Basic Exercise

1. Which of the following is not an ore of Iron:-

(1) Haematite (2) Limonite (3) Cassiterite (4) Magnetite

Ans. **(3)**

2. Aluminium is obtained from Al_2O_3 by this method

(1) Thermal reduction. (2) Hydro metallurgical method.

(3) Electrolytic reduction. (4) Reduction by iron.

Ans. **(3)**

3. Zinc blende on roasting in air gives :–

(1) Zinc carbonate (2) SO_2 and ZnO (3) ZnS and $ZnSO_4$ (4) CO_2 and ZnO

Ans. **(2)**

4. Litharge is a mineral of:-

(1) Magnesium (2) Lithium (3) Lead (4) Zinc

Ans. **(3)**

5. The oxide cannot be reduced by coke

(1) Cu_2O, K_2O (2) Fe_2O, ZnO (3) CaO, K_2O (4) PbO, Fe_3O_4

Ans. **(3)**

6. Chemical formula of horn silver is:-

(1) Ag_2S (2) AgCl (3) $AgNO_3$ (4) $Ag_2S.\ Sb_2S_3$

Ans. **(2)**

7. An example of halide ores is:-

(1) Galena (2) Bauxite (3) Cinnabar (4) Cryolite

Ans. **(4)**

8. Which is not a basic flux :-

(1) Silica (2) Lime stone (3) Calcite (4) Quick lime

Ans. **(1)**

9. Iron pyrites ore is concentrated by:-

(1) Froth floatation (2) Electrolysis (3) Roasting (4) Magnetic separation

Ans. **(1)**

10. Which of the following metal is extracted by electrolytic reduction process of its halide are :-

(1) Copper (2) Iron (3) Sodium (4) Aluminium

Ans. **(3)**

11. Which of the following metal can not be extracted by smelting process:-

(1) Lead (2) Zinc (3) Iron (4) Aluminium

Ans. **(4)**

12. The main reducing agent for the extraction of a metal in a blast furnace is:-

(1) Coke (2) Carbon (3) Carbon dioxide (4) Carbon monoxide

Ans. **(4)**

13. The flux used in extraction of Iron from haematite in the blast furnace is:-

(1) Silica (2) Lime stone (3) Phosphorus chloride (4) Calcium phosphate

Ans. **(2)**

14. The reduction of Cr_2O_3, by heating it with aluminium is known as:-

(1) Smelting (2) Roasting (3) Calcination (4) Aluminothermic process

Ans. **(4)**

15. Which of the following is obtained by hydrometallurgy :-

(1) Copper (2) Gold (3) Silver (4) All of these

Ans. **(4)**

16. Aluminium is purified by :-

(1) Roasting (2) Sublimation (3) Electrolytic refining (4) Reduction with carbon

Ans. **(3)**

17. In Goldschmidt thermite process, reducing agent is:-

(1) Fe (2) Na (3) Ca (4) Al

Ans. **(4)**

18. Heating pyrites in air to remove sulphur is known as:-

(1) Roasting (2) Calcination (3) Smelting (4) Fluxing

Ans. **(1)**

19. Liquation process is used for refining:-

(1) Bismuth (2) Lead (3) Tin (4) All

Ans. **(4)**

20. A mineral is called ore if

(1) Metal present in the mineral is costly

(2) A metal can be extracted from it

(3) A metal can be extracted profitably from it

(4) A metal can not be extracted from it

Ans. **(3)**

21. Autoreduction process is used in the extraction of:-

(1) Cu & Pb (2) Zn & Hg (3) Cu & Al (4) Fe & Pb

Ans. **(1)**

22. In thermite process, thermite mixture is:-

(1) Al powder + sulphide (2) Zn + oxide powder (3) Na + Oxide (4) Al powder + oxide

Ans. **(4)**

23. The process of converting hydrated Alumina into anhydrous Alumina is called:-

(1) Roasting (2) Calcination (3) Smelting (4) Dressing

Ans. **(2)**

24. The metallurgical process in which a metal is obtained in a fused state is called:-

(1) Smelting (2) Roasting (3) Calcination (4) Froth floatation

Ans. **(1)**

25. In the extraction of copper, metal is formed in the Bessemer converter due to reaction:-

(1) $Cu_2S + 2Cu_2O \rightarrow 6Cu + SO_2$ (2) $Cu_2S \rightarrow 2Cu + S$

(3) $Fe + Cu_2O \rightarrow 2Cu + FeO$ (4) $2Cu_2O \rightarrow 4Cu + O_2$

Ans. **(1)**

26. In the electrolytic refining of copper, Ag and Au are found:-

(1) On cathode (2) On anode (3) In the anodic mud (4) In the cathodic mud

Ans. **(3)**

27. Consider :–

(a) Copper blende = Cu_2O (b) Chromite = Magnetic separation.

(c) Bauxite = $Al_2O_3.2H_2O$ (d) Liquation = Liquid metals e.g. Hg

Which is/are not correctly matched :–

(1) (a) only (2) (b) only (3) (d) only (4) (a) & (d) both

Ans. **(4)**

28. Silver can be separated from lead by :-

(1) Distillation (2) Amalgamation (3) Filtration (4) Cupellation

Ans. **(4)**

29. In blast furnace this is acting as reducing agent at lower part :–

(1) CO (2) H_2 (3) C (4) None

Ans. **(3)**

30. Which of the following metals can not be extracted by carbon reduction process :–

(1) Pb (2) Al (3) Sn (4) Zn

Ans. **(2)**

31. The maximum temperature obtained in the....region of the blast furnace used in extraction of iron:-

(1) Reduction (2) Combustion (3) Fusion (4) Slag formation

Ans. **(2)**

32. The concentration of chromite (FeO. Cr_2O_3) is done by :-

(1) Leaching process (2) Magnetic separation (3) Froth -flotation (4) Calcination

Ans. **(2)**

33. Which of the following process involves smelting

(1) $2\,PbS + 3O_2 \rightarrow 2PbO + 2SO_2\uparrow$ (2) $Al_2O_3.\,2H_2O \rightarrow Al_2O_3 + 2H_2O$

(3) $Fe_2O_3 + CO \rightarrow 2Fe + 2CO_2$ (4) $Cr_2O_3 + 2Al \rightarrow Al_2O_3 + 2Cr + Heat$

Ans. **(3)**

34. Out of the following, which ores are calcinated during extraction :-

(a) Copper pyrites (b) Malachite (c) Bauxite

Correct answer is :-

(1) a, b, c (2) b, c (3) Only a (4) All

Ans. **(2)**

35. Which of the following match are incorrect :-

(a) Goldschmidt aluminothermite process - Cr_2O_3

(b) Mac Arther cyanide process - Fe

(c) Mond process - Ni

(d) Van Arkel process – Au

(1) a, c (2) c, d (3) b, d (4) a, b

Ans. **(3)**

36. Electro metallurgical process (electrolysis of fused salt) is employed to extract :–

(1) Lead (2) Silver (3) Sodium (4) Copper

Ans. **(3)**

37. In the extraction of copper from pyrites, iron is removed as:-

(1) $FeSO_4$ (2) $FeSiO_3$ (3) Fe_3O_4 (4) Fe_2O_3

Ans. **(2)**

38. Which one of the following metals can not be extracted by using Al as a reducing agent :-

(1) Na from Na_2O (2) Cr from Cr_2O_3 (3) Mn from MnO_2 (4) V from V_2O_5

Ans. (1)

39. In the electrolytic refining for aluminium extraction the electrolyte used is:-

(1) Fluorides of Al, Na and Ba (2) $Al(OH)_3$ in NaOH solution

(3) An aqueous solution of $Al_2(SO_4)_3$ (4) Molten Al_2O_3

Ans. (1)

40. Which one is mismatched :-

(1) Poling – refining of copper (2) Cupellation – refining of silver

(3) Smelting – An oxidation process (4) Roasting – An oxidation process

Ans. (3)

41. Which metal can be purified by distillation :-

(1) Cu (2) Ag (3) Fe (4) Hg

Ans. (4)

42. Carbon cannot be used in the reduction of Al_2O_3 because :-

(1) it is an expensive

(2) the enthalpy of formation of CO_2 is more than that of Al_2O_3

(3) pure carbon is not easily available

(4) the enthalpy of formation of Al_2O_3 is too high

Ans. (4)

43. Match list I with list II and select the correct answer using the codes given below the lists

List I		**List II**
A. Van Arkel method	I.	Purification of titanium
B. Solvay process	II.	Manufacture of Na_2CO_3
C. Cupellation	III.	Purification of copper
D. Poling	IV.	Refining of silver

Codes :

	A	B	C	D		A	B	C	D
(1)	I	II	IV	III	(2)	II	I	III	IV
(3)	IV	II	I	III	(4)	III	I	II	IV

Ans. (1)

44. Anode mud obtained after electrolytic refining of copper contains :-

(1) Ag (2) Au (3) Pt (4) All

Ans. (4)

45. Matte :-

(1) $Cu_2S + FeS$ (2) $Cu_2O + FeS$ (3) $Cu_2O + Cu_2S$ (4) $FeS + SiO_2$

Ans. (1)

46. Which of the following reaction is not involved in thermite process :-

(1) $3Mn_3O_4 + 8Al \longrightarrow 9Mn + 4Al_2O_3$ (2) $Cr_2O_3 + 2AI \longrightarrow Al_2O_3 + 2Cr$

(3) $2Fe + Al_2O_3 \longrightarrow 2Al + Fe_2O_3$ (4) $B_2O_3 + 2Al \longrightarrow 2B + Al_2O_3$

Ans. (3)

47. Alumino thermite process is used for the extraction of metals, whose oxides are :-

(1) Strongly acidic (2) Not easily reduced by carbon

(3) Not easily reduced by hydrogen (4) Strongly basic

Ans. **(2)**

48. Match the following

I	II
(A) Calcination	a. $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$
(B) Roasting	b. $Fe_2O_3.\ nH_2O \rightarrow Fe_2O_3 + nH_2O$
(C) Flux	c. $Cr_2O_3 + 2Al \rightarrow Al_2O_3 + 2Cr$
(D) Thermite	d. $SiO_2 + FeO \rightarrow FeSiO_3$

	A	B	C	D
(1)	a	b	c	d
(2)	b	a	d	c
(3)	d	a	b	c
(4)	c	a	b	d

Ans. **(2)**

49. Of the following reduction processes :-

A : $Fe_2O_3 + C \longrightarrow Fe$ B : $ZnO + C \longrightarrow Zn$

C : $SnO_2 + C \longrightarrow Sn$ D : $PbO + C \longrightarrow Pb$

Correct processes are :

(1) A, B, C and D (2) A, B, D (3) A, B, C (4) B, D

Ans. **(1)**

50. Main source of lead is PbS. It is converted to Pb by :-

A : $PbS \xrightarrow[\Delta]{air} PbO + SO_2 \xrightarrow[\Delta]{C} Pb + CO_2$

B : $PbS \xrightarrow[\Delta]{air} PbO + PbS \xrightarrow{\Delta} Pb + SO_2$

Self reduction process is :

(1) A (2) B (3) both (4) none

Ans. **(2)**

51. When haematite ore is burnt in air with coke along with lime at 200°C, the process not only produces steel but also produces an important compound (A), which is useful in making building materials. The compound (A) is

(1) SiO_2 (2) $CaSiO_3$ (3) FeO (4) Fe_2O_3

Ans. **(2)**

52. Match List-I with List-II and select the correct answer using the codes given below the list.

List-I (Metals)	**List - II**
(Process/methods involved in extraction process)	
(a) Au	1. Self reduction
(b) Al	2. Liquation
(c) Pb	3. Electrolysis
(d) Sn	4. Bayer's process

	(a)	(b)	(c)	(d)
(1)	3	1	2	4
(2)	3	4	1	2
(3)	1	2	4	3
(4)	3	2	4	1

Ans. **(2)**

53. Main function of the collectors in metallurgy is :

(1) Stick to the ore and then take it to rise upto the top

(2) Convert the insoluble ore into soluble part

(3) Make the ore hydrophobic

(4) None

Ans. **(1)**

54. Reducing agent of haematite in blast-furnace is

(1) Coke in furnace

(2) Coke in upper part and CO in lower part of furnace

(3) CO in most parts of the furnace

(4) CO in the furnace

Ans. **(3)**

55. $PbS \xrightarrow[\Delta]{air} X$, $X + PbS \longrightarrow Pb + SO_2$. 'X' is

(1) PbO (2) PbO_2 (3) PbO and $PbSO_4$ (4) PbO_2 and PbO

Ans. **(3)**

56. Which one of the following statements is incorrect ?

(1) Tin is extracted by carbon reduction (smelting)

(2) Aluminium is extracted by Hall's process which involves carbon reduction

(3) Extraction of lead does not involve bessemerisation

(4) Silver is extracted by cyanide process

Ans. **(2)**

57. Extraction of zinc from zinc blende is achieved by

(1) Electrolytic reduction

(2) roasting followed by reduction with carbon

(3) roasting followed by reduction with another metal

(4) roasting followed by self-reduction

Ans. **(2)**

58.

Column- I	**Column - II**
(1) Metal which occur in the native state in nature is	(P) Hg
(2) The oxides of metal that can be commercially reduced by Aluminorthermic reduction process is	(Q) Ti
(3) van Arkel method is used for preparing ultrapure metal of	(R) Cr
(4) Auto reduction process is employed for the sulphide ore of	(S) Ag

(1) A-S, B-R, C-Q, D-P (2) A-R, B-S, C-Q, D-P (3) A-P, B-S, C-Q, D-R (4) A-Q, B-R, C-S, D-P

Ans. **(1)**

Analytical Exercise

1. In the extraction of silver, Ag_2S is dissolved in :

(1) HCl (2) HNO_3 (3) KCN (4) H_2SO_4

Ans. **(3)**

2. The method of zone refining of metals is based on the principle of :-

(1) Greater mobility of the pure metal than that of the impurity

(2) Higher melting point of the impurity than that of the pure metal

(3) Greater noble character of the solid metal than that of the impurity

(4) Greater solubility of the impurity in the molten state than in the solid

Ans. **(4)**

3. Which one of the following ores is best concentrated by froth-flotation method :

(1) Galena (2) Cassiterite (3) Magnetite (4) Malachite

Ans. **(1)**

4. Which of the following sulphides when heated strongly in air gives the corresponding metal ?

(1) Cu_2S (2) CuS (3) FeS (4) HgS

Ans. **(4)**

5. Stainless steel does not rust because –

(1) Chromium and nickel combine with iron

(2) Chromium forms an oxide layer and protects iron from rusting

(3) Nickel present in it, does not rust

(4) Iron forms a hard chemical compound with chromium present in it

Ans. **(2)**

6. In the electrolytic method of obtaining aluminium from purified bauxite, cryolite is added to the charge in order to –

(1) Minimise the heat loss due to radiation

(2) Protect aluminium produced from oxygen

(3) dissolve bauxite and render it conductor of electricity

(4) Lower the melting point of bauxite

Ans. **(4)**

7. In froth floatation process for the purification of ores, the particles of ore float because–

(1) Their surface is not easily wetted by water

(2) They are light

(3) They are insoluble

(4) They bear electrostatic charge

Ans. **(1)**

8. Extraction of zinc from zinc blende is achieved by

(1) Electrolytic reduction

(2) Roasting followed by reduction with carbon

(3) Roasting followed by reduction with another metal

(4) Roasting followed by self-reduction.

Ans. **(2)**

9. Purification of Ge like semiconductor is done by

(1) Cyanide process (2) Van arkel process

(3) Alumino thermite (4) Zone refining

Ans. **(4)**

10. Which of the following contains both Cu & Fe :-

(1) Chalcocite (2) Chalcopyrites (3) Malachite (4) Epsum

Ans. **(2)**

11. Which method of purification is represented by the following equation :

$Ti(s) + 2I_2(g) \xrightarrow{523K} TiI_4(g) \xrightarrow{1700\,K} Ti(s) + 2I_2(g)$

(1) Zone refining **(2)** Cupellation **(3)** Polling **(4)** Van Arkel

Ans. **(4)**

12. The distillation technique most suited for separating glycerol from spent-lye in the soap industry is:

(1) Fractional distillation **(2)** Steam distillation

(3) Distillation under reduced pressure **(4)** Simple distillation

Ans. **(3)**

13. Which one of the following ores is best concentrated by froth floatation method?

(1) Siderite **(2)** Galena **(3)** Malachite **(4)** Magnetite

Ans. **(2)**

14. Galvanization is applying a coating of:

(1) Cr **(2)** Cu **(3)** Zn **(4)** Pb

Ans. **(3)**

15. The metal that cannot be obtained by electrolysis of an aqueous solution of its salts is :

(1) Cu (2) Cr (3) Ag (4) Ca

Ans. **(4)**

16. Which series of reactions correctly represents chemical relations related to iron and its compound ?

(1) $Fe \xrightarrow{Cl_2,heat} FeCl_3 \xrightarrow{heat,air} FeCl_2 \xrightarrow{Zn} Fe$

(2) $Fe \xrightarrow{O_2,heat} Fe_3O_4 \xrightarrow{CO,600°C} FeO \xrightarrow{CO,700°C} Fe$

(3) $Fe \xrightarrow{dil.\ H_2SO_4} FeSO_4 \xrightarrow{H_2SO_4,O_2} Fe_2(SO_4)_2 \xrightarrow{Heat} Fe$

(4) $Fe \xrightarrow{O_2,heat} FeO \xrightarrow{dil.\ H_2SO_4} FeSO_4 \xrightarrow{Heat} Fe$

Ans. **(2)**

17. Calamine is an ore of :

(1) Zn **(2)** Mg **(3)** Ca **(4)** Pb

Ans. **(1)**

18. Black tin is

(1) an alloy of Sn **(2)** an allotrope of Sn **(3)** 60-70 percent SnO_2 **(4)** 100 percent SnO_2

Ans. **(3)**

19. Which of the following manufactured by the electrolysis of their fused salts.
(1) Copper **(2)** Sodium **(3)** Aluminium **(4)** Platinum

Ans. **(2, 3)**

20. Select correct statement
(1) In the decomposition of an oxide into oxygen and solid/liquid metal, entropy increases.
(2) Decomposition of an oxide is an endothermic change.
(3) To make ΔG° negative, temperature should be high enough so that $T\Delta S^\circ > \Delta H^\circ$.
(4) All are correct statements.

Ans. **(4)**

21. The smelting of iron in a blast furnace involves, which of the following process/(es) ?
(1) Combustion **(2)** Reduction
(3) Slag formation **(4)** Sublimation

Ans. **(1, 2, 3)**

22. During the electrolytic reduction of aluminium, the carbon anodes are replaced from time to time because:
(1) the carbon anodes get decayed
(2) the carbon prevents atmospheric oxygen from coming in contact with aluminium
(3) oxygen liberated at the carbon anodes reacts with anodes to form CO and CO_2
(4) carbon converts Al_2O_3 to Al

Ans. **(3)**

23. NaCl and $CaCl_2$ are added to fused $MgCl_2$ in the electrolysis of $MgCl_2$ since :
(1) melting point is decreased and conductivity is increased.
(2) melting point is increased and conductivity is decreased.
(3) melting point and conductivity both are decreased.
(4) melting point and conductivity both are increased.

Ans. **(1)**

24. Aluminium metal is purified by :
(1) Hooper's process **(2)** Hall-Heroult process **(3)** Serpeck's process **(4)** Baeyer's process

Ans. **(1)**

25. Dolomite is mineral whose formula is :
(1) $CaMg(CO_3)_2$ **(2)** $MgCO_3$ **(3)** $CaCO_3.MgCO_3$ **(4)** (1) & (3) both

Ans. **(4)**

26. The slag consists of molten impurities, generally, in the form of :
(1) metal carbonate **(2)** metal silicate **(3)** metal oxide **(4)** metal nitrate

Ans. **(2)**

27. Ellingham diagram represents :
(1) change of ΔG with temperature. **(2)** change of ΔH with temperature.
(3) change of ΔG with pressure. **(4)** change of $(\Delta G - T\Delta S)$ with temperature.

Ans. **(1)**

28. Magnesium is extracted by electrolysing fused magnesium chloride containing NaCl & $CaCl_2$ using :
(1) a nickel cathode and a graphite anode.
(2) the iron container as anode and a nickel cathode.
(3) the iron container as cathode and a graphite rod as anode.
(4) the nickel container as cathode and iron anode.

Ans. **(3)**

29. Which one of the following processes involves the principle of fractional crystallisation for the refining of impure metals ?
(1) Parkes process **(2)** Mond's process **(3)** Van Arkel process **(4)** Zone refining

Ans. **(4)**

30. The rocky and silicious matter associated with an ore is called :
(1) slag **(2)** mineral **(3)** matrix or gangue **(4)** flux

Ans. **(3)**

31. Slag is a product of :

(1) flux and coke. **(2)** coke and metal oxide.

(3) flux and impurities. **(4)** metal and flux.

Ans. **(3)**

32. Tin and zinc can be refined by :

(1) cupellation **(2)** liquation **(3)** poling **(4)** bessemerisation.

Ans. **(2)**

33. Copper and tin are refined by :

(1) liquation **(2)** cupellation **(3)** bessemerisation **(4)** poling.

Ans. **(4)**

34. Leaching of Ag_2S is carried out by heating it with a dilute solution of :

(1) NaCN only **(2)** HCl **(3)** NaOH **(4)** NaCN in presence of O_2

Ans. **(4)**

Previous Year Exercise

1. Extraction of gold and silver involves leaching with CN^- ion. Silver is later recovered by **[NEET-2017]**

(1) Liquation (2) Distillation (3) Zone refining (4) Displacement with Zn

Ans. **(4)**

2. Match items of Column I with the items of Column II and assign the correct code : **[NEET- 2016]**

Column I		**Column II**
(a) Cyanide process	(i)	Ultrapure Ge
(b) Froth floatation process	(ii)	Dressing of ZnS
(c) Electrolytic reduction	(iii)	Extraction of Al
(d) Zone refining	(iv)	Extraction of Au
	(v)	Purification of Ni

Code :

	(a)	**(b)**	**(c)**	**(d)**
(1)	(iii)	(iv)	(v)	(i)
(2)	(iv)	(ii)	(iii)	(i)
(3)	(ii)	(iii)	(i)	(v)
(4)	(i)	(ii)	(iii)	(iv)

3. In extraction of metal by bessemerisation, Cu_2S is converted into **[AIIMS - 2015]**

(1) Cu_2O (2) CuO (3) Cu (4) $CuFeO_2$

Ans. **(1)**

4. Which of the following is separated as slag during extraction of Fe in blast furnace : **[AIIMS - 2014]**

(1) SiO_2 (2) Al_2O_3 (3) CaO (4) MgO

Ans. **(1)**

5. Aluminium is extracted from alumina (Al_2O_3) by electrolysis of a molten mixture of **[AIPMT (Prelims)-2012]**

(1) $Al_2O_3 + Na_3AlF_6 + CaF_2$ (2) $Al_2O_3 + KF + Na_3AlF_6$

(3) $Al_2O_3 + HF + NaAlF_4$ (4) $Al_2O_3 + CaF_2 + NaAlF_4$

Ans. **(2)**

6. In the extraction of copper from its sulphide ore, the metal is finally obtained by the reduction of cuprous oxide with **[AIPMT (Prelims)-2012]**

(1) Iron sulphide (FeS) (2) Carbon monoxide (CO)

(3) Copper (I) sulphide (Cu_2S) (4) Sulphur dioxide (SO_2)

Ans. **(3)**

7. Identify the alloy containing a non-metal as a constituent in it **[AIPMT (Prelims)-2012]**

(1) Bell metal (2) Bronze (3) Invar (4) Steel

Ans. **(4)**

8. Which one of the following is a mineral of iron ? **[AIPMT (Prelims)-2012]**

(1) Pyrolusite (2) Magnetite (3) Malachite (4) Cassiterite

Ans **(2)**

9. Which of the following pairs of metals is purified by Van Arkel method ? **[AIPMT (Prelims)-2011]**

(1) Ni and Fe (2) Ge and ln (3) Zr and Ti (4) Ag and Au

Ans. **(3)**

10. Which of the following elements is present as the impurity to the maximum extent in the pig iron ?

[AIPMT (Prelims)-2011]

(1) Phosphorus (2) Manganese (3) Carbon (4) Silicon

Ans. **(3)**

11. The following reactions take place in the blast furnace in the preparation of impure iron, identify the reaction pertaining to the formation of the slag **[AIPMT (Prelims)-2011]**

(1) $CaO(s) + SiO_2(s) \rightarrow CaSiO_3(s)$ (2) $2C(s) + O_2(g) \rightarrow 2CO(g)$

(3) $Fe_2O_3(s) + 3CO(g) \rightarrow 2Fe(l) + 3CO_2(g)$ (4) $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$

Ans. **(1)**

12. Match List-I (substances) with List-II (process) employed in the manufacture of the substances and select the correct option **[AIPMT (Mains)-2010]**

List - I (Substances)	**List - II (Processes)**
a. Sulphuric acid	(i) Haber's process
b. Steel	(ii) Bessemer's process
c. Sodium hydroxide	(iii) Leblanc process
d. Ammonia	(iv) Contact process

(1) a(i), b(iv), c(ii), d(iii) (2) a(i), b(ii), c(iii), d(iv) (3) a(iv), b(iii), c(ii), d(i) (4) a(iv), b(ii), c(iii), d(i)

Ans. **(4)**

13. Which of the following statements, about the advantage of roasting sulphide ore before reduction is not true?

[AIPMT (Prelims)-2007]

(1) Roasting of the sulphide to the oxide is thermodynamically feasible.

(2) Carbon and hydrogen are suitable reducing agents for metal sulphides.

(3) The $\Delta_t G°$ of the sulphide is greater than those for CS_2 and H_2S.

(4) The $\Delta_t G°$ is negative for roasting of sulphide ore to oxide.

Ans. **(2)**

14. Sulphides ores of metals are usually concentrated by Froth Floatation proces. Which one of the following sulphides ores offers an exception and is concentrated by chemical leaching ? **[AIPMT (Prelims)-2007]**

(1) Sphalerite (2) Argentite (3) Galena (4) Copper pyrite

Ans. **(2)**

15. The mass of carbon anode consumed (giving only carbondioxide) on the production of 270 kg of aluminium metal from bauxite by the Hall process is (Atomic mass Al = 27) **[AIPMT (Prelims)-2005]**

(1) 180 kg (2) 270 kg (3) 540 kg (4) 90 kg

Ans. **(4)**

Question asked Prior to Medical Ent. Exams. 2005

16. In which of the following process fused sodium chloride is electrolysed for extraction of sodium ?

(1) Castner process (2) Cyanide process

(3) Down's process (4) Both (1) & (2)

Ans. **(3)**

17. Which of the following does not contain aluminium ?

(1) Cryolite (2) Fluorspar (3) Fledspar (4) Mica

Ans. **(2)**

18. Which of the following does not contain Mg ?

(1) Magnetite (2) Asbestos (3) Magnesite (4) Carnalite

Ans. **(1)**

19. Carborundum is

(1) CaC_2 (2) $CaCO_3$ (3) Fe_3C (4) SiC

Ans. **(4)**

20. Bessemer converter is used for manufacture of

(1) Steel (2) Wrought iron (3) Pig iron (4) Cast iron

Ans. **(1)**

21. Mond's process is used for

(1) Ni (2) Al (3) Fe (4) Cu

Ans. **(1)**

22. Which process of purification is represented by following scheme ?

$$\underset{\text{(Impure)}}{Ti} + 2I_2 \xrightarrow{250^\circ C} TiI_4 \xrightarrow{1400^\circ C} \underset{\text{(Pure)}}{Ti} + 2I_2$$

(1) Poling (2) Electro refining (3) Zone refining (4) Van Arkel process

Ans. **(4)**

23. Which of the following sulphides when heated strongly in air gives the corresponding metal ?

(1) CuS (2) Fe_2S_3 (3) FeS (4) HgS

Ans. **(4)**

24. Most important ore of tin is

(1) Cassiterite (2) Cryolite (3) Malachite (4) All of these

Ans. **(1)**

25. Heating of ore in presence of air to remove sulphur impurities is called

(1) Calcination (2) Roasting (3) Smelting (4) None of these

Ans. **(2)**

26. Sodium is extracted from

(1) NaCl(aq) (2) NaCl(l) (3) NaOH(aq) (4) $NaNO_3$(aq)

Ans. **(2)**

27. Among the metals, the one that cannot be obtained by reduction of its metal oxide

(1) Cr (2) Fe (3) Mn (4) Mg

Ans. **(4)**

28. Which of the following is used as depressant in the separation of mixture of PbS and ZnS?

(1) NaCN (2) NaCl (3) AgCl (4) All of these

Ans. **(1)**

29. Which contains both iron and copper ?

(1) Cuprite (2) Chalcocite (3) Chalcopyrite (4) Malachite

Ans. **(3)**

30. To dissolve argentite ore which of the following is used ?

(1) $Na[Ag(CN)_2]$ (2) NaCN (3) NaCl (4) HCl

Ans. **(2)**

31. Iron obtained from blast furnace is

(1) Wrought iron (2) Cast iron (3) Pig iron (4) Steel

Ans. **(3)**

32. Elements used as semiconductor are purified by

(1) Van Arkel method (2) Mond process (3) Distillation (4) Zone refining

Ans. **(4)**

33. Which of the following oxide is least stable ?

(1) CO_2 (2) CO (3) MgO (4) HgO

Ans. **(4)**

34. The inner layer of a blast furnace is made of

(1) Graphite bricks (2) Silica bricks (3) Basic bricks (4) Fireclay bricks

Ans. **(4)**

35. Roasting of sulphides gives the gas X as a by-product. This is a colorless gas with choking smell of burnt sulphur and causes great damage to respiratory organs as a result of acid rain. Its aqueous solution is acidic acts as a reducing agent and its acid is known only in solution. The gas X is

(1) SO_2 (2) CO_2 (3) SO_3 (4) H_2S

Ans. **(1)**

36. Which of the following mineral contains calcium as well as magnesium ?

(1) Trydymite (2) Aragonite (3) Dolomite (4) Carnalite

Ans. **(3)**

ASSERTION & REASON QUESTIONS

These questions consist of two statements each, printed as Assertion and Reason. While answering these Questions you are required to choose any one of the following four responses.

A. **If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.**

B. **If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.**

C. **If Assertion is True but the Reason is False.**

D. **If both Assertion & Reason are false**.

1. ***Assertion*** **:** All the ores are mineral

Reason **:** Ores contains metals in combined state

Ans. **(B)**

2. ***Assertion*** **:** Ores are generally converted into oxides, prior to reduction

Reason **:** Metal oxides can be easily reduced

Ans. **(A)**

3. ***Assertion*** **:** In the extraction of Ag the complex Na $[Ag(CN)_2]$ is reacted with Zn

Reason **:** Zn is transition metal according to electronic theory

Ans. **(C)**

4. ***Assertion*** **:** In froth floatation process sodium ethyl xanthate is used as floating agent

Reason **:** Sulphide ores are water soluble

Ans. **(C)**

5. ***Assertion*** **:** Cryolite is used in electrolytic extraction of Al from alumina.

Reason **:** It dissolves alumina.

Ans. **(A)**

6. ***Assertion*** **:** $CuFeS_2$ is concentrated by froath floatation method

Reason **:** $CuFeS_2$ is main ore of copper

Ans. **(B)**

7. ***Assertion*** **:** Wolframite impurities are separated from cassiterite by electromagnetic separation.

Reason **:** Cassiterite being magnetic is attached by the magnet.

Ans. **(C)**

8. **Assertion :** Lead, tin and bismuth are purified by liquation method.

Reason : Lead, tin and bismuth have low m.p. as compared to impurities.

Ans. **(A)**

9. ***Assertion*** **:** In the smelting of copper ore coke is added in the blast furnace.

Reason **:** Coke reduces, CuO into Cu.

Ans. **(C)**

10. ***Assertion*** **:** Extraction of iron metal from iron oxide ore is carried out by heating with coke.

Reason **:** The reaction

$Fe_2O_3(s) \longrightarrow Fe(s) + 3/2O_2(g)$ is a spontaneous process.

Ans. **(C)**