UNIT-6: GENERAL PRINCIPLES AND PROCESSES OF ISOLATION OF ELEMENTS

One mark questions:	
1. Name a carbonate ore of iron.	K
2. Name an ore that contains both iron and Cu.	U
3. Which type of ore is concentrated by froth flotation?	K
4. Name the depressant used in the separation of an ore containing ZnS and PbS?	K
5. Name the chemical reagent used in the leaching of bauxite.	K
6. What is the flux used in the extraction of iron from concentrated heamatite ore.	K
7. What is the role of silica in the metallurgy of copper?	K
8. Give the composition of copper matte.	K
9. Name the flux used to remove iron impurity from molten copper matte.	K
10. Name the reducing agent used for the extraction of iron below 1073K.	K
11. Give reason : CO becomes thermodynamically more stable as the temperature increases.	U
12. Which one of these metal is not extracted by using coke as a reducing agent? Zn, Al, Fe	U
13. What is the role of Na_3AlF_6 or CaF_2 in Hall-Heroult process?	K
14. Name the process by which copper is extracted from its low grade ores?	K
15. Complete the overall equation for the extraction of chlorine by the electrolysis of sea water (Brine): $2Cl^-_{aq} + 2\ H_2O_{(l)} \longrightarrow$	K
16. Metals having low melting point are refined by _____.	K
17. Name the method by which titanium is refined.	K
18. Is Al_2O_3 used as stationary phase or mobile phase in column chromatography?	K
Two mark questions	
1. Name the metal that is most abundant on earth's crust. Mention the principal ore from which it is extracted.	K
2. Mention the role of i) pine oil ii) cresol in froth flotation method.	K
3. The reduction of a metal oxide is easier if the metal formed is in the liquid state at the temperature of reduction. Give reason.	U
4. How is cast iron different from pig iron? How is pig iron converted into cast iron?	K
5. In Hall-Heroult process, what is the electrode at anode? It gets burnt up. Why?	U
6. Write the formula of the slag formed. i) in the extraction of iron from haematite ore ii) copper from sulphide ore	K

7. Name the two by-products obtained during the electrolysis of sea water (brine) to extract chlorine from it.	U
8. Give reason: i) Tin can be purified by liquation ii) Zinc can be purified by distillation	U
9. Name the method and principle involved in producing semiconductor of high purity.	U
10. Explain the procedure of zone refining of an element.	K
11. Nickel is purified by Mond's process. Write the equations for the reactions involved.	K
Three mark questions:	
1. Draw a labelled diagram for the extraction of aluminium from purified bauxite by Hall-Heroult process. Write the overall reaction taking place in the cell.	S
2. If iron is extracted from siderite ore, the ore is calcined, but if zinc is extracted from zinc blende, the ore is roasted. Give reasons and equation for the reaction involved in any one of the processes.	S
3. What is the significance of the following in the froth flotation process 1) Collectors 2) Stabilisers 3) Depressants?	K
4. How is pure alumina obtained from bauxite by leaching process?	K
5. Draw the Ellingham diagram for the formation of FeO from Fe, CO from C and CO_2 from CO. Suggest a suitable reducing agent for the reduction of Fe_2O_3 below 1073K and above 1073K temperature.	S
6. Draw a neat labelled diagram of blast furnace. Mark the different zones. Write the reaction taking place at slag zone.	S
7. During the conversion of cast iron into wrought iron; i) What is the lining of the reverberatory furnace made of and what is its role in the process? ii) What is the flux added?	U
8. How is copper extracted from low grade ore of it?	K
9. How is blister copper extracted from copper matte?	K
10. In the extraction of aluminium by Hall-Heroult process: i) Give the composition of the electrolyte used. ii) Write the equations for the electrolytic reactions occurring at anode and cathode.	K

11. How is gold extracted by cyanide process? Write equations.	K
12. What are the two criteria required for the 'vapour phase refining' of a metal? Name a metal purified by this technique.	K
13. Give equations for the reactions involved in the purification of zirconium by Van-Arkel process. What are the impurities associated with zirconium?	K
14. What is the principle involved in i) Hydraulic washing ii) Magnetic separation iii) Chromatography?	K
Five mark questions	
1. a) Match the following: A. Copper — Clay B. Zinc — Malachite C. Aluminium — Calamine b) Complete the following equations: i) Roasting of sulphide ore : $2Cu_2S + 3O_2 \longrightarrow$ ii) Auto reduction of Cu_2O : $2Cu_2O + Cu_2S \longrightarrow$	K
2. For the extraction of zinc from zinc blende mention / write: i. The composition of the ore ii. The method used for concentration of ore iii. The equation for the reaction involved in roasting of concentrated ore iv. Equation for the reduction of ore with coke at 1673 K v. The method used for purification of the metal.	U
3. $Au_{(in\ ore)} \xrightarrow[O_2]{NaCN_{(aq)}} X$ [complex of Au] $\xrightarrow{Zn}$ Y + Z [complex of Zn] Write the formula of X, Y, Z Identify the i) leaching agent ii) reducing agent	U
4. For the electrolytic refining of copper, a) what is the i) anode ii) cathode iii) electrolyte? b) i) What is anode mud? ii) Mention an element in it.	K