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Unit 4 - Iron Making Week 2

Assignment 2

The due date for submitting this assignment has passed. **Due on 2018-02-28, 00:00 IST.**

Submitted assignment

1) Data for Questions 1 to 3: ***1 point***

Blast volume = 6000 m^3-STP/min

Blast temperature=1200^{0}C

PCI rate=170 kg/THM

Wind consumption=1200 m^3/THM

The Raceway Adiabatic Flame Temperature (RAFT) in ^{0}C is approximately:

- 2000
- 1900
- 2200
- 2300

No, the answer is incorrect.
Score: 0

Accepted Answers:
2200

2) It is now decided to increase the PCI rate to 310kg/THM. The RAFT now is: ***1 point***

- About 9% lower than before
- About 3% higher than before
- About 9% higher than before
- About 3% lower than before

No, the answer is incorrect.
Score: 0

Accepted Answers:
About 9% lower than before

3) Which of the following processes could increase the RAFT back to its original value (approximately) keeping the PCI rate at 310kg/THM? ***1 point***

- Reduce blast temperature by 1000^{0}C
- Inject blast with 25% Oxygen (Oxygen enrichment)
- Both first and second processes
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:

Interactive Session with Students

Inject blast with 25% Oxygen (Oxygen enrichment)

4) Questions 4 to 7: True or False: ***0.25 points***

Preheating of the blast air results in reduction in the consumption of coke.

- True
- False

No, the answer is incorrect.
Score: 0

Accepted Answers:
True

5) ***0.25 points***

The exhaust gas of the blast furnace has high calorific value and therefore it is used in preheating the air.

- True
- False

No, the answer is incorrect.
Score: 0

Accepted Answers:
True

6) ***0.25 points***

The moisture content in the sinter mixture and the amount of fuel (coke breeze) in the sinter mixture determine the rate of forward travel of flame front.

- True
- False

No, the answer is incorrect.
Score: 0

Accepted Answers:
True

7) ***0.25 points***

At the end of the agglomeration process, the kind of structure formed is known as snowball structure.

- True
- False

No, the answer is incorrect.
Score: 0

Accepted Answers:
True

8) Green balls produced during pelletization: ***0.25 points***

- Have high strength
- Have low strength
- Can be used directly as blast furnace feed
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Have low strength

9) What property of the exhaust gas of the blast furnace makes it useful further? ***0.25 points***

- Good calorific value
- High temperature
- High pressure
- High content of fines

No, the answer is incorrect.
Score: 0

Accepted Answers:
Good calorific value

10) Which of the following iron oxides is an oxygen-deficient non-stoichiometric compound? ***0.25 points***

- Hematite
- Magnetite
- Wustite
- all of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Wustite

11) Which of the following zones is a maximum temperature region in the sinter bed? ***0.25 points***

- Ignition period
- Cooling of sinter
- Flame front
- Combustion zone

No, the answer is incorrect.
Score: 0

Accepted Answers:
Flame front

12) The difference in the preheating zone above and below the combustion zone as it travels from top to bottom of the sinter bed is as follows: ***0.5 points***

- Above and below the combustion zone, preheating of sinter bed takes place.
- Above the combustion zone, preheating of the sinter bed takes place and below it preheating of air takes place.
- Above and below the combustion zone, preheating of air takes place.
- Above the combustion zone preheating of air takes place and below it preheating of sinter bed takes place.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Above the combustion zone preheating of air takes place and below it preheating of sinter bed takes plac

13) Acidic sinter has the following properties: ***0.5 points***

- Fayalite is a major phase.
- No limestone addition.
- Weak sinter.
- Both first and second properties.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both first and second properties.

14) The feed size in pelletization is: ***0.5 points***

- -10 to +3 mm
- +3 mm
- 50 microns and above
- About 50 microns and below.

No, the answer is incorrect.
Score: 0

Accepted Answers:
About 50 microns and below.

15) Calculate the approximate equilibrium constant and CO/CO_2 ratio for reduction of wustite to iron by CO at 900^0C given that the Gibbs free energy change of the reaction is 9.5kJ. ***0.5 points***

- 1.5 and 0.3
- 2.5 and 0.4
- 0.3 and 1.5
- 0.4 and 2.5

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.4 and 2.5

16) An ore containing 45% Fe_2O_3 and 55% SiO_2 is subjected to magnetic separation. After separation, the tailing consists of 80% SiO_2 and concentrate consists of pure magnetite. If the mass flow rate of the ore is 1ton/hr, find the mass flow rate of magnetite in the tailing and concentrate. ***1.5 points***

- 137.5 kg/hr and 312.5 kg/hr
- 117.5 kg/hr and 112.5 kg/hr
- 147.5 ton/hr and 312.5 ton/hr
- 137.5 ton/hr and 412.5 ton/hr

No, the answer is incorrect.
Score: 0

Accepted Answers:
137.5 kg/hr and 312.5 kg/hr

17) The input is admitted to the sintering plant at 1 ton/hr and consists of 10% flue dust, 70% ore, 10% coke and 10% water. 25% loss of volatiles from the sinter was found. Calculate the loss of volatiles and amount of sinter produced. ***1.5 points***

- 150 kg/hr and 450 kg/hr
- 200 kg/hr and 550 kg/hr
- 250 kg/hr and 750 kg/hr
- 300 kg/hr and 650 kg/hr

No, the answer is incorrect.
Score: 0

Accepted Answers:
250 kg/hr and 750 kg/hr

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