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Total number of printed pages – 2

B. Tech
PCMT 4303

Sixth Semester Regular Examination – 2014

IRON MAKING

BRANCH(S) : MM, MME

QUESTION CODE : F 224

Full Marks – 70

Time : 3 Hours

*Answer Question No. 1 which is compulsory and any **five** from the rest.
The figures in the right-hand margin indicate marks.*

1. Answer the following questions :

2 × 10

- B/F iron making is a countercurrent process. Justify.
- Give a typical composition of Indian Pig Iron.
- B/F is the best place for sulphur removal-why ?
- What do you mean by super-fluxed sinter ?
- Justify the need of non-uniformity in the cross-section of B/F throughout its height.
- What do you mean by back draughting ?
- What is channelling ?
- What do you mean by “on gas” and “on blast” in B/F stove ?
- What is sponge iron ?
- Discuss about the utilization of blast-furnace slags.



- What is the principle of sintering ? Briefly describe the process in Dwight Lloyd sintering machine. 5
- What factors are considered for evaluation of an iron ore ? 5

P.T.O.

3. (a) Differentiate between Direct and Indirect reduction. State their importance in B/F iron making. 5
- (b) Explain, in detail, why the Indian steel industry is very interested in the commercial production of sponge iron, rather than being dependent solely on the blast-furnace route. 5
4. Explain, in detail, the three stage cleaning of Blast-furnace gas with suitable sketches. 10
5. (a) Define basicity and available base. Find out the available base of a flux with 97% CaCO_3 and 3% SiO_2 to obtain slag basicity of 1.5. 5
- (b) Find out the bosh slag basicity of a blast-furnace with following data assuming that 70% of the coke is burnt at the tuyeres with no silica reduction.
- (i) Iron ore: 64% Fe, 5.5% SiO_2
- (ii) Coke: 600kg/TMH, ash=10% with 45% SiO_2 in it
- (iii) Pig Iron: 92% Fe and Final slag basicity (CaO/SiO_2):1.1 5
6. (a) What is the requirement of auxiliary fuel in B/F ? Briefly describe about PCI. 5
- (b) Draw the Fe-O-C equilibrium diagram including the Boudouard curve and comment on the iron ore reduction inside the blast-furnace. 5
7. (a) How Oxygen enrichment and Humidification of blast help in B/F productivity ? 5
- (b) How blowing in operation is carried out ? 5
8. Write short notes on any **two** : 5×2
- (a) Bell less charging system
- (b) Reducibility of iron ores
- (c) Burden permeability
- (d) Ring formation in rotary kiln.

