

Unit 9 - Week 7

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Assignment 7

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2020-11-04, 23:59 IST.

1) First element to get oxidized in BOF. 2 points

- a. Fe
- b. C
- c. Mn
- d. Si

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

a.

2) Sequence of removal of impurities in BOF steel making process. 2 points

- a. Si, Mn, C, P
- b. Si, Mn, P, C
- c. Si, C, P, Mn
- d. Si, C, Mn, P

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

b.

3) Select the correct statement(s): 2 points

- a. Temperature of slag is always slightly lower than that of the metal.
- b. The concentration of CaO in the slag increases continuously during the blow.
- c. Dephosphorization increases monotonically with increase in FeO in slag.
- d. At the end of blow the FeO concentration increases in slag because C-O reaction subsides.

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

b.

d.

4) The nozzle used in the lance of LD steel making process is 2 points

- a. Convergent
- b. Divergent
- c. Convergent-divergent
- d. Divergent-convergent

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

c.

5) Electric arc furnace steel making in small scale industries has the following features: 2 points

- a. manufacture alloy steel
- b. it runs on cold charge
- c. environment friendly
- d. can remove sulphur

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

a.

b.

d.

6) The advantages of 6 nozzle oxygen lance compared to single nozzle lance are: 2 points

- a. Better lining life
- b. More coolant can be accepted
- c. Low phosphorus content in the liquid bath
- d. Low Mn content in the liquid bath.

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

a.

b.

c.

7) Top & bottom combined blowing in L.D. converter using oxygen & inert argon results in comparatively 2 points

- a. Higher FeO in slag.
- b. Higher slopping during blowing.
- c. More scrap melting capability.
- d. Higher phosphorus partitioning

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

c.

d.

8) The parameter(s) that help in reducing silicon content in hot metal is/are: 2 points

- a. decrease in hot metal temperature
- b. increase in high top pressure
- c. decrease in basicity in slag
- d. Stronger burden material

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

a.

b.

9) To treat low phosphorus hot metal during LD process, identify the correct process step(s): 2 points

- a. Decarburization should continue until the end of the refining.
- b. Basic slag should form early in the process by adding mill scale
- c. Decarburization should start from the onset of the process
- d. Dephosphorization should follow later in the process when basic slag forms

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

a.

c.

d.

10) Which of the followings are relevant to the recent advances of EAF steelmaking 2 points

- a. Foamy slag practice
- b. Double slag practice
- c. UHP transformer
- d. DC arc furnace

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

a.

c.

d.

11) Identify the hybrid process where CO₂ is injected from bottom in a BOF furnace. 2 points

- a. LDAC/OLP
- b. OBM-P
- c. K-BOP
- d. STB

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

d.

Common data for question 12 to 14

In BOF blow, the decarburization rate is maximum due to slag-metal emulsion formation. Assume: the emulsion contains 8% of bath steel as droplets. The droplets of metal are spherical. 1 tonne of steel and density of steel is 730 kg/m³. The size distribution of droplets are as follows:

Diameter (d),mm	0.2	1	2	5	10
Fraction of total number (N) of droplets	0.05	0.2	0.5	0.2	0.05

12) Calculate total number of droplets. 3 points

- a. 2.51 × 10⁵
- b. 2.86 × 10⁵
- c. 3.32 × 10⁵
- d. 2.25 × 10⁵

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

b.

13) Calculate the total weight of droplets diameter 0.2 mm. 2 points

- a. 4.03 × 10⁻⁴ kg
- b. 9.01 × 10⁻⁴ kg
- c. 4.03 × 10⁻³ kg
- d. 9.01 × 10⁻³ kg

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

a.

14) Calculate the fractional weight of droplets diameter 10 mm. 2 points

- a. 0.41
- b. 0.31
- c. 0.52
- d. 0.63

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

d.

Common data for question 15 to 18

For a BOF heat the following data are given: Hot metal contains 1.0% Si, 0.15% P, 0.25% Mn and 3.5% C. Weight of scrap is 10% of hot metal. Assume scrap is pure iron. Steel at tap contains 0.2% C. Slag has 54% CaO, 18% FeO, 2.5% MnO, 2.5% MgO and CaO/SiO₂ = 3.2. Average exit gas composition over the entire heat is 10%CO₂ and 90% CO. Assume 1 tonne of steel is produced.

15) Calculate weight of the hot metal charge. 4 points

- a. 988 kg
- b. 966 kg
- c. 940 kg
- d. 920 kg

- a.
 b.
 c.
 d.

No, the answer is incorrect. Score: 0

Accepted Answers:

b.

16) Calculate weight of slag produced. 1 point

- a) 132 kg
- b) 140 kg
- c) 110 kg
- d) 123 kg

- a)
 b)
 c)
 d)

No, the answer is incorrect. Score: 0

Accepted Answers:

d)

17) Calculate required CaO. 1 point

- a) 74 kg
- b) 66 kg
- c) 58 kg
- d) 50 kg

- a)
 b)
 c)
 d)

No, the answer is incorrect. Score: 0

Accepted Answers:

b)

18) Calculate required oxygen. 4 points

- a) 46 Nm³
- b) 59 Nm³
- c) 36 Nm³
- d) 68 Nm³

- a)
 b)
 c)
 d)

No, the answer is incorrect. Score: 0

Accepted Answers:

a)