

**NATIONAL INSTITUTE OF TECHNOLOGY TIRUCHIRAPPALLI**

**Dept. of Metallurgical and Materials Engineering**

Question paper for Semester Examination

B.Tech.: MME VI Sem. and MME VIII Sem.; and Chem Engg. VIII sem.

**MT 462 LADLE METALLURGY AND CONTINUOUS CASTING** (Elective) (F slot)

Monday, May 5 2014, **2:00 pm to 5:00 pm** Max. Marks: **50**

1. (a) Why do steel plants opt for additional treatments (beyond the LD converter) for producing ULC / IF grades of steels? (2)  
(b) Consider the production of any one specialized grade of steel, such as free cutting steel / Titanium stabilized stainless steel / ball bearing steel / wire rod steel. Describe, in detail, how an understanding of metallurgical thermodynamics helps you overcome problems encountered during the production of such grade of steel. (8)
2. (a) List any four elements / compounds suitable for deoxidation. (2)  
(b) Provide indicative chemical composition for any one type of slag encountered during secondary treatment OR continuous casting of steel. (2)  
(c) Describe, in detail, any one theoretical / experimental approach being used to estimate / measure any one property of slags. (6)
3. (a) What is a tundish? (2)  
(b) What is “sequence casting”? (2)  
(c) Explain, in detail, how the levels of Chromium and Carbon are controlled, during the production of stainless steels? (6)
4. (a) What are mould powders / mould fluxes (context of CC)? (2)  
(b) Provide indicative cross sectional dimensions for any two among the three concast sections listed here: slab / bloom / billet. (4)  
(c) Describe, briefly, any two operational / quality problems encountered during continuous casting. (4)
5. (In the context of paper on mould simulator for continuous casting) (already circulated)  
(a) What is a mould simulator? (2)  
(b) What kind of information can be generated by performing an experiment with continuous casting mould simulator? (8)