

Match List I with List II.

LIST I		LIST II	
A.	Reverberatory furnace	I.	Pig Iron
B.	Electrolytic cell	II.	Aluminum
C.	Blast furnace	III.	Silicon
D.	Zone Refining furnace	IV.	Copper

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(1) A – IV, B – II, C – I, D – III

(2) A – I, B – IV, C – II, D – III

(3) A – I, B – III, C – II, D – IV

(4) A – III, B – IV, C – I, D – II

Q2 - 24 January - Shift 2

The metal which is extracted by oxidation and subsequent reduction from its ore is :

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(1) Al

(2) Ag

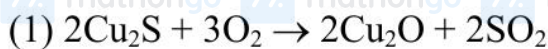
(3) Cu

(4) Fe

Q3 - 25 January - Shift 1

Which one of the following reactions does not occur during extraction of copper ?

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Q4 - 25 January - Shift 2

## of Metals

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Given below are two statements :-

**Statement I :-** In froth floatation method a rotating paddle agitates the mixture to drive air out of it.

**Statement II :-** Iron pyrites are generally avoided for extraction of iron due to environmental reasons.

In the light of the above statements, choose the correct answer from the options given below :-

- (1) Both Statement I and Statement II are true
- (2) Statement I is false but Statement II is true
- (3) Statement I is true but Statement II is false
- (4) Both Statement I and Statement II are false

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**Q5 - 29 January - Shift 1**

The reaction representing the Mond process for metal refining is \_\_\_\_\_

- (1)  $\text{Ni} + 4\text{CO} \xrightarrow{\Delta} \text{Ni}(\text{CO})_4$
- (2)  $2\text{K} [\text{Au}(\text{CN})_2] + \text{Zn} \xrightarrow{\Delta} \text{K}_2 [\text{Zn}(\text{CN})_4] + 2 \text{Au}$
- (3)  $\text{Zr} + 2\text{I}_2 \xrightarrow{\Delta} \text{Zr I}_4$
- (4)  $\text{ZnO} + \text{C} \xrightarrow{\Delta} \text{Zn} + \text{CO}$

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**Q6 - 29 January - Shift 2**

The major component of which of the following ore is sulphide based mineral?

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- (1) Calamine
- (2) Siderite
- (3) Sphalerite
- (4) Malachite

**Q7 - 30 January - Shift 1**

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In the extraction of copper, its sulphide ore is heated in a reverberatory furnace after mixing with silica to :

- (1) separate CuO as  $\text{CuSiO}_3$
- (2) remove calcium as  $\text{CaSiO}_3$
- (3) decrease the temperature needed for roasting of  $\text{Cu}_2\text{S}$
- (4) remove FeO as  $\text{FeSiO}_3$

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**Q8 - 30 January - Shift 2**

**Statement I:** During Electrolytic refining, the pure metal is made to act as anode and its impure metallic form is used as cathode.

**Statement II:** During the Hall-Heroult electrolysis process, purified  $\text{Al}_2\text{O}_3$  is mixed with  $\text{Na}_3\text{AlF}_6$  to lower the melting point of the mixture.

In the light of the above statements, choose the **most appropriate** answer from the options given below:

- (1) Statement I is incorrect but Statement II is correct
- (2) Both Statement I and Statement II are incorrect
- (3) Statement I is correct but Statement II is incorrect
- (4) Both Statement I and Statement II are correct

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**Q9 - 31 January - Shift 1**

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The methods NOT involved in concentration of ore are

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- (A) Liquation
- (B) Leaching
- (C) Electrolysis
- (D) Hydraulic washing
- (E) Froth floatation

Choose the correct answer from the options given below :

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

**Q10 - 31 January - Shift 2**

Which one of the following statements is incorrect ?

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- (1) Boron and Indium can be purified by zone refining method.
- (2) Van- Arkel method is used to purify tungsten.
- (3) Cast iron is obtained by melting pig iron with scrap iron and coke using hot air blast.
- (4) The malleable iron is prepared from cast iron by oxidising impurities in a reverberatory furnace.

**Q11 - 01 February - Shift 1**

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Given below are two statements: one is labelled as

**Assertion A** and the other is labelled as **Reason R**

**Assertion A:** In an Ellingham diagram, the oxidation of carbon to carbon monoxide shows a negative slope with respect to temperature.

**Reason R:** CO tends to get decomposed at higher temperature.

In the light of the above statements, choose the correct answer from the options given below

- (1) Both A and R are correct and R is the correct explanation of A
- (2) A is not correct but R is correct
- (3) Both A and R are correct but R is NOT the correct explanation of A
- (4) A is correct but R is not correct

**Q12 - 01 February - Shift 2**

Among following compounds, the number of those present in copper matte is \_\_\_\_\_.

- A.  $\text{CuCO}_3$
- B.  $\text{Cu}_2\text{S}$
- C.  $\text{Cu}_2\text{O}$
- D.  $\text{FeO}$

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Questions with Solutions

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# Answer Key

(As per Official NTA Key released on 2 Feb)

Q1 (1)

Q2 (2)

Q3 (3)

Q4 (2)

Q5 (1)

Q6 (3)

Q7 (4)

Q8 (1)

Q9 (3)

Q10 (2)

Q11 (4)

Q12 (3)

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## Questions with Solutions

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Reverberatory furnace: Used for roasting of Copper.

Electrolytic cell : For reactive metal : Al

Blast furnace : Hematite to Pig Iron

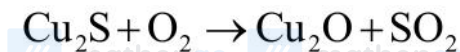
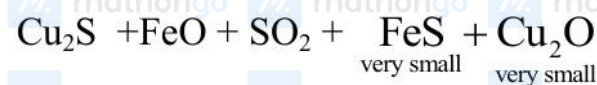
Zone Refining furnace: For semiconductors : Si

## Q2 (2)

Ag.



## Q3 (3)



No formation of calcium silicate ( $\text{CaSiO}_3$ ) in extraction of Cu.

## Q4 (2)

In froth floatation method a rotating paddle draws in air and stirs the pulp.

## Q5 (1)

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Mond's process uses:

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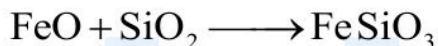
Q6 (3)

Calamine :  $\text{ZnCO}_3$ Siderite :  $\text{FeCO}_3$ Sphalerite :  $\text{ZnS}$ Malachite :  $\text{CuCO}_3 \cdot \text{Cu(OH)}_2$ 

Q7 (4)

The copper ore contains iron, it is mixed with silica before heating in reverberatory furnace. FeO slags

off as  $\text{FeSiO}_3$ .



Q8 (1)

In Electrolytic refining, the pure metal is used as cathode and impure metal is used as anode.

$\text{Na}_3\text{AlF}_6$  is added during electrolysis of  $\text{Al}_2\text{O}_3$  to lower the melting point and increase conductivity.

Q9 (3)

Methods involved in concentration of one are

(i) Hydraulic Washing

(ii) Froth Flotation

(iii) Magnetic Separation

Q10 (2)

Van – Arkel process is used for purification of Ti, Zr, Hf and B.

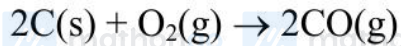
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## Questions with Solutions

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$\Delta_r S^\circ$  is +ve,  $\Delta_r G^\circ = \Delta_r H^\circ - T\Delta_r S^\circ$ ; thus slope is negative

As temperature increases  $\Delta_r G^\circ$  becomes more negative thus it has lower tendency to get decomposed.

Q12 (3)

FeS and  $Cu_2S$ , present in copper matte

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