Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(CT)/SEM-6/CT-601/2010

2010

REFRACTORIES – II

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 : $10 \times 1 = 10$

   i) Binder used in MgO – C bricks is

      a) dextrine

      b) carboxy methyl cellulose

      c) liquid resin

      d) none of these.

   ii) Fused magnesia has better corrosion resistance than sinter magnesia because it has

      a) lower grain size

      b) larger grain size

      c) higher % closed pores

      d) none of these.

   iii) Indian DBM is not suitable in MgO – C bricks because it has

      a) high CaO content b) high SiO_2 content

      c) low silica content d) none of these.

iv) Secondary carbon yield of pitch bonded MgO – C bricks is

a) equal to resin bonded bricks

b) less than resin bonded bricks

c) more than resin bonded bricks

d) none of these.

v) Coked porosity of Al_2O_3 – MgO – C bricks is

a) more than tempered porosity

b) less than tempered porosity

c) equal to tempered porosity

d) none of these.

vi) Cement content in L.C.C. is

a) 5-8% b) 10-11%

c) 2-4% d) none of these.

vii) Cr_2O_3 use is limited in L.C.C. due to

a) higher cost

b) non-availability

c) environmental restriction

d) none of these.

viii) Binder used in self flow castables is

a) $e - Al_2O_3$ b) $\beta - Al_2O_3$

c) colloidal silica d) none of these.

ix) Raw material used for formulating insulating castable which can be used above 1600°C is

a) perlite b) vermiculite

c) bubble alumina d) none of these.

x) Castable refractries have higher thermal shock resistance than shaped refractories because of

a) thin structure b) higher porosity

c) higher density d) none of these.

GROUP – B
(Short Answer Type Questions)

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

2. What are the materials added as drying aid in the castable refractories and why ? How do they help in drying the castable refractories ?

3. What type of heating schedule is followed in castable refractories ?

4. What are the salient features of ULCC ? What are the applications of ULCC ?

5. State the difference of tempered and coked properties of MgO – C bricks.

6. Discuss briefly properties of different raw materials used for making Al_2O_3 – MgO – C bricks.

GROUP – C
(Long Answer Type Questions)

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

7. a) What is the binder of NCC ? What are the characteristics of this type of binder ?

   b) How does this binder develop green strength as well as high temperature strength in NCC ?

   c) What are the disadvantages of using this type of binder in NCC ?

   d) How is workability of such castables maintained ?

4 + 4 + 4 + 3

8. a) What is gel bonded castables ?

   b) What are the advantages of gel bonded castables over LCC and ULCC ?

   c) What are the characteristics of gel bonded castables ?

   d) What are the applications of gel bonded castables ?

   2 + 5 + 3 + 5

9. Why do MgO – C bricks have much better performance than burnt magnesia bricks ? Discuss briefly physicochemical properties of DBMS for making quality MgO – C bricks. Discuss briefly how Al_2O_3 – MgO – C bricks are produced in the plant. 3 + 6 + 6

10. What are pure oxide refractories ? Name the raw materials and their proporations to make + 99% Al_2O_3 bearing dense bricks for hydrocarbon process industries. Discuss briefly how such bricks are produced in the plant. State some of its important properties. 2 + 4 + 6 + 3

11. Write short notes on any *three* of the following : 3 × 5

    a) Ramming refractories and their uses

    b) Ultra low cement castables

    c) Hydraulic binders used in castable refractories

    d) Dolo-carbon bricks

    e) Pitch bonded and resin bonded MgO – C bricks.