



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS / B.TECH(CT) / SEM-5 / CT-504 / 2011-12**  
**2011**  
**CEMENT AND CONCRETE**

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) The cause of unsoundness in cement is due to
  - a)  $\text{Na}_2\text{O}$  &  $\text{K}_2\text{O}$
  - b)  $\text{CaO}$  &  $\text{MgO}$
  - c)  $\text{Al}_2\text{O}_3$  &  $\text{Fe}_2\text{O}_3$
  - d) none of these.
- ii) 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.
- iii) False set occurs in OPC due to formation of
  - a) Ettringite phase
  - b)  $\text{C}_3\text{A}$ -phase
  - c) Syngenite phase
  - d) none of these.



- iv) Purity of HAC depends mainly on
  - a)  $\text{Al}_2\text{O}_3$ -content
  - b) CaO-content
  - c)  $\text{Fe}_2\text{O}_3$ -content
  - d) none of these.
- v) Main Phase of HAC is
  - a)  $\text{C}_2\text{S}$
  - b)  $\text{C}_2\text{AS}$
  - c)  $\text{CA}_2$
  - d) CA.
- vi) Fineness of OPC is as per BIS
  - a)  $3500 \text{ cm}^2/\text{gm}$
  - b)  $3000 \text{ cm}^2/\text{gm}$
  - c)  $2250 \text{ cm}^2/\text{gm}$
  - d) none of these
- vii) Flash set occurs in OPC due to
  - a)  $\text{C}_3\text{S}$ -Phase
  - b)  $\text{C}_4\text{AF}$ -Phase
  - c)  $\text{C}_3\text{A}$ -Phase
  - d)  $\text{C}_2\text{S}$ -Phase.
- viii) Wash water from a concrete cannot be used as mixing water in cement due to
  - a) low lime & alkalicontent
  - b) high lime & alkalicontent
  - c) high  $\text{SiO}_2$  content
  - d) none of these.
- ix) Free lime in OPC is detrimental due to
  - a) decrease corrosion
  - b) decrease strength
  - c) decrease setting time
  - d) none of these.
- x) HAC is extensively used as refractory cement and not for building construction purposes because
  - a) lower cost
  - b) higher cost
  - c) quick setting
  - d) low strength at room temperature.



**GROUP – B**

**( Short Answer Type Questions )**

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

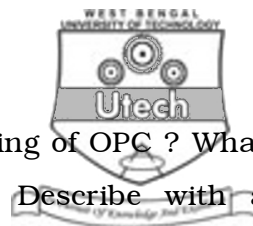
2. What is the composition of Indian Blast Furnace slag ? How BFS is granulated for the production of Blended cement ?
3. What is Pozzolana ? What are the products formed in Lime Pozzolana reaction ?  $1 + 4$
4. Write short notes on any two of the following :  $2 \times 2\frac{1}{2}$ 
  - a) Cement Paints
  - b) Oil well cement
  - c) Coloured cement.
5. What do you mean by bleeding of concrete ? Is it always harmful or not ? Explain.  $2 + 3$
6. What do you mean by Silica modulus and Iron modulus of cement ? What can you guess from the above modulus ?  $3 + 2$

**GROUP – C**

**( Long Answer Type Questions )**

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

7. What are the Kilns used for cement manufacturing ? What are the refractions used in different zones in Rotary Kiln and why ? Describe with a flowsheet diagram for the manufacture of OPC in dry process.  $1 + 4 + 5 + 5$



8. What do you mean by setting and hardening of OPC ? What changes occur during setting of OPC? Describe with a flowsheet for the setting, hardening and ageing process of OPC. 4 + 5 + 6
9. What do you mean by flash set and false set of cement ? What are the causes of these types of setting ? How false set of the cement can be avoided ? Discuss the Alkali-Aggregate reaction in OPC ? 4 + 3 + 3 + 5
10. What are the raw materials used for manufacturing of HAC ? How HAC is classified as per their impurity ? Describe the hydrations process of HAC. Write down the manufacturing process of HAC. 2 + 3 + 5 + 5
11. Define concrete and write its composition. What do you mean by workability ? What factors are responsible for workability of concrete ? How bleeding of concrete is experimentally measured ? 4 + 3 + 5 + 3
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