Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH(CT)/SEM-8/CT-801D/2010

2010

STEEL PLANT REFRACTORIES

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

i) Theory of liquid state sintering was introduced by

a) Narasimhan and Kingery

b) Norton and Kingery

c) R.L. Coble and Kingery

d) None of them.

ii) Theory of solid state sintering was introduced by

a) Kingery b) R. L. Coble

c) Kuezynski d) none of them.

iii) Theory of intermediate stage of sintering was introduced by

a) Coble and Gupta

b) Kingery and Coble

c) Johnson and Gupta

d) None of them.

iv) Ideal condition to achieve theoretical density of alumina when grain growth is

a) normal

b) abnormal

c) combination of normal and abnormal

d) none of these.

v) Nature of bonds present in soft agglomerates of ceramic powders is

a) ceramic bonding

b) van der Waals bonding

c) combination of both (a) and (b)

d) none of these.

vi) During precipitation process, the precipitate usually contains

a) one type of metal ion

b) two types of metal ions

c) more than two types of metal ions

d) none of these.

vii) To achieve best performance, coked porosity of MgO - C bricks should have

a) 7 - 8% b) 10 - 12%

c) 14 – 16% d) none of these.

viii) Silica content of DMMC bricks used in RH-Degaser for best performance is

a) ≤ 0·8 wt% b) ≤ 2·0 wt%,

c) ≥ 2 wt% d) none of these.

ix) Suitable MgO - C bricks used in LD - converter to achieve best performance have

a) % A.P. – 1·0 (tempered) and % A.P. – 10% (coked)

b) % A.P. – 3·0 (tempered) and % A.P. – 8% (coked)

c) % A.P. – 2·0 (tempered) and % A.P. – 7% (coked) and

d) none of these.

x) Refractory used for working lining of Tundish is

a) L.C.C. - 70

b) U.L.C.C. - 70

c) 70% cement free castable

d) none of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Discuss briefly the requirement of properties of Silica bricks for Coke oven to achieve life more than 30 years.

3. Discuss briefly the properties of L.C.C. – 70 for its uses in steel plant.

4. Discuss briefly the advantages and disadvantages of edge pressing over flat pressing for lining of refractories in steel ladles.

5. Discuss briefly properties of DBM used in MgO – C bricks used for Slag Zone of steel Ladle.
6. Discuss briefly properties of H.A bricks used in Blast Furnace as bottom blocks to achieve longer life.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. Define L.D. converter. Write its function in steel melting shop. What types of refractories are used in its working lining. Discuss briefly the properties of such types of bricks. State some important properties of raw materials for making such bricks. 2 + 4 + 2 + 7
8. Discuss the function of A.O.D. unit. What type of bricks are used in its working lining. Describe briefly how such bricks are produced in the plant. State some of its properties. 4 + 2 + 6 + 3
9. What is Zone lining ? Why one type of bricks are not used in steel ladle ? Discuss briefly the properties of different types of bricks in metal zone, slag zone and bottom zone of steel ladle. 4 + 3 + 8
10. Discuss briefly, properties of bricks used in V.O.D unit. Name different raw materials used to manufacture these bricks and also state some of their properties. Describe how such bricks are produced in the slant. 4 + 2 + 4 + 5
11. What are Ladle shrouds, nono blocks and sub-entry nozzles ? State their functions. Discuss different refractories used in both permanent and working lining of Tundish. State some inclining of Tundish. State some important properties of refractories used in Tundish that are used as working lining. 3 × 1 + 3 × 1 + 5 + 4