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Total Number of Pages: 02

B.Tech
PCMT4402

7th Semester Regular / Back Examination 2016-17

STEEL MAKING
BRANCH:METTA,MME

Time: 3 Hours

Max Marks: 70

Q.CODE: Y347

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) What do you mean by autogenous Steel making process?
- b) What is sub lance?
- c) Why LD process is so fast?
- d) Lime slag is well suited for low carbon heats in EAF-Justify.
- e) What is diameter of electrode spacing in EAF?
- f) What is the role of oxy-fuel burner in EAF?
- g) What is the importance of oreing in open hearth?
- h) Lime stone is used as partial replacement of lime in OBM- Justify.
- i) What is SEN?
- j) What is the role of an inactive mixture in an integrated steel plant?

Q2 Chemistry of input and output materials for LD process is as follows: (10)

Element, %	Hot Metal	Scrap	Steel to be produced
C	3.5	0.20	0.15
Si	1.20	0.02	0.01
Mn	0.75	0.40	0.25
P	0.40	0.04	0.03
S	0.04	0.04	0.03

Lime contains 94.5% CaO, 2.5% MgO, 1.5% SiO₂, and 1.5% Al₂O₃. Lime and Scrap are charged @ 50kg and 200kg respectively per ton of steel production. Considering 1.5% Fe loss w.r.t. steel production, calculate:

- i. Amount of hot metal to be charged per ton of steel production
- ii. Amount of slag produced

Q3 a) Describe one heat of LD process with suitable figures. (5)

b) Describe with a neat sketch the impurity elimination curve of LD process. (5)

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Q4 a) Describe different types of slag in EAF with special reference to double slag practice. **(5)**

210 210 **b)** DRI can be a good substitute for scrap –justify. **(5)** 210

Q5 a) What is continuous casting of steel? Mention the special features of curved mould (S-type) continuous casting. **(5)**

b) Describe the metallurgy and modern developments of OBM process. **(5)**

210 210 **Q6 a)** What are the points to be considered to choose the best deoxidizer? Describe the mechanism of deoxidation. **(5)** 210

b) Explain the principles and metallurgical aspects of stainless steel making. **(5)**

Q7 Describe the carbon reaction in detail and its importance in steel making. **(10)**

210 210 210 210 210 210 210 210
Q8 Write short answer on any TWO: (5 x 2)

a) Non-metallic inclusion

b) Oxygen transport in open hearth process

c) LDAC

210 210 **d)** R-H process 210 210 210 210 210 210