



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.Tech (CT)/SEM-5/CT-504/2010-11**  
**2010-11**  
**CEMENT & CONCRETE**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

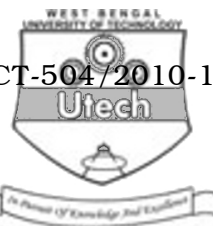
*Candidates are required to give their answers in their own words  
as far as practicable.*

**GROUP – A**  
**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for the following :  $10 \times 1 = 10$
- i) 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) quick setting.
  - ii) Free lime in OPC is detrimental due to
    - a) decrease corrosion
    - b) decrease strength
    - c) decrease setting time
  - iii) The cause of unsoundness in cement is due to
    - a)  $\text{Na}_2\text{O}$                           b)  $\text{MgO}$
    - c)  $\text{Fe}_2\text{O}_3$                         d)  $\text{SiO}_2$ .



- iv) Granulated BFS is used for slag cement because of
- a) crystalline in nature
  - b) amorphous in nature
  - c) lower setting time
- v) Flash set occurs in OPC in due to
- a)  $C_2S$  - phase
  - b)  $C_3A$  - phase
  - c)  $C_3S$  - phase
  - d)  $C_4AF$  - phase .
- vi) Wash water from a concrete cannot be used as mixing water in cement due to
- a) low lime & alkali content
  - b) high lime & alkali content
  - c) high  $SiO_2$  content
  - d) none of these.
- vii) False set occurs in OPC due to formation of
- a) Ettringite phase
  - b) Syngenite phase
  - c)  $C_3A$  - phase
  - d) none of these.
- viii) Purity of HAC depends mainly on
- a)  $Al_2O_3$  content
  - b) CaO-content
  - c)  $Fe_2O_3$  content
  - d)  $SiO_2$  content.
- ix) Main phase of HAC is
- a)  $CA_2$
  - b)  $C_2AS$
  - c) CA
  - d)  $C_2S$ .
- x) Fineness of OPC is
- a)  $3500 \text{ cm}^2/\text{gm}$
  - b)  $2250 \text{ cm}^2/\text{gm}$
  - c)  $3000 \text{ cm}^2/\text{gm}$
  - d) none of these.



**GROUP – B**

**( Short Answer Type Questions )**

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

2. Define Silica modulus, Iron modulus and chemical modulus.  
What can you guess from Silica modulus ?  $3 + 2$
3. What are the processes used for cement manufacturing ?  
What are the advantages and disadvantages of those processes ?  $2 + 3$
4. Write short notes on any *two* of the following :  $2 \times 2\frac{1}{2}$ 
  - a) Rapid hardening cement
  - b) Sulphate resisting cement
  - c) Portland blast furnace slag cement.
5. What do you mean by bleeding of concrete ? Is it always harmful or not ? Explain.  $2 + 3$
6. What are the tests necessary for cement and why ? What are the insoluble materials present in cement ?  $4 + 1$

**GROUP – C**

**( Long Answer Type Questions )**

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

7. What are the importances of particle fineness of cement ?  
Mention different methods for determining particle fineness of cement and compare between these methods. What do you mean by soundness of cement ? How is it experimentally measured ?  $2 + 4 + 3 + 2 + 4$



8. Define concrete and its composition. What do you mean by workability and what factors are responsible for workability of concrete ? How bleeding of concrete is experimentally measured ?  
4 + 3 + 5 + 3
9. Define HAC as per BS-specification. What are the raw materials used for manufacturing of HAC ? Describe with a flow chart the manufacturing of HAC. How HAC is classified as per their impurity content ?  
2 + 3 + 5 + 5
10. What are the kilns used for cement manufacturing and which one is more economical and why ? What are the refractories used in different zones in rotary kiln and why ?  
2 + 1 + 1 + 5 + 6
11. 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
12. What do you mean by hydration of OPC ? What are the factors influencing the kinetics of hydration process ? Discuss with a neat sketch, the hydration of reaction of OPC.  
3 + 6 + 6
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