Code No: 07A60605 **R07** **Set No. 2**

III B.Tech II Semester Examinations,APRIL 2011
STEEL MAKING
Metallurgy And Material Technology

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. What are the various charge materials used in LD process of steel making? Discuss about them. [16]

2. (a) Describe capped steels.
   (b) Depending upon the extent of deoxidation explain various ingots. [4+12]

3. (a) Explain the differences between top and bottom blown converter processes.
   (b) Discuss the sequence of oxidation of different elements in a basic Bessemer-convertor.
   [8+8]

4. Write short notes on :
   (a) Mould Materials
   (b) Bottom plate
   (c) Hot tops. [16]

5. (a) Discuss about Electro magnetic stirring in continuous casting of steel making.
   (b) What are the cut off devices in a continuous casting machine?
   (c) Describe how oxidation during continuous casting of steel is prevented ? [4+4+8]

6. (a) Explain about the following oxidising agents used in steel making process.
      i. Iron oxide
      ii. Aiz
      iii. Oxygen gas
   (b) Write a short note on 'Mini-steel plants' in India. [9+7]

7. (a) What are the important slag properties that are of interest to extractve metallurgists? Explain them in detail.
   (b) Explain about V-ratio and modified V-ratio.
   (c) What are the important sources of oxidising agents, in the steel making process? Explain. [7+4+5]

8. Write short notes on :
   (a) Skin effect
   (b) Furnace lining in Induction furnace

(c) Inductor in Induction furnace [4+6+6]

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Code No: 07A60605 **R07** **Set No. 4**

III B.Tech II Semester Examinations,APRIL 2011
STEEL MAKING
Metallurgy And Material Technology

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Discuss about Tandem furnace and dual hearth furnaces in steel making process. [16]

2. Explain the following with sketches
   (a) AOD process of steel making
   (b) VAD process of steel making
   (c) Triplex process [5+5+6]

3. With the help of a neat sketch, describe Kaldo process giving a note about plant operation, hot metal charge, process control, sequence of removal of impurities, limitations of the process etc. [16]

4. (a) Describe Coreless Induction furnace and the process taking place in it.
   (b) What are the advantages and limitations of Coreless Induction furnace? [10+6]

5. (a) What is secondary steel making ? Classify the various processes.
   (b) What are the aims of secondary steel making ?
   (c) Discuss stirring treatments in secondary steel making processes. [5+5+6]

6. Write short notes on the following used in continuous casting of steel making :
   (a) With drawal rolls
   (b) Water sprays
   (c) Dummy bar [4+6+6]

7. Write short notes on :
   (a) Deoxidation practice
   (b) Casting pit design [8+8]

8. (a) Why do MgO and S_iO_2 Contents of limestone (flux) must be as low as possible? Explain.
   (b) Explain what do you mean by Calcined lime.
   (c) Why Bessemer and BOF processes are called as pneumatic processes? Explain.
   (d) Explain about autogeneous process of steel making. [5+3+4+4]

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Code No: 07A60605 **R07** **Set No. 1**

III B.Tech II Semester Examinations,APRIL 2011
STEEL MAKING
Metallurgy And Material Technology

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Describe any two continuous steel making processes. Expalin their advantages and limitations. [16]
2. With help of neat figueres describe the various electrode support assemblies of an electric arc furnace for steel making. [16]
3. Compare the different continuous casting of steel processes. [16]
4. (a) What is tundish teeming ?
   (b) What are the advantages and disadvantages of tundish teeming ?
   (c) Describe tundish teeming parctice. [4+6+6]
5. (a) Define and explain sievert's law.
   (b) Discuss the principle of deoxidation of steels, and explain the regular practice of deoxidation of steels in steel making industries. [5+11]
6. (a) Compare and contrast ancient processes of steel making with modern processes with reference to process and equipment.
   (b) Explain how the following factors affect the efficiency of steel making operation:
      i. Energy consumption
      ii. Cost of raw-materials used. [10+6]
7. (a) Describe induction stirring of ladle degassing process.
   (b) Compare and contrast R-H and D-H processes. [8+8]
8. Discuss the construction and operatiional features for the following
   (a) Twin hearth furnace
   (b) Tilting open hearth furnace. [8+8]

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Code No: 07A60605 **R07** **Set No. 3**

III B.Tech II Semester Examinations,APRIL 2011
STEEL MAKING
Metallurgy And Material Technology

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) With the help of a neat sketch explain the curved mold casting machine and the process taking place in it.
   (b) What are the characteristic features of the curved mold casting machine? [12+4]
2. (a) What are the aims of vacuum treatment of steels ?
   (b) What is the principle of vacuum treatment of steel ?
   (c) What are the general considerations in vacuum treatment of steel ? [6+5+5]
3. (a) List out the important applications of steel produced by cementation process. Also explain why this steel used for such applications.
   (b) Distinguish between iron making and steel making. [8+8]
4. (a) What is teeming of steel ?
   (b) What factors affect teeming temperature of steel ?
   (c) What are the functions of a teeming ladle ? [4+6+6]
5. (a) Explain how oxidation of carbon is different from the oxidation of rest of the impurities.
   (b) What is meant by external dsiliconisation? Explain the oxidation of Si and Mn from pig iron during steel making practice. [8+8]
6. (a) Describe the various methods of treatment of steel in ladles.
   (b) Explain in detail the metallurgy of oxygen bottom blowing process. [8+8]
7. (a) Explain the nitrogen problem in Bessemer steel making practice giving reasons and methods to minimise/eliminate such problems.
   (b) How the use of liquid fuels, in place of gaseous fuels, simplifies design and construction of open hearth furnace. [8+8]
8. (a) Compare carbon and graphite electrodes.
   (b) What are the required properties of electrodes ?
   (c) What factors affect electrode consumption ?
   (d) What are the different charge materials for Electric Arc Furnace ? [4+4+4+4]

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