		<u>Uiegh</u>
Name :	•••••	\A/
		(Andrew Series
Invigilator's Sigr	nature :	
	CS/B.Tech(C	T)/SEM-6/CT-601/2010

### 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.

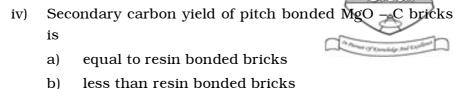
#### **GROUP - A**

### (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.

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- c) more than resin bonded bricks
- d) none of these.
- v) Coked porosity of Al 2 O 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%

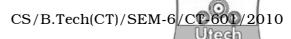
b) 10-11%

c) 2-4%

- d) none of these.
- vii)  $\operatorname{Cr}_2\operatorname{O}_3$  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)  $e Al_2 O_3$
- b)  $\beta Al_2 O_3$
- 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.

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# GROUP – B ( Short Answer Type Questions )

Answer any three of the following.



- 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 MgOC bricks.
- 6. Discuss briefly properties of different raw materials used for making Al  $_2$  O  $_3\,$  MgO C bricks.

## GROUP – C

### (Long Answer Type Questions)

Answer any *three* of the following.

- $3 \times 15 = 45$
- 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

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- 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  $_2$  O  $_3$  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 $_2$ O $_3$  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 :  $3 \times 5$ 
  - 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.

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