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B.E. / B.Tech. (Full Time) ARREAR EXAMINATIONS, NOV / DEC 2012

MATERIALS SCIENCE AND ENGINEERING BRANCH

FOURTH SEMESTER – (REGULATIONS 2008)

ML 9252 – PRIMARY PROCESSING OF IRON AND STEEL

Time : 3 hrs Max Marks: 100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1. How are the iron ores classified based on the gangue associated with them?
2. What are the effects of Silicon in pig iron?
3. How does the angle of repose of ore particles affect the burden distribution?
4. Differentiate between direct and indirect reduction reactions.
5. What is the need for Gas cleaning in Blast furnace operation?
6. What are the reactions that take place in the bosh region of the Blast furnace?
7. What are the functions of Checker works in regenerative chambers?
8. Mention the various ways of degassing the steel.
9. Write down the differences between bottom blown and top blown Bessemer converters.
10. What are the advantages of DC arc furnace over AC arc furnace?

Part – B (5 x 16 = 80 Marks)

11. a. Explain the various methods of Beneficiation of iron ores.

12. a. Describe in detail the various stages of blast furnace operation.

(OR)

b. (i) What are the various ways by which the blast furnace productivity can be increased? Explain. (8)

b. (ii) Describe the various steps in charging the raw materials into the furnace with neat sketches. (8)

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13. a. (i) Explain the principles involved in steel making processes. (8)

(ii) Explain in detail the Stora Kaldo process of steel making process. (8)

(OR)

b. Describe in detail the Bottom blown Oxygen process for steel making with neat sketch.

14. a. Explain the construction of Bessemer vessel with neat diagram.

(OR)

b. Describe the constructional features of Open Hearth furnace.

15. a. Explain the steel making by Basic electric arc furnace. Give the important reactions that occur during the process. Explain the merits and demerits of the above process.

(OR)

b. Discuss the following. (4 x 4 = 16)

(i) Continuous steel making

(ii) Capped steels

(iii) Vacuum degassing

(iv) Teeming practice in steel making

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