Registration No : | | | | | | | | | | |

Total Number of Pages : 01 **B.Tech.**
PCMT4303

6th Semester Back Examination 2017-18
IRON MAKING
BRANCH : METTA, MME
Time : 3 Hours
Max Marks : 70
Q.CODE : C426

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

Q1 **Answer the following questions :** **(2 x 10)**

a) Find out the theoretical % of Fe in Hematite and Magnetite.
b) What is Boudouard equilibrium?
c) What do you mean by topo-chemical reaction?
d) Define the terms (with respect to B/F)
i. Campaign
ii. Tapping
e) What is available base?
f) Draw a neat sketch of B/F with labelling along with material flow in and out.
g) Differentiate between direct and indirect reduction.
h) Basicity of bosh slag is higher than final slag-why?
i) Give a typical composition of Indian Pig Iron.
j) B/F is the best place for sulphur removal-why?

Q2 **a)** What factors are considered for evaluation of an iron ore? **(5)**
b) Draw a neat sketch of B/F with required labelling and describe the six internal zones. **(5)**

Q3 **a)** Explain the construction and functioning of a modern blast furnace gas stove. **(5)**
b) Explain in detail the 3 stage cleaning of Blast furnace gas with suitable sketches. **(5)**

Q4 **a)** Describe two bell charging system in blast furnace. **(5)**
b) Find out the % CO_2 in CO-CO_2 mixture in equilibrium with Fe_2O_3-Fe_3O_4 at 727°C. Given: **(5)**
$3Fe_2O_3+CO=2Fe_3O_4+CO_2$ $\Delta G°= - 32969.92 - 53.85T$ J

Q5 **a)** What is sponge iron? Give the physico-chemical reactions of DR process. **(5)**
b) With a neat sketch describe the SL/RN process in brief. **(5)**

Q6 **a)** Explain the role of Rist diagram in iron making. **(5)**
b) How Oxygen enrichment and Humidification of blast help in B/F productivity? **(5)**

Q7 Describe pelletisation technique and different process variables in brief. **(10)**

Q8 **Write short answer on any TWO :** **(5 x 2)**

a) Fe-C-O phase diagram
b) Blowing in
c) Hanging
d) Bell less charging system