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**CE215 (R20)**

B.TECH. DEGREE EXAMINATION, MARCH-2023

Semester III [Second Year] (Regular & Supplementary)

# CONCRETE TECHNOLOGY

Time: Three hours | Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:
   (a) Define clinker. CO1
   (b) What is the meaning of digit '53' in 53 grade OPC? CO1
   (c) Define coarse aggregate. CO1
   (d) List the names of any two tests for cement. CO1
   (e) Define curing. CO2
   (f) What is the function of super plasticizer? CO3
   (g) Distinguish retarder and accelerator. CO3
   (h) What is the final setting time of cement? CO1
   (i) Define bulking of fine aggregate. CO1
   (j) Define weigh batching. CO2
   (k) List the names of any two pozzolanic materials. CO3
   (l) Define SCC. CO4
   (m) What is the function of low heat cement? CO1
   (n) Define high strength concrete. CO4

## UNIT – I

2. Explain the process of manufacturing of Portland cement by dry process. CO1

(OR)

3. (a) Discuss in detail about classification of aggregates. (7M) CO1
   (b) Explain the procedure of setting time tests for cement. (7M) CO1

## UNIT – II

4. (a) Explain the slump cone test for determining workability of concrete with neat sketch. (7M) CO2
   (b) Explain about segregation. (7M) CO2

(OR)

5. (a) Discuss about mineral admixtures. (7M) CO3
   (b) Explain about plasticizers. (7M) CO3

## UNIT – III

6. Demonstrate the procedure of compressive strength test and split tensile strength test. CO3

(OR)

7. (a) Explain the effect of height/diameter ratio on compressive strength. (7M) CO3
   (b) Explain about chloride attack and the methods for controlling it. (7M) CO3

## UNIT – IV

8. Design M30 grade concrete mix using IS method for the following data:
   Specific gravity of cement = 3.12
   Specific gravity of fine aggregate = 2.62
   Specific gravity of coarse aggregate = 2.72
   Fineness modulus of fine aggregate = 2.3 (Zone III sand)
   Fineness modulus of coarse aggregate = 6.9
   Condition of exposure = Severe
   Workability in terms of slump = 150 mm
   Assume any necessary data suitably. CO4

(OR)

9. (a) Explain about fibre reinforced concrete. (7M) CO4
   (b) Explain about high performance concrete. (7M) CO4

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**CE215 (R20)**

B.TECH. DEGREE EXAMINATION, JUNE-2023

Semester III [Second Year] (Supplementary)

# CONCRETE TECHNOLOGY

Time: Three hours | Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:
   (a) Define heat of hydration. CO1
   (b) What is the meaning of digit '43' in 43 grade OPC? CO1
   (c) What is the function of quick setting cement? CO1
   (d) Define accelerator. CO3
   (e) Define batching. CO2
   (f) What is the function of plasticizer? CO3
   (g) Define segregation. CO2
   (h) Classify fine aggregate and coarse aggregate. CO1
   (i) What is the initial setting time of cement? CO1
   (j) What is Abram's Law? CO2
   (k) List the names of any two tests for finding workability of concrete. CO2
   (l) What are mineral admixtures? CO3
   (m) What is the formula for calculating target mean strength? CO4
   (n) Define no fines concrete. CO4

## UNIT – I

2. (a) Explain about Bogue's compounds. (7M) CO1
   (b) Discuss the hydration process of cement. (7M) CO1

(OR)

3. (a) Discuss in detail about bulking of fine aggregate. (7M) CO1
   (b) Explain the procedure of fineness test and standard consistency test for cement. (7M) CO1

## UNIT – II

4. (a) Define workability and detail the factors affecting workability of concrete. (7M) CO2
   (b) Explain about compaction factor test. (7M) CO2

(OR)

5. (a) Explain about bleeding. (7M) CO2
   (b) Explain about fly ash and its effect on strength of concrete. (7M) CO3

## UNIT – III

6. Demonstrate the non-destructive testing methods for concrete. CO3

(OR)

7. (a) Explain the effect of water-cement ratio on strength of concrete. (7M) CO3
   (b) List the methods for controlling corrosion in steel. (7M) CO3

## UNIT – IV

8. Explain step by step procedure of concrete mix design by using IS method. CO4

(OR)

9. (a) Explain about Light weight concrete. (7M) CO4
   (b) Explain about High strength concrete. (7M) CO4

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**CE215 (R20)**

B.TECH. DEGREE EXAMINATION, DECEMBER-2023

Semester III [Second Year] (Regular & Supplementary)

# CONCRETE TECHNOLOGY

Time: Three hours | Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:
   (a) What is the influence of tri and di-calcium silicates and tri-calcium aluminate on the properties of cement? CO1
   (b) Define hydration of cement. CO1
   (c) Explain bulking of sand. CO1
   (d) Classify factors affecting workability. CO2
   (e) List the methods of consolidation or compaction of concrete. CO2
   (f) What is the need for curing in concrete? CO2
   (g) List out the NDT tests. CO3
   (h) Explain about dynamic modulus. CO3
   (i) List out the various factors affecting compressive strength? CO3
   (j) Explain the term nominal mix and design mix. CO4
   (k) List the factors to be considered for mix design. CO4
   (l) List the advantages of fibre reinforced concrete. CO4
   (m) Classify the types of artificial lightweight aggregate? CO4
   (n) Define high performance concrete. CO4

## UNIT – I

2. (a) Describe the importance of the quality of water used for concreting. (7M) CO1
   (b) List the various types of cement indicating their use for different applications. (7M) CO1

(OR)

3. (a) What are the important chemical tests conducted on cement to determine its quality. (7M) CO1
   (b) Explain the test involved in aggregates as per IS. (7M) CO1

UNIT – II

4. (a) How does increasing the quality of water influence the properties of fresh concrete? (7M) CO2
   (b) What are the effects of the shape and texture of aggregates on the strength and workability of concrete? (7M) CO2

(OR)

5. Define the term workability. What are the various tests conducted to determine the workability of concrete and explain them. CO2

UNIT – III

6. List and explain the methods used for testing hardened concrete. CO3

(OR)

7. Explain durability of concrete and factors affecting durability of concrete. CO3

UNIT – IV

8. Describe in detail about the procedure for IS method of mix design. CO4

(OR)

9. (a) Analyse aspects of HPC that are related to strength and durability separately. (7M) CO4
   (b) Illustrate about high strength concrete and fibre reinforced concrete (7M) CO4

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**CE215 (R20)**

B.TECH. DEGREE EXAMINATION, APRIL-2024

Semester III [Second Year] (Supplementary)

# CONCRETE TECHNOLOGY

Time: Three hours | Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:
   (a) What are the Bogue's compounds? CO1
   (b) Define air entraining cement. CO1
   (c) Define fineness of cement. CO1
   (d) What is the significance of fineness modulus of fine aggregate? CO2
   (e) What are the permissible limits of solids in water for construction as per Indian Standards? CO2
   (f) Define workability of concrete. CO2
   (g) What are the functions of retardants in concrete? CO3
   (h) Define durability of concrete. CO3
   (i) Define Poisson's ratio of concrete. CO3
   (j) Explain the permissible crack widths in concrete as per Indian Standard. CO4
   (k) Define self-compacting concrete. CO4
   (l) What is the significance of standard deviation in mix design of concrete? CO4
   (m) Define soundness of cement. CO4
   (n) What is the significance of specific gravity of cement? CO4

## UNIT – I

2. (a) Explain the dry process of manufacturing of cement. (7M) CO1
   (b) Explain about Portland pozzolana cement. (7M) CO1

(OR)

3. (a) Explain the test procedure of standard consistency of cement. (7M) CO1
   (b) Explain the influence of grading of aggregate on strength of concrete. (7M) CO1

UNIT – II

4. (a) List out the factors affecting the workability and explain any two of them. (7M) CO2
   (b) Explain compaction of concrete and any two methods. (7M) CO2

(OR)

5. (a) Explain about super plasticizers. (7M) CO2
   (b) What are the mineral admixtures used in the concrete and how they influence the durability of concrete. (7M) CO2

UNIT – III

6. (a) Explain the effect of water to cement ratio on strength of concrete. (7M) CO3
   (b) Define non-destructive test on concrete and explain any two them. (7M) CO3

(OR)

7. (a) Analyse chloride attack on concrete. (7M) CO3
   (b) List out the cracks in hardened concrete and explain any two of them. (7M) CO3

UNIT – IV

8. (a) Explain the design of light-weight concrete mix. (7M) CO4
   (b) Analyse high performance concrete. (7M) CO4



(OR)

9. (a) Explain the steps involved in design mix as per IS. (7M) CO4
   (b) Explain the concept of design mix. (7M) CO4

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**CE215 (R20)**

B.TECH. DEGREE EXAMINATION, DECEMBER-2024

Semester III [Second Year] (Regular & Supplementary)

# CONCRETE TECHNOLOGY

Time: Three hours | Maximum Marks: 70

Answer Question No.1 compulsorily. (14 x 1 = 14)
Answer One Question from each unit. (4 x 14 = 56)

1. Answer the following:

| | | |
|---|---|---|
| (a) | Identify methods of proportioning of concrete mixes. | CO1 |
| (b) | List the types of cement. | CO1 |
| (c) | What is the function of gypsum in the manufacture of cement? | CO1 |
| (d) | Write a short note on mixing concrete. | CO2 |
| (e) | Classify the methods for transportation of concrete. | CO2 |
| (f) | Write the different tests for workability of concrete. | CO2 |
| (g) | Point out the factors influencing cracks in concrete. | CO3 |
| (h) | What is the relation between cube strength and cylinder strength of concrete? | CO3 |
| (i) | What are the various factors which affect the measurement of pulse velocity? | CO3 |
| (j) | What are various methods of proportioning? | CO4 |
| (k) | Classify various factors affecting proportioning of concrete mixes. | CO4 |
| (l) | List out types of natural lightweight aggregates. | CO4 |
| (m) | What are the different types of fibres used in concrete? | CO4 |
| (n) | State the different applications of high density concrete. | CO4 |

UNIT – I

2. (a) Discuss in detail various stages of manufacturing of cement concrete. (7M) CO1
   (b) List the various tests conducted on coarse aggregate indicating the property being tested. (7M) CO1

(OR)

3. (a) Explain in detail the different tests employed for cement to ascertain its quality as per IS specification. (7M) CO1
   (b) What is the soundness of cement and how is it tested? (7M) CO1

UNIT – II

4. (a) What are the various factors which affect the workability of concrete? Explain. (7M) CO2
   (b) Explain the differences between a tilting drum mixer, a non-tilting drum mixer, a pan mixer and a dual drum mixer. (7M) CO2

(OR)

5. Discuss the following tests for concrete: CO2
   (i) Flow test
   (ii) slump test

UNIT – III

6. (a) What are the various factors which affect the measurement of pulse velocity? (7M) CO3
   (b) Discuss about the various ND methods of testing concrete? Explain in detail about the ultrasonic pulse velocity test. (7M) CO3

(OR)



7. (a) Describe the method used to determine the flexural strength of concrete. (7M) CO3
   (b) How do you determine the tensile strength of concrete? Explain. (7M) CO3

UNIT – IV

8. (a) What are the various ways of producing lightweight concrete? (7M) CO4
   (b) Write short note on self compacting concrete (7M) CO4

(OR)

9. (a) Differentiate between nominal mix and design mix. (7M) CO4
   (b) Write about parameters to be considered while designing a concrete. (7M) CO4

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