Total Pages—4

(Set-V_1)

B.Tech - 6th(M & M)
Iron Making

Full Marks : 70

Time : 3 hours

Answer six questions including Q. No. 1 which is compulsory

The figures in the right-hand margin indicate marks

Symbols carry usual meaning

1. Answer *all* questions : 2 × 10

(a) Desulphurization.

(b) Direct reduction process

(c) Blowing-in and blowing-out

(d) Auxiliary fuel injection in blast furnace

(e) Humidification of the blast

(f) Fuel efficiency

(g) Coke rate

(h) Banking of blast furnace

(i) Disc and Drum pelletizer

(j) Fuel injection through tuyeres.

2. (a) Discuss in detail the construction of a blast furnace along with a labelled sketch of the blast furnace explaining the functions of major parts. 5

(b) Discuss the occurrence of iron ores in India. 5

3. (a) Discuss reactions in stack, tuyere, bosh and hearth regions of the blast furnace. 5

(b) Discuss the design of hot blast stoves using appropriate figures. 5

4. (a) What are the steps involved in the preparation of ores for blast furnace charge ? 5

(b) Discuss the advantages of the blast furnace cooling system. 5

5. (*a*) Define coke and what are the properties that determine the value of coke as a blast furnace fuel ? 5

(*b*) Define sintering. Explain the principle, process variables and mechanism of sintering. 5

6. (*a*) What is beneficiation of iron ores and what are its advantage ? Also, give a detailed account on the methods used for the beneficiation of Iron ores. 5

(*b*) Explain how oxygen injection in a blast furnace improves it operation ? 5

7. (*a*) Discuss the formation of different types of slag in a blast furnace. 5

(*b*) Discuss the role of coke and limestone in iron making. 5

8. Write short notes on any *two* : 5×2

(*i*) Ferro-alloys

(*ii*) Low shaft furnace

(*iii*) Electrothermal process for iron making

(*iv*) Blast furnace refractories.
