Code No: RR321804 **Set No. 1**

III B.Tech II Semester Regular Examinations, Apr/May 2006
IRON PRODUCTION
(Metallurgy & Material Technology)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) How iron and steel was manufactured in ancient India? Explain in detail. [8]
   (b) Describe the historical evidence of iron making processes? [8]
2. (a) What are the constituents of charge arrangements of a modern blast furnace?
   (b) What do you understand by uptake, down comer & bleeder value of blast furnace gas cleaning system? Explain [5+11]
3. (a) How many types of Hoistening applications are these? Explain any one. [8]
   (b) What are the precautions that are required to be taken during the construction of blast furnace? [8]
4. (a) Describe the physical structure of a blast furnace. [8]
   (b) Describe the reactions in Tuyere zone of blast furnace. [8]
5. (a) Explain the physical characteristics of the blast furnace slags? [8]
   (b) How the disposal of slag is carried out by the Indian steel plants? [8]
6. (a) What are the precautions to be taken for a newly lined blast furnace? [7]
   (b) Describe the process of 'Banking' in blast furnace. [9]
7. (a) What is the importance of 'Pre-reduced ore as burden in the blast furnace?[8]
   (b) Describe the process of 'Injection of reducing gas' at the bottom of stack? [8]
8. (a) What are the alternative routes of Iron production? Describe any one. [8]
   (b) Explain the iron production in a low shaft furnace with the help of a neat sketch [8]

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Code No: RR321804 **Set No. 2**

III B.Tech II Semester Regular Examinations, Apr/May 2006
IRON PRODUCTION
(Metallurgy & Material Technology)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe various alternative methods of iron production. [8]
   (b) Explain the occurrence and distribution of iron ores in India. [8]
2. (a) Mention all the parts of a blast furnace. Explain any one of them. [9]
   (b) What are the chief causes of blast furnace refractory failure? Explain. [7]
3. Write short notes on
   (a) Foundation of blast furnace [8]
   (b) Bosh angle of blast furnace [8]
4. (a) Describe the physical structure of a blast furnace. [8]
   (b) Describe the reactions in Tuyere zone of blast furnace. [8]
5. (a) What are the basic functions of the slag in a modern blast furnace? [6]
   (b) What are the various constituents of blast furnace slags? [3]
   (c) What are the effects of CaO, SiO_2, AlO_3&MgO on fluidity of slags? [7]
6. (a) What are the precautions to be taken for a newly lined blast furnace? [7]
   (b) Describe the process of 'Banking' in blast furnace. [9]
7. (a) What are the latest developments in Bell construction and operation in the modern blast furnace? Describe them [8]
   (b) What are the advantages of 'Higher blast temperature' in blast furnace? [4]
   (c) What is the importance of oxygen enrichment of blast in the blast furnace? [4]
8. (a) How many types of sponge Iron production are there? Explain any one type. [8]
   (b) Describe the physical chemistry of DR process. [8]

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Code No: RR321804 **Set No. 3**

III B.Tech II Semester Regular Examinations, Apr/May 2006
IRON PRODUCTION
(Metallurgy & Material Technology)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the Dwight Lloyd sintering machine in the modern Iron making. [8]
   (b) What are the parameters, which affect the efficiency of sintering machines? Explain [8]
2. (a) Mention all the parts of a blast furnace. Explain any one of them. [9]
   (b) What are the chief causes of blast furnace refractory failure? Explain. [7]
3. (a) How many types of Hoistening applications are these? Explain any one. [8]
   (b) What are the precautions that are required to be taken during the construction of blast furnace? [8]
4. (a) Describe the reactions in Stack zone of blast furnace. [8]
   (b) Explain the kinetics of Iron oxide reduction in blast furnace. [8]
5. (a) What are the basic functions of the slag in a modern blast furnace? [6]
   (b) What are the various constituents of blast furnace slags? [3]
   (c) What are the effects of CaO, SiO_2, AlO_3&MgO on fluidity of slags? [7]
6. (a) Draw a neat sketch of variable stock line armaer (cylindrical design) and Explain. [8]
   (b) Draw a neat sketch of variable stock line armaer (conical design) and Explain. [8]
7. (a) What are the latest developments in Bell construction and operation in the modern blast furnace? Describe them [8]
   (b) What are the advantages of 'Higher blast temperature' in blast furnace? [4]
   (c) What is the importance of oxygen enrichment of blast in the blast furnace? [4]
8. (a) Explain the process of coal based DR process [5]
   (b) Explain the production of wrought Iron. [6]
   (c) What are the advantages and disadvantages of wrought Iron? [5]

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Code No: RR321804 **Set No. 4**

III B.Tech II Semester Regular Examinations, Apr/May 2006
IRON PRODUCTION
(Metallurgy & Material Technology)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the major deposits and occurrence of Iron ores in the world. [8]
   (b) Where are the various steel plants located in India? Give their installed capacities and other details
2. (a) What are the constituents of charge arrangements of a modern blast furnace?
   (b) What do you understand by uptake, down comer & bleeder value of blast furnace gas cleaning system? Explain [5+11]
3. (a) What are the advantages of attaching hot blast stove to a blast furnace. [8]
   (b) What are the benefits of modern improvements in the blast furnace construction? [8]
4. (a) Describe the physical structure of a blast furnace. [8]
   (b) Describe the reactions in Tuyere zone of blast furnace. [8]
5. (a) Explain the physical characteristics of the blast furnace slags? [8]
   (b) How the disposal of slag is carried out by the Indian steel plants? [8]
6. (a) What are the precautions to be taken for a newly lined blast furnace? [7]
   (b) Describe the process of 'Banking' in blast furnace. [9]
7. (a) How 'High top pressure' helps in improving production? Explain. [8]
   (b) What are the charging devices for 'high top pressure' in blast furnace? Explain [8]
8. (a) How many types of sponge Iron production are there? Explain any one type. [8]
   (b) Describe the physical chemistry of DR process. [8]

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