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Questions:

Multiple Choice Question

1. Cupellation is a process used for the refining of_____.
   (a) Silver (b) Lead (c) Copper (d) iron
2. Which metal is used for extraction of Au and Ag and also for galvanisation of iron objects?
   (a) Mg (b) Zn (c) Cr (d) Co
3. Which of the following is not a mineral of aluminium?
   (a) Bauxite (b) Cryolite (c) China clay (d) Malachite
4. Which of the following is commonly used to produce foam in froth floatation process?
   (a) Pine oil (b) Cresol (c) NaCN (d) Xanthate
5. Among the following, one does not belong to calcination, Pick the odd one out.
   (a) $PBCO_3 \xrightarrow{\Delta} PBO + CO_2\uparrow$ (b) $CaCo_3 \xrightarrow{\Delta} Cao + CO_2\uparrow$ (c) $PbSO_3 \xrightarrow{\Delta} PbO + 2SO_2\uparrow$ (d) $ZnCO_3 \xrightarrow{\Delta} ZnO + CO_2\uparrow$
6. Which of the following is incorrect with respect to metallurgy of iron in the blast furnace?
   (a) Zone of combustion : $C + O_2 \rightarrow CO_2$ (b) Zone of heat absorption : $CO_2 \rightarrow C + O_2$ (c) Zone of slag formation : $CaO + SiO_2 \rightarrow CaSiO_3$
   (d) Zone of reduction : $Fe_2O_3 3C \rightarrow 3CO + 2Fe$
7. Name the process by which elements such as germanium, silicon and gallium are refined.
   (a) Vapour phase method (b) Electrolytic refining (c) Zone refining (d) Van-Arkel method
8. Which of the following will give respective metal by self reduction?
   (a) Galena (Pbs) (b) HgS (c) ZnS (d) Both (a) & (b)
9. Which among the following reaction represents the formation of slag?
   (a) $CaO_{(s)} + SiO_{2(s)} \longrightarrow CaSiO_{3(s)}$ (b) $2C_{(s)} + O_{2(g)} \longrightarrow 2CO_{(g)}$ (c) $Fe_2O_3 + 3CO_{(g)} \longrightarrow 2Fe_{(g)} + 3CO_{2(g)}$ (d) $CaCO_{3(g)} \longrightarrow CaO_{(s)} + CO_{2(g)}$
10. Which one of the following element is present as a impurity in pig iron?
    (a) Phosphorus (b) Manganese (c) Carbon (d) Silicon
11. In the froth-floatation process the collectors such as pine oil and xanthates, etc enhance.
    (a) Non-wettability of the mineral particles in froth. (b) Non-wettability of the mineral particles in water (c) Non-wettability of the gangue particles in froth
    (d) Non-wettability of the gangue particles in water
12. Concentration of copper glance is done by_____.
    (a) leaching (b) magnetic separation (c) froth flotation (d) hydraulic washing
13. Identify the decreasing order of carbon content in different forms of iron_____.
    (a) Wrought iron > Pig iron > cast iron (b) Cast iron > Pig iron > Wrought iron (c) Pig iron > Cast iron > Wrought iron (d) Cast iron > Wrought iron > Pig iron
14. Identify the halide ore among the following
    (a) Epsom Salt (b) Pyrolusite (c) Anglesite (d) Rock Salt
15. Identify the metal that occurs in free state.
    (a) Al (b) Au (c) Mg (d) Ca
16. $2PbS + 3O_2 \longrightarrow 2pbO + 2SO_2$ Name the process _____.
    (a) Roasting (b) Calcination (c) Smelting (d) Leaching
17. The process of heating of copper pyrites to remove sulphur is called _____.
    (a) froth flotation (b) roasting (c) calcination (d) smelling
18. ΔG^o vs T plot in the Ellingham's diagram slopes downward the reaction _____.
    (a) $Mg + \frac{1}{2}O_2 \longrightarrow MgO$ (b) $C + \frac{1}{2}O_2 \longrightarrow CO$ (c) $2Ag + \frac{1}{2}O_2 \longrightarrow Ag_2O$ (d) $2Ag + \frac{1}{2}O_2 \longrightarrow Ag_2O$
19. Pick out the alloy that contains a non-metal as a constituent in it _____.
    (a) Brass (b) Bronze (c) Steel (d) Invar
20. Ignition mixture used in aluminothermic process is _____.
    (a) Cr + AI_2O_3 (b) Mg + BaO_2 (c) AI + Cr_2O_3 (d) Ba + MgO
21. Magnetic separation it is based on the difference in the_____ of the ore and the impurities.
    (a) magnetic properties (b) chemical properties (c) physical properties (d) melting point
22. Zinc is extracted from Zinc blende by_____.
    (a) Carbon reduction process (b) Nitrogen reduction process (c) Oxygen reduction process (d) All of these
23. $ZnS + 3O_2 \xrightarrow{\Delta} 2ZnO + 2SO_2\uparrow$. The above equation is an example for_____.
    (a) calcination (b) reduction (c) roasting (d) leaching
24. Gibb's free energy is given by_____
    (a) $\Delta G^0 = -nFE^0$ (b) $\Delta G^o = nF$ (c) $\Delta G^o = nFE^o$ (d) $\Delta E^o = -nFG^0$
25. $Na[Ag(CN)_2]$ is _____.
    (a) Sodium aurocyanide (b) Sodium meta aluminate (c) Aluminosilicate (d) Sodium dicyanoargentate
26. $Zn_{(s)} + 2[Au(CN)_2]^-_{(aq)} \longrightarrow [Zn(CN)_4]^{2-}_{(aq)} + 2Au_{(s)}$ In the above equation the oxidation state of metallic gold is_____
    (a) 1 (b) 0 (c) +2 (d) -2
27. Semiconductors are purified by_____ method.
    (a) Zone refining (b) Electrolytic refining (c) Mond's process (d) Bessemerisation
28. Magnesite is_____.
    (a) Magnesium oxide (b) Magnesium carbonate (c) Magnesium sulphate (d) Magnesium chloride
29. The following set of reaction is used for refining titanium. This method is known as_____
    $Ti_{(g)} + 2I_{2(s)} \longrightarrow TiI_4\,(vapour)$

$Til_4(vapour) \longrightarrow Ti_{(g)} + 2I_{2(s)}$

(a) Hall Heroult process (b) Mond process (c) Van-Arkel process (d) Alumino thermic process

30. In the metallurgy of iron, limestone is added to coke. Which acts as a_____

(a) Reducing agent (b) Oxidising agent (c) Slag (d) Flux

31. A mixture containing sulphides of copper and iron is called_____

(a) mineral (b) ore (c) matte (d) matrix

32. Cinnabar is the sulphide ore of _____ metal.

(a) Zn (b) Pb (c) Hg (d) Ag

33. The percentage of carbon in high carbon steel is_____.

(a) 0.5 - 1% (b) 0.15 - 1.5% (c) 0.15 - 1.5% (d) 0.15 - 0.3%

34. Froth flotation process is suitable for concentrating _____ores.

(a) oxide (b) carbonate (c) sulphide (d) halide

35. Steel is an alloy of_____

(a) iron and carbon (b) iron and calcium (c) copper and carbon (d) copper and iron

36. Metal oxide is converted into metal by the _____ process.

(a) Calcination (b) roasting (c) smelting (d) bessemerisation

37. Sodium cyanide solution is used to extract _____from its ores

(a) copper (b) silver (c) gold (d) both (b) and (c)

38. In the thermite process _____is used as a reducing agent

(a) AI (b) CO (c) C (d) CO_2

39. In Hall-Heroult process _____act as an anode.

(a) Carbon blocks (b) hydrogen (c) copper rods (d) Zinc rods

40. $CaSiO_3$ is an example of _____.

(a) flux (b) slag (c) gangue (d) none

41. The oxide of metal which can be reduced by hydrogen is_____.

(a) Silver (b) lead (c) copper (d) all the above

42. Which one of the following is the ore of copper?

(a) Cuprite (b) Copper glance (c) Copper pyrite (d) All of these

43. The preliminary step in metallurgical process is _____.

(a) Roasting (b) Concentration of ore (c) Calcination (d) Smelting

44. Which one of the following reaction does not takes place on roasting?

(a) $2ZnS + 3O_2 \xrightarrow{\Delta} 2ZnO + 2SO_2 \uparrow$ (b) $P_4 + 5O_2 \xrightarrow{\Delta} P_4O_{10} \uparrow$ (c) $ZnCO_3 \xrightarrow{\Delta} ZnO + CO_2 \uparrow$ (d) $4As + 3O_2 \xrightarrow{\Delta} 2AS_2O_3 \uparrow$

45. During calcination, the water of crystallisation escapes as _____.

(a) hydrogen (b) oxygen (c) moisture (d) hydrogen peroxide

46. During acid leaching insoluble sulphide is converted into soluble _____.

(a) Sulphur dioxide (b) Sulphur trioxide (c) Sulphate (d) Sulphide

47. The alloy of copper that contain Zinc is _____.

(a) Monel metal (b) Bronze (c) Bell metal (d) Brass

48. Aluminium is used as a reducing agent in the reduction of

(a) SnO_2 (b) Al_2O3 (c) ZnO (d) MgO

49. In the extraction of copper from its sulphide Ore the metal finally obtained by the reduction of copper oxide with

(a) FeS (b) CO (c) Cu_2S (d) SO_2

50. Which of the following is a mineral of iron

(a) Pyrolusite (b) Cassiterite (c) Malachite (d) Magnetite

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