br in the compound $RbBrO_4$?
 (A) -1 (B) $+7$ (C) $+1$ (D) $+4$
- 50.

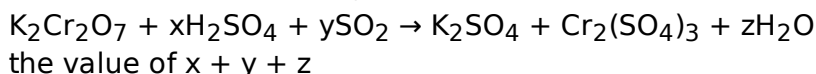
When tin(IV) chloride is treated with excess of conc. hydrochloric acid, the complex ion $(\text{SnCl}_6)^{2-}$ is formed. The oxidation state of tin in this complex ion is?

- (A) +4 (B) zero (C) -2 (D) -4

51. Which of the following compounds we use in our laboratory as a standard solution (titrant) ?

- (A) KMnO_4 (B) $\text{K}_2\text{Cr}_2\text{O}_7$
(C) $\text{Na}_2\text{S}_2\text{O}_3$ (D) All of these

52. In the chemical reaction,



- (A) 6 (B) 5 (C) 7 (D) 3

53. The difference in the oxidation numbers of the two types of sulphur atoms in $\text{Na}_2\text{S}_4\text{O}_6$ is:

- (A) 5 (B) 4 (C) 3 (D) 6

54. What is the oxidation number of Si in the compound CaSiO_3 ?

- (A) -4 (B) +2 (C) -2 (D) +4

55. Standard reduction potential of X, Y, Z are -1.2v, +0.5v, -3.0v respectively, the reducing power of the metals will be:

- (A) $Y > Z > X$ (B) $Y > X > Z$
(C) $Z > X > Y$ (D) $X > Y > Z$

56. When P reacts with caustic soda, the products are PH_3 and NaH_2PO_2 . The reaction is an example of.

- (A) Oxidation. (B) Reduction.
(C) Both oxidation and reduction. (D) Neutralisation.

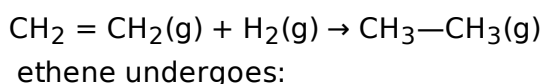
57. The oxidation state of the most electronegative element in the products of the reaction between BaO_2 and H_2SO_4 are:

- (A) 0 and -1 (B) +1 and -2
(C) -2 and 0 (D) -2 and +1

58. Tailing of mercury is _____ redox change.

- (A) Intramolecular. (B) Intermolecular.
(C) Disproportion. (D) None.

59. In the given reaction,



- (A) Reduction process. (B) Oxidation process.
(C) Addition process. (D) All of these.

60. The oxidation state of Cr in $\text{K}_2\text{Cr}_2\text{O}_7$ is:

- (A) +4 (B) +3 (C) +6 (D) +5

61. In MgCl_2 , the oxidation number of chlorine is:

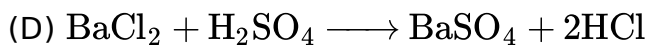
- (A) +1 (B) +2 (C) -1 (D) 0

62. The sum of oxidation number of all the atoms in a neutral molecule must be zero.

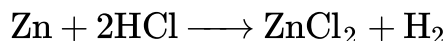
- (A) True. (B) False.
(C) Ambiguous. (D) None of these.

KULDEEP VERMA SIR (B) $Y > X > Z$ 2701166
K.D. EDUCATION ACADEMY
 One Day Day-1 9th & 10th MATHS, SCIENCE & S.S.T
 11th & 12th MATHS, PHYSICS, CHEMISTRY (by K.D. Sir)
 BIOLOGY, HISTORY, GEO. POLITY, GEOGRAPHY
 IIT-JEE, NEET, NDA, CUET
 नोट : K.D. SIR की अर्जी है आगे आपकी मर्जी है !
 Add- Gali No- 21, A-1 Block Near Gupta Har (B) 110084
 5 YEARS TEACHING EXP.

63. The oxidation number of chromium in CrO_5 is:
 (A) +6 (B) +5 (C) +10 (D) 0
64. Oxidation state of nitrogen in NH_2OH is:
 (A) -3 (B) -1 (C) +2 (D) 3
65. Oxygen has an oxidation state of +2 in.
 (A) H_2O_2 (B) OF_2 (C) SO_2 (D) H_2O
66. The oxidation numbers of sulphur in S_8 , S_2F_2 and F_2S respectively, are:
 (A) 0, +1 and -2 (B) +2, +1 and -2
 (C) 0, +1 and +2 (D) -2, +1 and -2
67. In which of the following compounds, is the oxidation number of sulphur is the least?
 (A) SO_2 (B) SO_3 (C) $\text{Na}_2\text{S}_4\text{O}_8$ (D) H_2SO_4
68. The oxidation numbers of the sulphur atoms in peroxy monosulphuric acid (H_2SO_5) and peroxydisulphuric and ($\text{H}_2\text{S}_2\text{O}_8$) are respectively.
 (A) +8 and +7 (B) +3 and +3
 (C) +6 and +6 (D) +4 and +6
69. The oxidation state of the underlined element in the given compound is:
 $\text{BaCl}\underline{\text{I}}_2$
 (A) +2 (B) -2
 (C) 0 (D) None of these
70. What is the oxidation state of central atom in $\text{Ca}[\underline{\text{Pt}}\text{Cl}_4]$?
 (A) 1 (B) 2 (C) 3 (D) 4
71. Which among the following shows maximum oxidation state?
 (A) V (B) Fe (C) Mn (D) Cr
72. What is the oxidation number of O in a diatomic molecule (O_2)?
 (A) +2 (B) ± 2 (C) +8 (D) 0
73. In which of the following, the highest oxidation state is not possible?
 (A) $[\text{XeO}_6]^{4-}$ (B) XeF_8 (C) OsO_4 (D) RuO_4
74. What is the oxidation state of Mn in the compound K_2MnO_4 ?
 (A) 3 (B) 4 (C) 5 (D) 6
75. Plumbous ion is represented as:
 (A) Pb^{+2} (B) Pb^{+4} (C) Pb^{+3} (D) Pb^{+1}
76. Oxidation number of C in HNC is _____.
 (A) +2 (B) -3 (C) +3 (D) Zero
77. In which of the following groups of iodine compounds shows increasing order of oxidation states:
 (A) HIO_4 , ICl , I_2 , HI (B) HI , I_2 , ICl , HIO_4
 (C) I_2 , HI , HIO_4 , HI (D) ICl , HIO_4 , HI , I_2
78. Which of the following is not an example of redox reaction?
 (A) $\text{CuO} + \text{H}_2 \longrightarrow \text{Cu} + \text{H}_2\text{O}$
 (B) $\text{Fe}_2\text{O}_3 + 3\text{CO} \longrightarrow 2\text{Fe} + 3\text{CO}_2$
 (C) $2\text{K} + \text{F}_2 \longrightarrow 2\text{KF}$



79. Identify the correct statement (s) in relation to the following reaction:



- (A) Zinc is acting as an oxidant. (B) Chlorine is acting as a reductant.
(C) Hydrogen ion is acting as an oxidant. (D) Zinc is acting as a reductant.

80. In $\text{Ni}(\text{CO})_4$, the oxidation state of Ni is?

- (A) 4 (B) Zero (C) 2 (D) 8

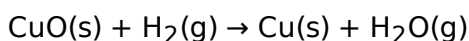
81. What is the oxidation number of lithium in LiCl ?

- (A) +3 (B) -1 (C) +1 (D) 0

*** Answer The Following Questions In One Sentence.[1 Marks Each]**

[11]

82. Justify that the following reactions are redox reactions:



83. What happens when Cu^{2+} is added KI solution? Indicator used in this titration?

84. What is the relationship between direction of current and flow of electrons by convention?

85. What is oxidation state of Cr in $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$

86. What are spectator ions? Give one example.

87. What is the relationship between standard oxidation potential and standard reduction potential?

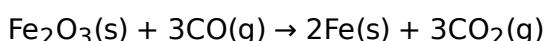
88. Out of Zn and Cu vessel which one will be more suitable to store 1M HCl?

$$E_{\text{Zn}^{2+}/\text{Zn}}^\circ = -0.76\text{V}$$

$$E_{\text{Cu}^{2+}/\text{Cu}}^\circ = +0.34\text{V}$$

89. How to find strength of KMnO_4 by titrating it with Mohr's salt in acidic medium?

90. Justify that the following reactions are redox reactions:



91. $\text{Br}_2 + 2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{Br}^-$, will this reaction take place or not?

$$E_{\text{Br}_2/\text{Br}^-}^\circ = +1.09\text{V}$$

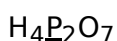
$$E_{\text{Cl}_2/\text{Cl}^-}^\circ = +1.36\text{V}$$

92. Refer to the periodic table given in your book and now answer the following questions:
Select the possible non metals that can show disproportionation reaction.

*** Given Section consists of questions of 2 marks each.**

[22]

93. Assign oxidation number to the underlined elements in the following species:

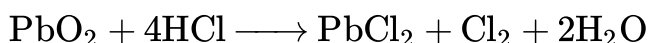
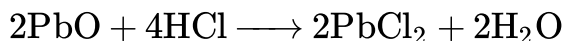


94. The compound $\text{YBa}_2\text{Cu}_3\text{O}_7$, which shows superconductivity, has copper in x oxidation state. Assume that the rare earth element yttrium is in its usual +3 oxidation state. Predict the value of x.

95.

Permanganate ion reacts with bromide ion in basic medium to give manganese dioxide and bromate ion. Write the balanced chemical equation for the reaction.

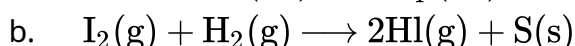
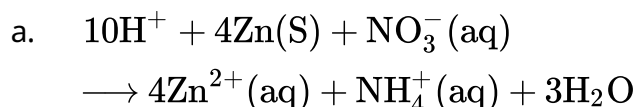
96. PbO and PbO₂ react with HCl according to following chemical equations:



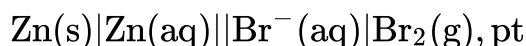
Why do these compounds differ in their reactivity?

97. In neutral or faintly alkaline solution '8' moles of permanganate anions quantitatively oxidise this sulphate anions to produce 'x' moles of sulphur containing product. What is magnitude of 'X'.

98. i. Identify the oxidant and reductant in the following reactions:



- ii. Write the anode, cathode and net cell reaction for the following cell:



- iii. Give two main functions of salt bridge.

99. Balance $\text{P} + \text{HNO}_3 \longrightarrow \text{H}_3\text{PO}_4 + \text{NO}_2 + \text{H}_2\text{O}$ by oxidation number method.

100. What happens when Cl₂ gas is passed through aqueous solution of KBr? What type of redox reaction is it?

101. Balance the following equation: $\text{Br}_2 + \text{H}_2\text{O}_2 \longrightarrow \text{BrO}_3^- + \text{H}_2\text{O}$ (in acidic medium)

102. Calculate the oxidation number of phosphorus in the following species.



103. How many millimoles of potassium dichromate is required to oxidise 24mL of 0.5M Mohr's salt solution in acidic medium?

* Given Section consists of questions of 3 marks each.

[21]

104. Using the standard electrode potentials given in the Table, predict if the reaction between the following is feasible:

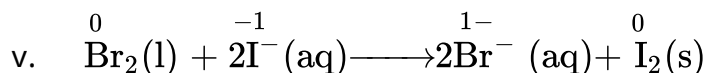
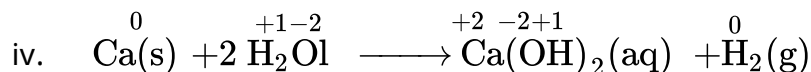
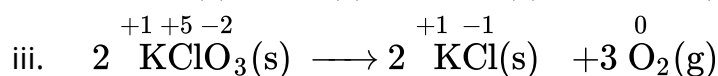
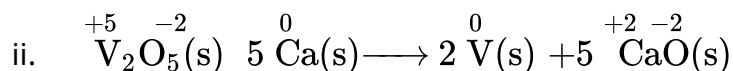
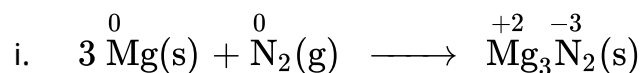
Reactions (Oxidized form + ne ⁻)	Reduced form	E ⁰ / V
F ₂ (g) + 2e ⁻	→ 2F ⁻	2.87
Co ³⁺ + e ⁻	→ Co ²⁺	1.81
H ₂ O ₂ + 2H ⁺ + 2e ⁻	→ 2H ₂ O	1.78
MnO ₂ + 4H ⁺ + 2e ⁻	→ Mn ²⁺ + 2H ₂ O	1.51
Au ³⁺ + 3e ⁻	→ Au(s)	1.40
Cl ₂ (g) + 2e ⁻	→ 2Cl ⁻	1.36
Cr ₂ O ₇ ²⁻ + 14H ⁺ + 6e ⁻	→ 2Cr ³⁺ + 7H ₂ O	1.33
O ₂ (g) + 4H ⁺ + 4e ⁻	→ 2H ₂ O	1.23
MnO ₄ ⁻ + 4H ⁺ + 2e ⁻	→ Mn ²⁺ + 2H ₂ O	1.23
Br ₂ + 2e ⁻	→ 2Br ⁻	1.09
NO ₃ ⁻ + 4H ⁺ + 3e ⁻	→ NO(g) + 2H ₂ O	0.97
2Hg ²⁺ + 2e ⁻	→ Hg ₂ ²⁺	0.92
Ag ⁺ + e ⁻	→ Ag(s)	0.80
Fe ³⁺ + e ⁻	→ Fe ²⁺	0.77
O ₂ (g) + 2H ⁺ + 2e ⁻	→ H ₂ O ₂	0.68
I ₂ (s) + 2e ⁻	→ 2I ⁻	0.54
Cu ²⁺ + e ⁻	→ Cu ⁺	0.52
Cu ²⁺ + 2e ⁻	→ Cu(s)	0.34
AgCl(s) + e ⁻	→ Ag(s) + Cl ⁻	0.22
AgBr(s) + e ⁻	→ Ag(s) + Br ⁻	0.10
2H ⁺ + 2e ⁻	→ H ₂ (g)	0.00
Pb ²⁺ + 2e ⁻	→ Pb(s)	-0.13
Sn ²⁺ + 2e ⁻	→ Sn(s)	-0.14
Ni ²⁺ + 2e ⁻	→ Ni(s)	-0.25
Fe ²⁺ + 2e ⁻	→ Fe(s)	-0.44
Cr ³⁺ + 3e ⁻	→ Cr(s)	-0.74
Zn ²⁺ + 2e ⁻	→ Zn(s)	-0.76
2H ₂ O + 2e ⁻	→ H ₂ (g) + 2OH ⁻	-0.83
Al ³⁺ + 3e ⁻	→ Al(s)	-1.66
Mg ²⁺ + 2e ⁻	→ Mg(s)	-2.36
Na ⁺ + e ⁻	→ Na(s)	-2.71
Cu ²⁺ + 2e ⁻	→ Cu(s)	-2.87
K ⁺ + e ⁻	→ K(s)	-2.93
Li ⁺ + e ⁻	→ Li(s)	-3.05

Br₂(aq) and Fe²⁺(aq).

105. One mole of N₂H₄ loses 10 moles electrons to form a new compound Y. Assuming that all the nitrogen appears in the new compound, what is the oxidation number of N in Y?

There is no change in oxidation state of H.

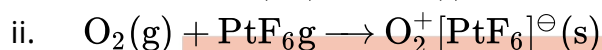
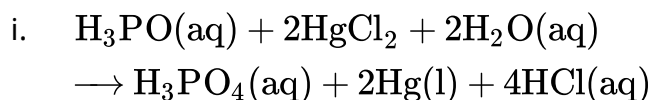
106. Identify the type of redox reaction taking place in the following.



107. How does Cu_2O act as both oxidant and reductant? Explain with proper reactions showing the change of oxidation numbers in each example.

108. Why does fluorine not show disproportionation reaction?

109. a. In the following redox reactions, identify the oxidation and reducing agents:



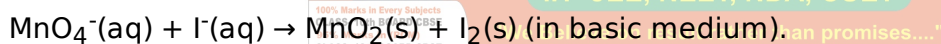
b. Why does H_2S acts as reducing agent only whereas SO_2 acts as both oxidant as well as reductant?

110. Copper dissolves in dilute nitric acid but not in dilute HCl. Explain.

* **Given Section consists of questions of 5 marks each.**

[65]

111. Balance the following redox reactions by ion-electron method:

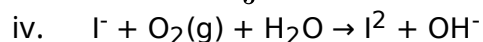
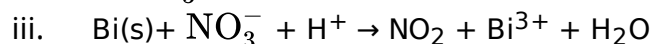
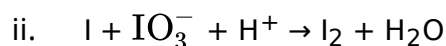
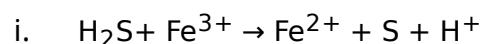


112. While sulphur dioxide and hydrogen peroxide can act as oxidising as well as reducing agents in their reactions, ozone and nitric acid act only as oxidants. Why?

113. Calculate the oxidation number of sulphur, chromium and nitrogen in H_2SO_5 , $\text{Cr}_2\text{O}_7^{2-}$ and NO_3^- . Suggest structure of these compounds. Count for the fallacy.

114. Whenever a reaction between an oxidising agent and a reducing agent is carried out, a compound of lower oxidation state is formed if the reducing agent is in excess and a compound of higher oxidation state is formed if the oxidising agent is in excess. Justify this statement giving three illustrations.

115. Write correctly the balanced equations for the following redox reactions using half reactions.



State what is oxidised to what and what is reduced to what in the reactions expressed by the equations?

116. i. Use the following reactions to arrange the elements A, B, C and D in order of their redox reactivity:

- a. $A + B^+ \rightarrow At + B$
- b. $B + D^+ \rightarrow B^+ + D$
- c. $C^+ + D \rightarrow \text{No reaction}$
- d. $B^+C^+ \rightarrow B^+ + C$
- ii. On the basis of above redox activity series, predict which of the following reactions would you expect to occur?
 - a. $A^+ + C \rightarrow A^+ C^+$
 - b. $A^+ + D \rightarrow A^+ D^+$

117. a. Consider the following redox reaction that produce electricity in a galvanic cell:
- i. $2Fe^{3+} + 2Cl^- \longrightarrow 2Fe^{2+} + Cl_2(g)$
 - ii. $Cd(s) + I_2 \longrightarrow Cd^{2+} + 2I^-$
 - iii. $2Cr(s) + 3Cu^{2+} \longrightarrow 2Cr^{3+} + 3Cu(s)$

Write the anode and cathode reaction for galvanic cell.

- b. Split the following redox reaction into the oxidation and reduction half reactions:
 - i. $Zn + Cu^{2+} \longrightarrow Zn^{2+} + Cu$
 - ii. $Sn^{2+} + 2Hg^{2+} \longrightarrow Sn^{4+} + 2Hg$

118. Consider the cell reaction of an electrochemical cell:

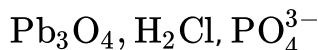


Answer the following questions:

- i. Write anode and cathode half reactions.
- ii. Mention the direction of flow of electrons.
- iii. How is the electroneutrality maintained in solution of two half cells?
- iv. Write the formula for calculating standard e.m.f of this cell.
- v. How does e.m.f. change when concentration of Ag^+ is decreased?

119. a. Identify the oxidising agent and reducing agent in the following reactions:
- i. $MnO_2 + 4HCl \longrightarrow MnCl_2 + Cl_2 + 2H_2O$
 - ii. $2MnO_4^- + 10Cl^- + 16H^+ \longrightarrow 2Mn^{2+} + 5Cl_2 + 8H_2O$

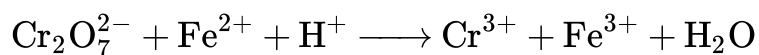
- b. Calculate the oxidation number of underlined elements in the following species.



120. Using electron transfer concept, identify the oxidant and reductant in the following redox reactions.

- i. $Zn(s) + 2H^+(aq) \longrightarrow Zn^{2+}(aq) + H_2(g)$
- ii. $2[Fe(CN)_6]^{4-}(aq) + H_2O_2(aq) + 2H^+(aq) \longrightarrow 2[Fe(CN)_6]^{3-}(aq) + 2H_2O(l)$
- iii. $2[Fe(CN)_6]^{3-}(aq) + 2OH^-(aq) + H_2O_2(aq) \longrightarrow 2[Fe(CN)_6]^{4-}(aq) + O_2(g) + 2H_2O(l)$
- iv. $BrO_3^-(aq) + F_2(g) + 2OH^-(aq) \longrightarrow BrO_4^-(aq) + F^-(aq) + H_2O(l)$
- v. $2NaClO_3(aq) + I_2(aq) \longrightarrow 2NaIO_3(aq) + Cl_2(g)$

121. Balance the following ionic equations.

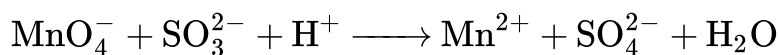


122. Write balanced chemical equation for the following reactions:

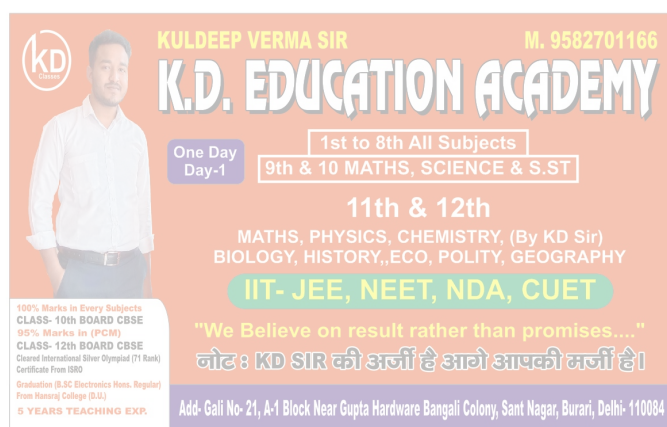
Permanganate ion (MnO_4^-) reacts with sulphur dioxide gas in acidic medium to produce Mn^{2+} and hydrogensulphate ion.

(Balance by ion electron method)

123. Balance the following ionic equations.



----- Stay away from those people who try to disparage your ambitions. ... -----



KULDEEP VERMA SIR M. 9582701166
K.D. EDUCATION ACADEMY

One Day Day-1 1st to 8th All Subjects
9th & 10 MATHS, SCIENCE & S.ST

11th & 12th
MATHS, PHYSICS, CHEMISTRY, (By KD Sir)
BIOLOGY, HISTORY, ECO, POLITY, GEOGRAPHY

IIT- JEE, NEET, NDA, CUET

"We Believe on result rather than promises...."
नोट : KD SIR की अर्जी है आगे आपकी मर्जी है।

100% Marks in Every Subjects
CLASS- 10th BOARD CBSE
95% Marks in (PCM)
CLASS- 12th BOARD CBSE
Cleared International Silver Olympiad (71 Rank)
Certificate From IISG
Graduation (B.Sc Electronics Hons. Regular)
From Hansraj College (D.U.)
5 YEARS TEACHING EXP.

Add- Gali No- 21, A-1 Block Near Gupta Hardware Bangali Colony, Sant Nagar, Burari, Delhi- 110084