FURNACE

(1.) CRUCIBLE FURNACE :

- Used for Low Melting point materials.
- Used for production of Non-ferrous materials.
- for small melting of material.

charge : Ore + flux + fuel
(Pig Iron) ($CaCO_3$)

(2.) Cupola furnace :

- Used for melting pig Iron.
- Large quantities of cast iron can be produced.

Electric Arc furnace :

- Large quantities of ferrous materials ~~life~~ like steel can be produced by melting pig Iron.

(4.) Induction furnace :

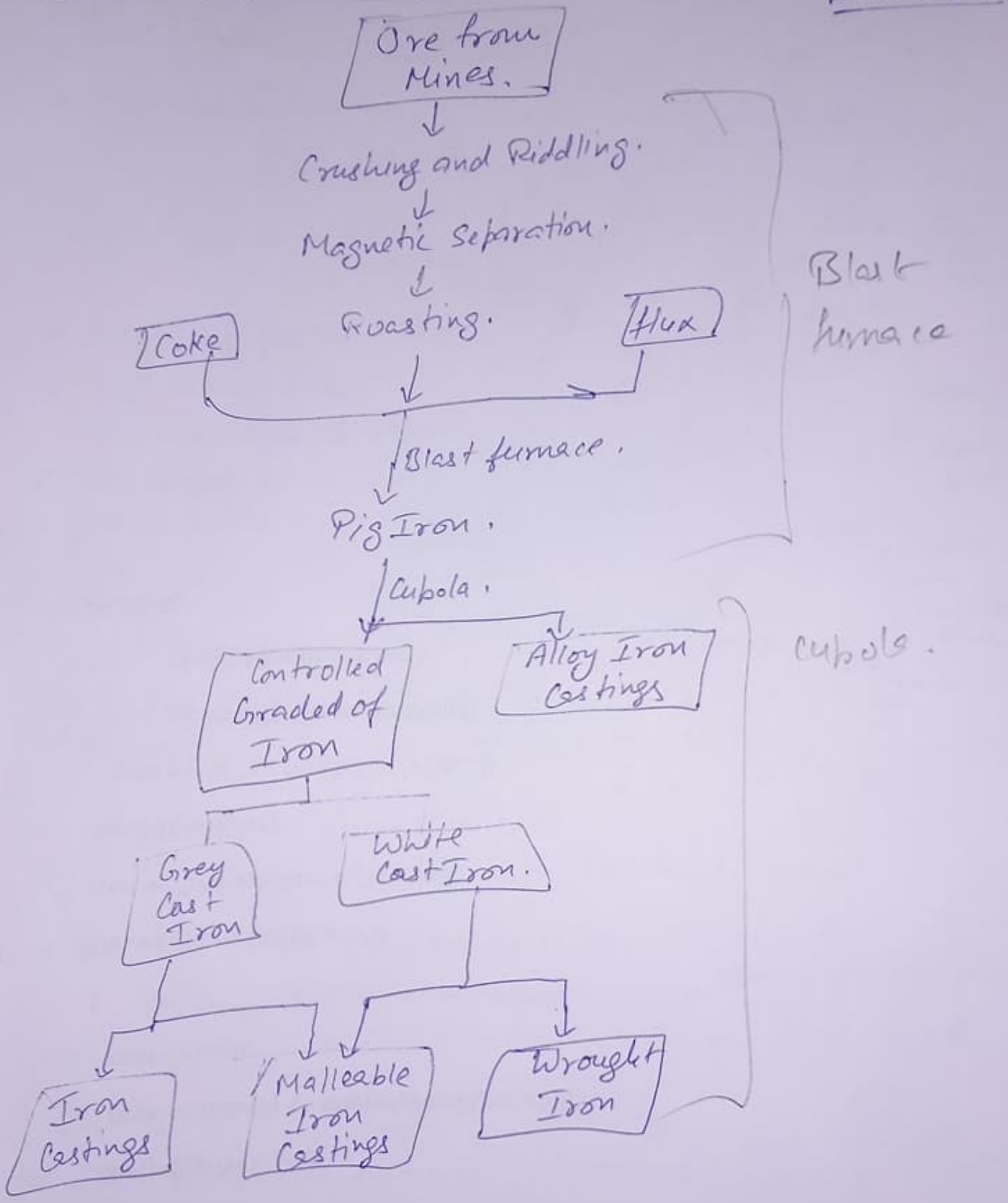
- For melting of ferrous & non-ferrous material, in small and large quantities.
- Rate of melting is high.
- Space requirement is less.
- Cost of melting is more.

ROUGH SHEET

Name of Candidate: _____ Date: _____

Roll Number: _____ Batch Time: _____

Various Stages in the manufacture of different ferrous products.



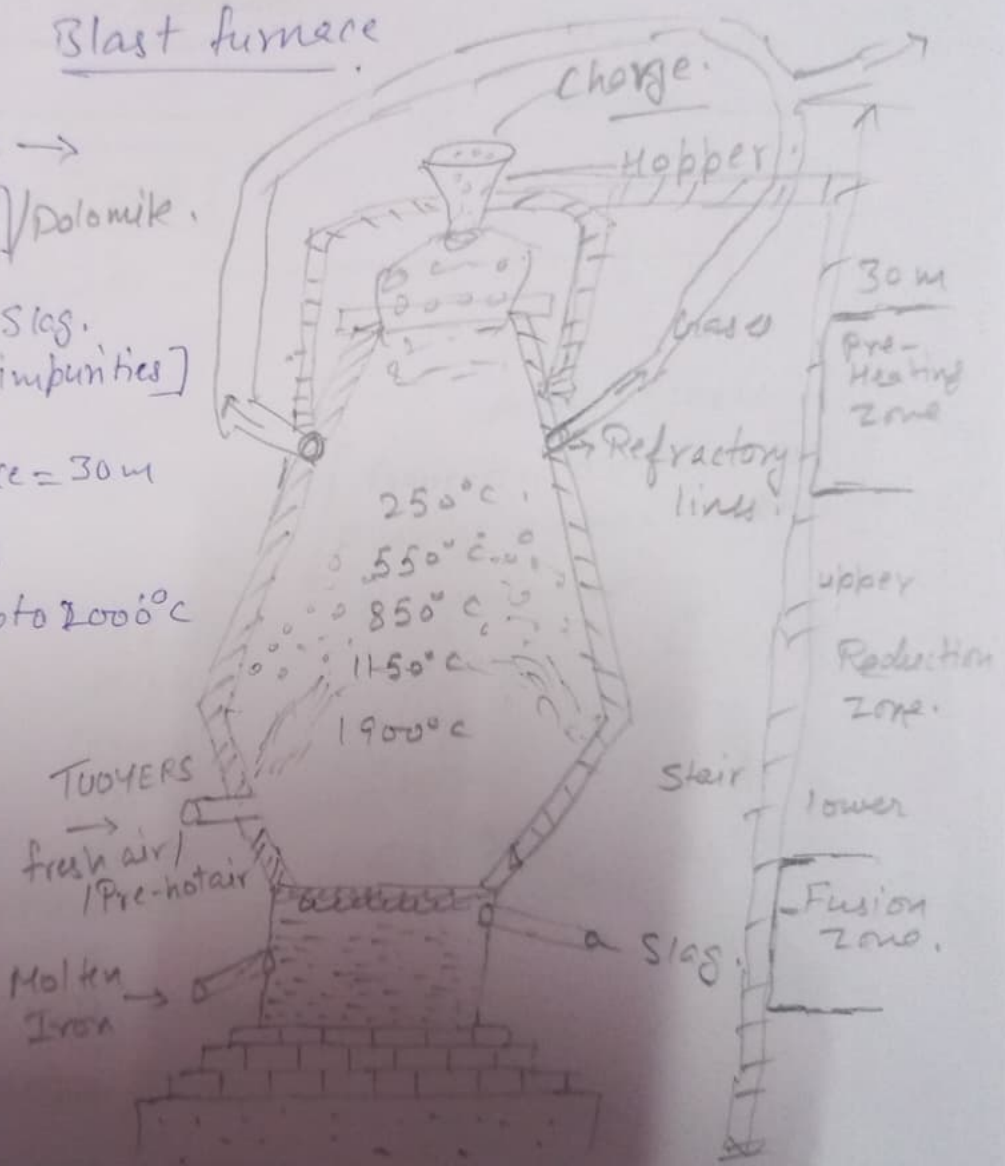
Blast furnace

one tonne + 500kg to 750kg

* Iron Ore + flux → [lime stone / Dolomite.]

→ Pig Iron + Slag. [impurities]

* Height of furnace = 30m
* Refrectory lines can bear temp. upto 2000°C
* Pre-heated air strikes with Ore and create a blast in furnace, is called blast furnace.



* Largest Blast furnace in U.K.
Capacity = 6,000 tonne/day

* Largest Blast furnace in U.K.
Capacity = 60,000 tonnes/week

* Hot air burns coke, produce CO.

~~$Fe_2O_3 + 3CO \rightarrow 2Fe$~~ $\rightarrow$ (B) lower reduction Zone.

(i) Hot air + Carbon Content $\xrightarrow{C}$ Carbon Mono-oxide $\xrightarrow{CO_2}$ $2CO$.

(a) $Fe_2O_3 + 3CO \rightleftharpoons 2Fe + 3CO_2$

* High temp. decomposes Limestone.

(b) $CaCO_3 \rightarrow CaO + CO_2$.

(A) Upper reduction zone $\rightarrow$ 350°C - 700°C

(ii) $CaO + SiO_2 \rightarrow CaSiO_3$.

Impurities. Calcium Silicate. Slag.

other impurities. $P_2O_5 / MnO_2 / SiO_2$

(iii) $Fe_2O_3 + 3C \rightarrow 2Fe + 3CO$

Pig Iron.

(C) fusion zone.