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Total number of printed pages – 2

B. Tech.
PCMT 4303

Sixth Semester Examination – 2013

IRON MAKING

BRANCH : MME/MM

QUESTION CODE : A 156

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
- (a) What is the role of CO in B/F iron making ?
 - (b) What is agglomeration ? Name two processes.
 - (c) List the required amount of raw materials for production of 1 ton of pig iron.
 - (d) What is the effect of carbon deposition reaction on the bed permeability of B/F burden ?
 - (e) What is Boudouard equilibrium ?
 - (f) What do you mean by available base ?
 - (g) Why is basicity of bosh slag higher than final slag ?
 - (h) What is Ferro-coke ?
 - (i) What do you mean by fanning ?
 - (j) Why does ring formation occur in Rotary Furnace ?

P.T.O.

2. (a) Draw a neat sketch of B/F with required labeling. Give the reactions taking place in the stack. 5
- (b) Briefly describe with suitable sketches how coarse and fine cleaning of B/F gas is carried out. 5
3. (a) What is topo-chemical reaction ? Describe w.r.t. Iron ore reduction with required sketch. 5
- (b) With the following data find out the bosh slag basicity of a blast furnace producing pig iron with 92 % Fe assuming that 70 % of the coke is burnt at the tuyeres with no silica reduction. 5
 - (i) Iron ore: 50% Fe, 14% SiO₂
 - (ii) Coke : 750 kg/TMH, ash = 20% with 45% SiO₂ in it
 - (iii) Final slag basicity (CaO/SiO₂) : 1.1
4. Describe pelletisation technique and different process variables in brief. 10
5. (a) What is sponge iron ? Give the physico-chemical reactions of DR process. 5
- (b) With a neat sketch describe the HyL process in brief. 5
6. (a) What is HTP ? Describe its requirement and application in B/F. 5
- (b) Differentiate between Bell and Bell less charging systems of B/F. 5
7. (a) Explain the construction and functioning of a modern blast furnace gas stove. 5
- (b) What is scaffolding ? Mention its causes and remedies. 5
8. Write short notes on any **two** of the following : 5×2
 - (a) Desulphurisation
 - (b) Tapping
 - (c) Auxiliary fuel injection
 - (d) Utilization of blast furnace slags.