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Invigilator's Signature :	

CS/B.Tech/CT (NEW)/SEM-6/CT-601/2013 2013

CEMENT & CONCRETE TECHNOLOGY

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

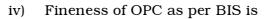
(Multiple Choice Type Questions)

- 1. Choose the correct alternatives for the following : $10 \times 1 = 10$
 - i) Free lime in OPC is detrimental due to
 - a) decrease setting time b) decrease strength
 - c) decrease corrosion d) none of these.
 - ii) The cause of unsoundness in cement is due to
 - a) Na₂O

- b) MgO
- c) $\operatorname{Fe}_{2} \operatorname{O}_{3}$
- d) SiO_2 .
- iii) HAC is extensively used as refractory cement and not for building construction purposes because
 - a) lower cost
- b) higher cost
- c) low strength at r.t.
- d) none of these.

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- a) $3500 \text{ cm}^2/\text{gm}$
- b) 2250 cm²/gm
- c) $3000 \text{ cm}^2/\text{gm}$
- d) none of these.

v) Purity of HAC depends mainly on

- a) CaO content
- b) Al₂O₃ content
- c) Fe₂O₃ content
- d) SiO₂ content.

vi) False set occurs in OPC due to formation of

- a) ettringite phase
- b) syngenite phase
- c) C₃A phase
- d) none of these.

vii) Mane phase of HAC is

a) CA_2

b) C₂AS

c) CA

d) C₂S.

viii) Flash set occurs in OPC due to

- a) C₂S phase
- b) C₃A phase
- c) C₃S phase
- d) C₄ AF phase.

ix) Granulated BFS is used for slag cement because of

- a) crystalline in nature
- b) amorphous in nature
- c) lower setting time
- d) none of these.

x) Wash water from a concrete cannot be used as mixing water in cement due to

- a) low lime and alkali content
- b) high lime and alkali content
- c) high ${
 m SiO}_2$ content
- d) none of these.





(Short Answer Type Questions)

Answer any three of the following.



- 2. What are the processes used for cement manufacturing? What are the advantages and disadvantages of these processes? 3+2
- 3. Write short notes on any *two* of the following: $2 \times 2\frac{1}{2}$
 - a) Oil-well cement
 - b) Coloured cement
 - c) Cement paints
 - d) Portland blast furnace slag cement.
- 4. What do you mean by bleeding of concrete ? Is it always harmful or not ? Explain. 2+3
- 5. What do you mean by flash set and false set of OPC? What are the causes of these types of setting? 2 + 3
- 6. What are silica modulus, iron modulus and chemical modulus? What do you can guess from silica modulus?

3 + 2

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(Long Answer Type Questions)

Answer any three of the following.



- 7. What do you mean by setting and hardening of Portland cement? What changes occur during setting of Portland cement? Discuss with a diagram the setting, hardening and ageing process of OPC.

 3 + 6 + 6
- 8. What do you mean by pozzolana? What are the factors influencing the pozzolanic activity of a pozzolana? Discuss the lime pozzolona reaction and also mention the products formed in the lime pozzolana reaction. 2+3+6+4
- 9. What is concrete and what is its composition? What do you mean by bad concrete and good concrete? What do you mean by workability of concrete and what factors are responsible for workability of concrete? 4 + 2 + 2 + 4 + 3
- 10. What are the mineralogical phases present in the HAC ? Write with a flow-chart for the manufacture of HAC. Discuss the hydration reaction of HAC. 4+6+5
- 11. Define and signify the following:
 - a) Insoluble residue in cement
 - b) Free lime in OPC.

Distinguish between initial set and final set. On what factors does setting time of OPC depend? What do you mean by soundness of cement? How is it experimentally measured?

2 + 2 + 3 + 2 + 2 + 4

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