B.E. (Met.) Part - III 6 th Semester Final Examination, April 2010

STEEL MAKING AND FERRO-ALLOY TECHNOLOGY

(MT-601)

Time: 3 hours **Full Marks: 70**

[Answer Question No. 1 and Any Four (04) from the Rest]

1. Complete the following sentences: -
   a) S and P removal are possible in basic EAF, because_____.
   b) Use of gaseous oxygen in basic EAF steel making increases the_____.
   c) Spiegel is used as_____in steel making.
   d) Viscosity of slag increases with_____FeO content.
   e) For alloying purpose, Fe-Ni can be added at any stage in steel making because_____.
   f) Deep drawing is not suitable for steel made by_____process.
   g)_____Law explains the solubility of Nitrogen in steel.
   h) High Phosphorus in steel induces_____.
   i) Phosphorus in steel is found as_____.
   j) Objective of vacuum refining of liquid steel is to reduce the amount of_____.

2. Explain the characteristics of L.D. process of steel making. (15)

3. Discuss about the advantages & limitations of continuous casting of steel over conventional ingot casting methods. (15)
   What is primary and secondary cooling in continuous casting of steel- Explain?
   Explain the term Negative Stripping in continuous casting and state its beneficial effects.
   What are the advantages of using Tundish in the continuous casting of steel?

4. Write notes on: a) Laddie Metallurgy c) Induction Furnace steel making, d) Vacuum degassing of liquid steel, e) Production of low carbon ferroalloys, e) The effect of Jet Force Number in the L.D. process.
   (3 x 5 = 15)

5. Distinguish the following : - (3 x 5 = 15)
   a) Oxidising, Lime and Carbidic slag.
   b) AOD & VOD process.
   c) Eccentric shape of L.D. converter is preferred over concentric one.
   d) Three-nozzle lance and Single- nozzle lance in L.D. process.
   e) Dry slag and Wet slag.

6. Explain the following: - (3 x 5 = 15)
   a) Why Phosphorus rich slag must be removed from liquid steel bath before adding Deoxidisers?
   b) Why Nitrogen content of the bath tend to rise in the after blow period of Basic Bessemer Process?
   c) Although FeO is a basic oxide, why it cannot help in desulphurisation?
   d) Effect of CaF_2 on the viscosity of basic slag during steel making.
   e) 20 to 25 % of the metal is charged as scrap in L.D. process.

7. What have been the major drivers for the growth of Secondary Refining Processes? (4 + 8 + 3 = 15)
   Explain the operating principal and capabilities of any vacuum refining process.
   What would be the most popular secondary refining process when vacuum treatment of steel is not required?

8. What is meant by sustainable development? (4 + 3 + 8 = 15)
   What is the impact of steel industry on environment degradation?
   Explain the interventions taken up by steel industries to minimise damage to environment.