REFRACTORIES – II (SEMESTER - 6)

CS/B.Tech(CT)/SEM-6/CT-601/09

1. ....
Signature of Invigilator

2. ....
Signature of the Officer-in-Charge

Reg. No. | | | | | | | | | | | | | | | |

Roll No. of the Candidate | | | | | | | | | | | | | | | |

CS/B.Tech(CT)/SEM-6/CT-601/09

ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009

REFRACTORIES – II (SEMESTER - 6)

Time : 3 Hours] [Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
   b) For **Groups – B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

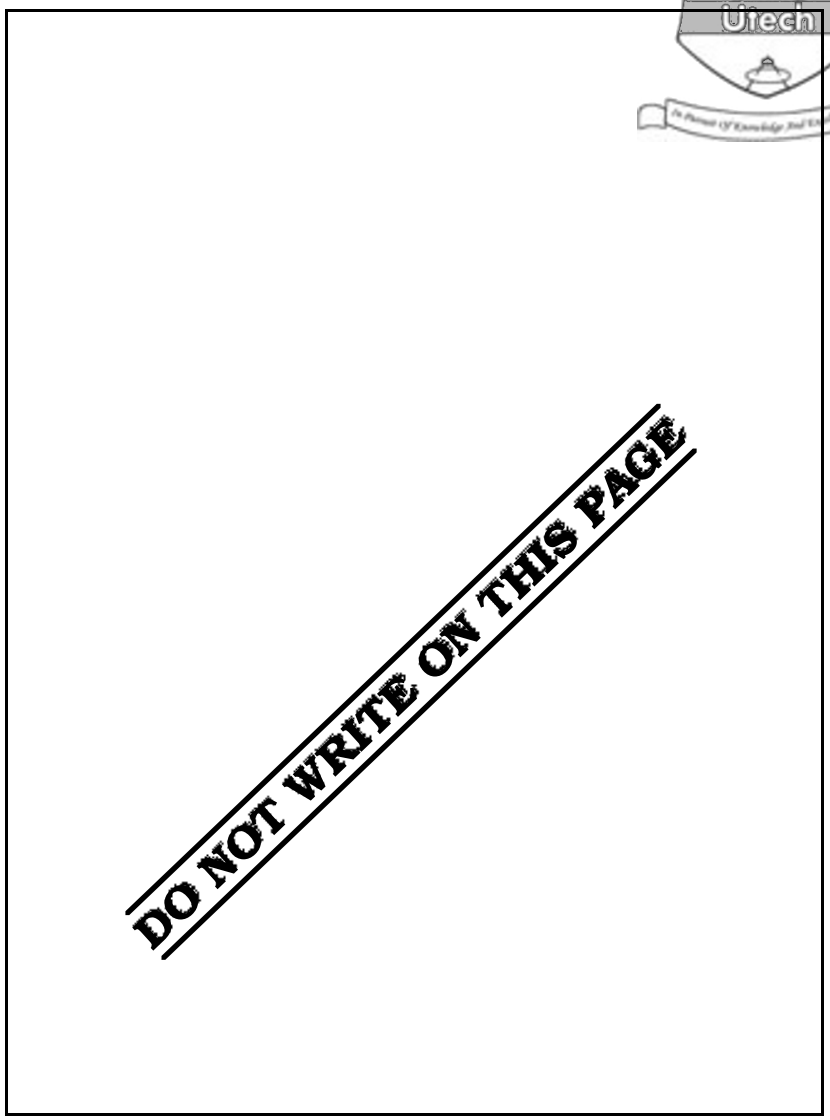
FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

	Group – A										Group – B			Group – C				
Question Number																	***Total Marks***	***Examiner's Signature***
Marks Obtained																		

....
Head-Examiner/Co-Ordinator/Scrutineer

6620 (03/06)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ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009

REFRACTORIES – II

SEMESTERS - 6

Time : 3 Hours] [Full Marks : 70

GROUP – A

(Multiple Choice Type Questions)

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

i) Tempering of pitch bonded MgO-C brick is done at

a) 110°C b) 220°C

c) 350°C d) none of these. ☐

ii) Coked porosity and tempered porosity of Dolo-carbon bricks are related as

a) tempered porosity = coked porosity

b) tempered porosity > coked porosity

c) tempered porosity < coked porosity

d) none of these. ☐

iii) Slag zone of most steel Laddle is made of

a) burnt magnesia brick b) MgO-C bricks

c) Al_2O_3 – MgO-C bricks d) none of these. ☐

iv) Fused magnesia is preferred in MgO-C bricks because it has

a) good spalling resistance b) good corrosion resistance

c) bad corrosion resistance d) none of these. ☐

v) White tabular alumina is preferred to white fused alumina in making + 99% Al_2O_3 refractories because WTA has

a) better spalling resistance than WFA

b) lower spalling resistance than WFA

c) better corrosion resistance than WFA

d) none of these. ☐

vi) Burnt MgO – $MgAl_2O_4$ bricks in cement rotary kiln transition zone contains

a) 80 wt% DBM and 20 wt% spinel

b) 20 wt% DBM and 80 wt% spinel

c) 50 wt% DBM and 50 wt% spinel

d) none of these. ☐

vii) Drying aid used for refractory castables are

a) SSF b) ORF

c) Al-metal powder d) SiC-powder. ☐

viii) In NO cement castables binder is

a) α-Al_2O_3 b) β-Al_2O_3

c) γ-Al_2O_3 d) *i*-Al_2O_3 . ☐

ix) Insulating castable can be used above 1600°C by using aggregate as

a) DBM b) fire bricks grog

c) perlite d) bubble-Al_2O_3 . ☐

x) In L.C.C., cement content lies between

a) 1% – 3% b) 5% – 8%

c) 8% – 10% d) 15% – 20%. ☐

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \infty 5 = 15$

2. Discuss why coked properties of MgO-C bricks are more important than its tempered properties. 5

3. Discuss briefly physicochemical properties of DBM suitable for making MgO-C bricks for working lining of L.D. converter. 5

4. Name different anti-oxidants used in MgO-C bricks. Discuss their role in development of refractory properties of MgO-C bricks. 5

5. What would be the characteristic of HAC used in castable refractories ? What type of heating schedules followed in castable refractories ? 2 + 3

6. What are the salient features of ULCC ? Where are they used ? 3 + 2

7. Generally strength of cement bonded castable refractories decreases with increase of temperature — why ? What are the drawbacks of castable refractories ? 3 + 2

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \infty 15 = 45$

8. What are dolo-carbon and Mag-dolo-carbon bricks ? Name different raw materials used for making such bricks. Discuss with flow-diagram, how Dolo-carbon bricks are produced in the plant. State some of its properties and uses. $\left(1\frac{1}{2} \infty 2\right) + 3 + 5 + 4$

9. What are MgO-C, Al_2O_3 – MgO-C and MgO-Al_2O_3-C bricks ? Name different raw materials and some of their important properties used for making such refractories in the plant. Discuss briefly with process flow diagram how resin-bonded Al_2O_3 – MgO-C bricks are produced in the plant. State some of its important properties.

$\left(1\frac{1}{2} \infty 3\right) + 4\frac{1}{2} + 4 + 2$

10. What is gel bonded castables ? What are the advantages of gel bonded castables over LCC and ULCC ? What are the characteristics of gel banded castables ? What are the application of gel bonded castables ? 2 + 5 + 3 + 5

11. What is the binder used in NCC ? How this binder develops green strength as well as high temp. strength in NCC ? What are the disadvantages of using this type of binder in NCC ? How workability of such castables in maintained ? 3 + 5 + 4 + 3

12. What are ramming refractories ? How is it installed and where is it used ? What are the advantages of ramming mixes ? What are the binder used in ramming mixes ? What would be the bonding characteristics of ramming mixes ? 2 + 3 + 3 + 2 + 5

END