

Concept: Displacement reactions of metals

1. Copper gets deposited on the surface of the iron nail if the nail is kept immersed in copper sulphate solution. Choose the reactions that have taken place here from those given below. (2)



Score (2) Time (2 minute)

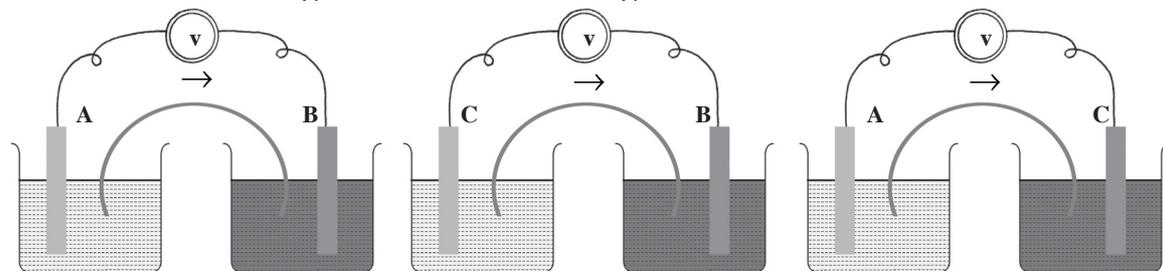
Concept: Metallurgy and reactivity series

2. Aluminium occupies a top position in the reactivity series while iron occupies a middle position. Based on the position of aluminium and iron in the reactivity series, prepare a note on the relation between the methods of manufacture of metals and their positions in the reactivity series. (2)

Score (2) Time (2 minute)

Concept: Construction of galvanic cells

3. Given below are galvanic cells involving three metals A, B and C.



- (a) Write the order of the position of these metals in the reactivity series. (1)
(b) Which metal gets reduced in the first cell? (1)
(c) Which among these cells has the highest voltage? (1)

Score (3) Time (3 minute)

Concept: Reactions of metals

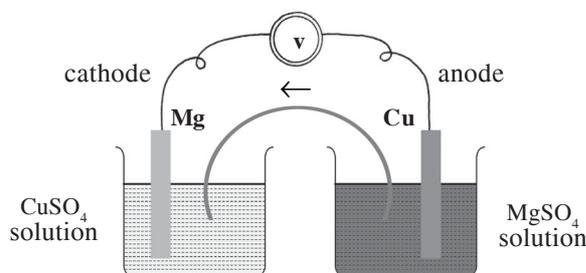
4. Give reasons for the following
(a) Sodium is stored in kerosene.
(b) Iron is not used in the manufacture of boilers used in the production of steam.
(c) CuSO_4 solution is not kept in aluminium vessels. (3)

Score (3) Time (3 minute)

Concept: Reactivity of metals and galvanic cells

- 5 Cu is placed below Mg in the reactivity series

Given below is the diagram of a galvanic cell formed between magnesium and copper. Draw the diagram by correcting the errors. Give reasons for the corrections made.

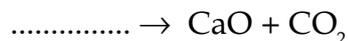
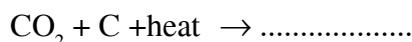


(3)

Score (3) Time (5 minute)

Concept: Production of Iron

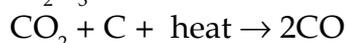
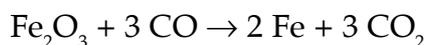
6. (a) What are the substances that are added to the blast furnace during the production of iron? (1)
- (b) Given below are equations of the chemical reactions made by these components. Complete the equations.



Score (3) Time (4 minute)

Concept: Production of Iron

7. Given below are certain chemical reactions taking place in the blast furnace during the production of iron. Arrange them in the order in which they take place.



Score (3) Time (3 minute)

Concept: Production of metals

8. (a) What type of reaction takes place during the isolation of metals in metallurgy? (Oxidation, Reduction) (1)
- (b) Electricity is used as the reducing agent during the production of aluminium. But gold, which is found in the free state can be separated easily. What is the reason for this? (2)

Score (3) Time (3 minute)

Concept: Mineral, ore

9. Aluminium can be found in clay, mica, cryolite and bauxite.
- (a) Which is the ore of aluminium among the four substances given above? (1)
- (b) Give any two requirements for a mineral to be considered as an ore. (1)
- Score (2) Time (2 minute)**
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Concept: Reactivity series and production of metals

- 10 The element gold occupies a lower position in the reactivity series. How is gold found in nature? (1)
- Score (1) Time (2 minute)**
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Concept: Production of metals

11. Bauxite is the ore of aluminium while haematite is that of iron. What is the similarity in the chemical reactions involved in the isolation of these metals from their ores? What is the difference? (2)
- Score (2) Time (2 minute)**
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Concept: Alloys

12. Alloys having the same metal components can behave differently. How is it possible to prepare alloys with different behaviour even when they contain the same components? (2)
- Score (2) Time (3 minute)**
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Concept: Production of iron

13. The iron obtained from the blast furnace is called pig iron.
- (a) How is cast iron prepared from pig iron? (1)
- (b) Write any one speciality of cast iron. (1)
- Score (2) Time (3 minute)**
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Concept: Production of metals

14. The chemical reaction $\text{CaO} + \text{SiO}_2 \rightarrow \text{CaSiO}_3$ takes place in a blast furnace. Based on this
- (a) Find out the gangue, flux and slag. Clarify each. (3)
- (b) What criteria should be adopted while selecting a flux during the production of a metal? (2)
- Score (4) Time (5 minute)**
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Concept: Production of aluminium

15. Given below are certain chemical reactions that take place during the production of aluminium from bauxite. Complete the equations.

(i) Bauxite + \rightarrow Sodium aluminate

(ii) $\text{Al}(\text{OH})_3 + \text{heat} \rightarrow \dots\dots\dots$ (2)

(iii) What are the two characteristics of aluminium that make it useful? (1)

Score (3) Time (4 minute)

Concept: Production of metals

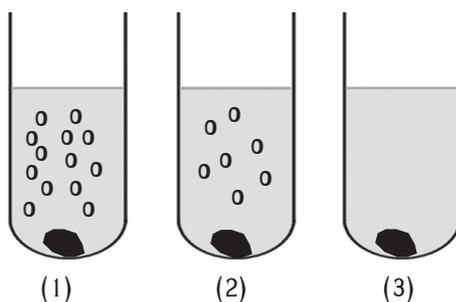
16. What change do you observe when metals like sodium, iron and gold are kept exposed to air for a long period? Explain on the basis of reactivity of these metals.

(3)

Score (3) Time (4 minute)

Concept: Reaction of metals with acids

17. The figure given below represents metal like Fe, Cu and Mg kept in dilute HCl.



(a) Which among these test tubes didn't show any reaction? Which metal was kept in that test tube? (1)

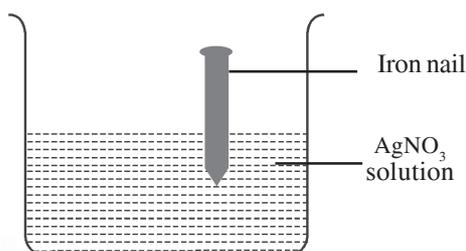
(b) Which metal is present in test tube (1)? Give equation for this reaction. (2)

(c) Arrange the given metals in the increasing order of their reactivity towards acids. (1)

Score (4) Time (4 minute)

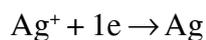
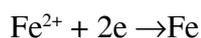
Concept: Displacement reactions, oxidation, reduction

18.



(a) What change took place on the surface of the iron nail? (1)

(b) Which among the following reactions are involved in the above change?



(2)

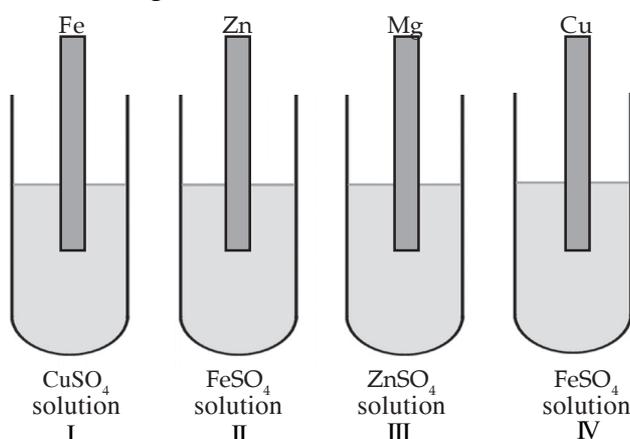
(c) Which is oxidised? Which is reduced?

(1)

Score (4) Time (4 minutes)

Concept: Substitution reactions and activity series

19. The figure given below shows certain metals kept dipped in some solutions taken in four different test tubes. Observe the figure and answer the questions. (Position in the reactivity series - Mg, Zn, Fe, Cu)



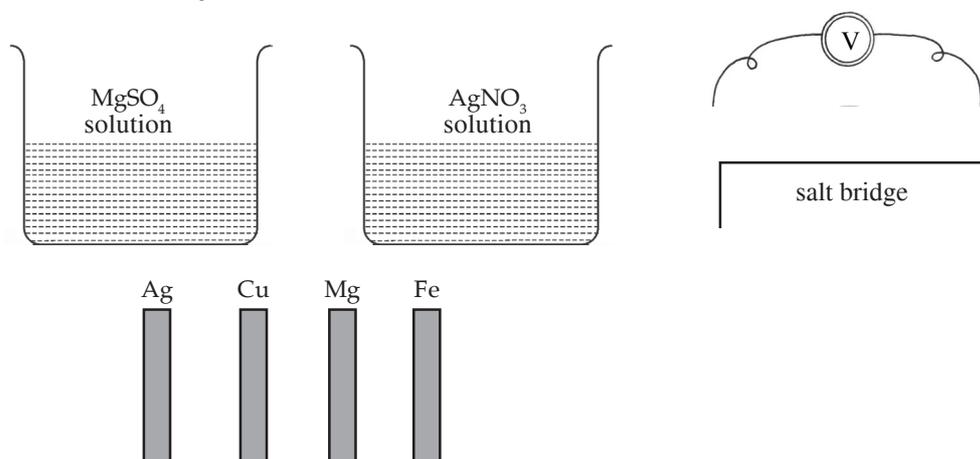
(a) What substance gets deposited on the surface of the iron rod kept dipped in the solution taken in the test tube I? What are these types of reactions called? (2)

(b) Among the solutions taken in II, III and IV, which will show this type of reaction? Justify your answer. (2)

Score (4) Time (5 minutes)

Concept: Construction of a galvanic cell

20.

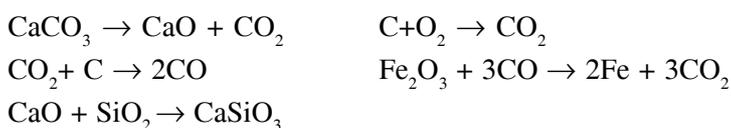


- (a) Represent the arrangement of galvanic cell using the materials given above. (2)
- (b) If the position of the above metals in the reactivity series is in the order Mg, Fe, Cu and Ag, write the anode and cathode in this case? (1)
- (c) Write the equation for the reaction taking place at the anode thus constructed. (1)

Score (4) Time (5 minute)

Concept: Production of iron

21. Given below are the reactions taking place in a blast furnace. Examine them and answer the questions given below.



- (a) Which is the ore of iron? (1)
- (b) Which compound is used for reduction of the ore? (1)
- (c) Identify the gangue, flux and slag. (2)

Score (4) Time (4 minute)

Concept: Identifying the ores of metals

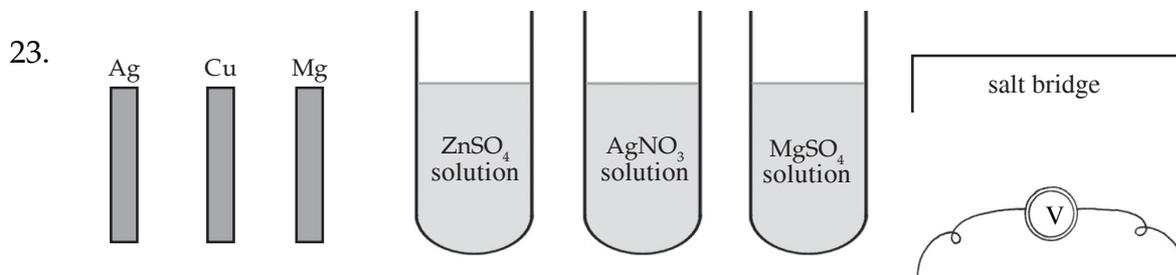
22. Analyse the table given below and match suitably.

<i>Metal</i>	<i>Ore</i>	<i>Chemical formula</i>
Sodium	Haematite	$\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$
Aluminium	Rock salt	Fe_2O_3
Iron	Bauxite	NaCl

(3)

Score (3) Time (3 minute)

Concept: Construction of a galvanic cell

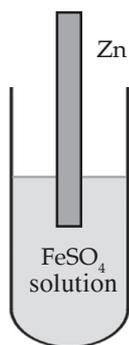


- (a) Which among these behave only as the anode when they are connected? (1)
- (b) Which are the electrodes to be used to get the maximum voltage? (1)
- (c) Draw the arrangement of the cell thus constructed. (2)

Score (4) Time (4 minute)

Concept: Position in the reactivity series and displacement reactions.

24.

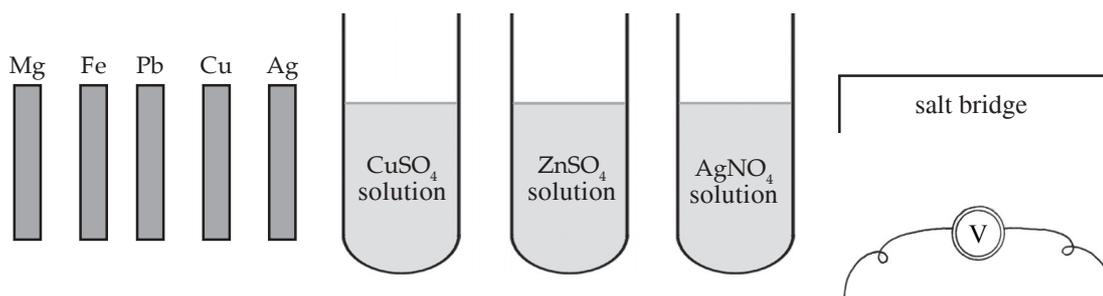


- (a) What is the reason for the decrease in the green color of FeSO_4 solution? (1)
- (b) The equation for this reaction is given below. Complete it. (1)
- $$\text{Zn} + \text{FeSO}_4 \rightarrow \dots\dots\dots + \text{ZnSO}_4$$
- (c) If Pb is used instead of Zn, no reaction takes place. From this, what inference regarding the reactivity of lead can be obtained? (2)

Score (4) Time (4 minute)

Concept: Position in the reactivity series and displacement reactions.

25.



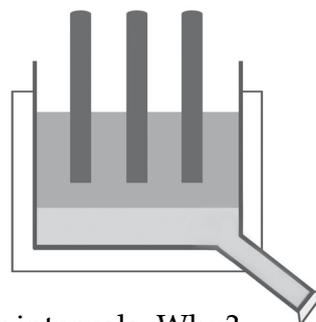
Order of reactivity is Mg, Fe, Pb, Cu, Ag

- (a) Represent the cell using the suitable metal rods and solutions. (2)
- (b) Mark the direction of flow of electrons. (1)
- (c) Mark the anode and cathode. (1)

Score (4) Time (3 minute)

Concept: Production of aluminium

26.



- (a) Mark the anode and cathode. (1)
- (b) The carbon rods need to be replaced at regular intervals. Why? (1)
- (c) At which electrode is aluminium set free? Write the equation for the chemical reaction taking place at that electrode. (2)

Score (4) Time (3 minute)