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Total Number of Pages: 02

B.TECH
PCMT4402

7th Semester Regular / Back Examination 2015-16

STEEL MAKING

BRANCH: MM,MME

Time: 3 Hours

Max marks: 70

Q CODE: T110

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

- Q1 Answer All the Questions: (2 x 10)**
- Steel making is reverse of iron making- Justify.
 - What is the effect of FeO content in slag on Dp?
 - Differentiate deoxidation from degassing.
 - What is Catch carbon technique?
 - Write down two advantages of continuous casting over ingot casting.
 - What do you mean by critical level of carbon in LD?
 - What do you mean by autogenous Steel making process?
 - Mention two advantages of inert gas blowing.
 - What do you mean by killed, semi killed and rimming steels?
 - Differentiate between pig iron, cast iron and steel?
- Q2 (10)**
- Hot metal of composition 0.8% Si, 0.2% P, 0.25% Mn, 4% C and rest iron is refined in a converter to produce steel of composition 0.1% C and rest iron. Pure oxygen is blown. During refining scrap is charged whose amount is 15% of hot metal. The composition of slag is CaO 54%, FeO 18%, and MnO 2.5%, with $CaO/SiO_2=3.5$. Exit gases analyses 15% CO_2 and 85% CO. Calculate amount of steel, slag and waste gases per ton hot metal.
- Q3 a) What are the raw materials for steel making in LD process? (5)**
Schematically illustrate one heat in LD.
- b) What are the points to be considered to choose the best deoxidizer? (5)**
Describe the mechanism of deoxidation
- Q3 a) Explain different slag types and their role in EAF. (5)**
- b) Mention the causes for which the Open hearth process is obsolete. (5)**

- Q5 a) Describe the principle of vacuum degassing. Compare and contrast R-H process and D-H process. (5)
b) Describe the construction and metallurgy of OBM process. (5)
- Q6 a) What is continuous casting of steel? Mention the special features of curved mould (S-type) continuous casting. (5)
b) Describe LDAC process of steelmaking with suitable sketch? How is it different from LD? (5)
- Q7 a) What is non-metallic inclusion? Mention its type, effects on steel quality and methods for inclusion control. (5)
b) Describe the carbon reaction in detail and the importance of carbon boil in steel making. (5)
- Q8 Write short notes on (any two) (5 x 2)
a) Deoxidation practice
b) Foamy slag practice
c) Molecular theory of slag
d) Characteristic Mn Hump