



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Fourth Semester, B.E. - Civil Engineering

Semester End Examination; June - 2017

Concrete Technology

Time: 3 hrs

Max. Marks: 100

Note: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.

ii) Use of IS 10262-2009 permitted.

iii) Any missing data may be suitably assumed.

UNIT - I

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| 1a. Explain with flow chart the cement manufactured by wet process. | 8 |
| b. Name the four Bouge's compounds in cement. | 2 |
| c. Explain any two tests on cement in detail | 10 |
| 2 a. Explain the importance of size and texture of Coarse aggregate. | 10 |
| b. Explain the structure of hydrated cement paste | 8 |
| c. Define the terms, flakiness index and elongatron index. | 2 |

UNIT - II

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|---|----|
| 3 a. List and explain the factors that affect the workability of concrete. | 10 |
| b. What is an admixture? What is the effect of air entrainment on the properties of concrete? | 10 |
| 4 a. Explain briefly the segregation and bleeding. | 8 |
| b. Write short note on : | |
| i) Under water concreting | |
| ii) Direct acting concrete pump | 12 |
| iii) Compaction factor test. | |

UNIT - III

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|---|----|
| 5 a. Explain the influence of water / cement ratio and gel/ space ratio on the strength of the concrete. | 8 |
| b. Calculate the gel/space and theoretical strength of a sample of concrete made with 500 gm. Of cement with 0.5 w/c ratio on full hydration @ 60% hydration. | 4 |
| c. Write a short notes on: | |
| i) Accelerated curing test | |
| ii) Effect of maximum size of aggregate on strength. | 8 |
| 6 a. List and explain the factors affecting creep. | 8 |
| b. Define creep. Explain the measurement of creep. | 10 |
| c. List the types of shrinkage. | 2 |

UNIT - IV

7. Design a concrete mix by IS method for M30 grade concrete as per IS 10262-2009
- i) Grade : M30
 - ii) Cement : OPC-43grade
 - iii) Maximum Nominal size of aggregate : 20 mm
 - iv) Minimum cement content : 320 kg/m³
 - v) Max. w/c ratio : 0.45
 - vi) Workability : 100 mm slump
 - vii) Exposure Condition : Severe (Reinforced concrete)
 - viii) Method of concrete placing : pumping 20
 - ix) Degree of supervision : Good
 - x) Type of aggregate : crushed Angular
 - xi) Max. cement content : 450 kg/m³
 - xii) Chemical admixture : Super plasticizer
 - xiii) Specific gravity of cement : 3.15
 - xiv) Specific gravity of C.A. : 2.74
 - xv) Specific gravity of F.A. : 2.74
 - xvi) Sand – Zone I
- Assume any other data.
- 8 a. Define durability. Explain its significance. 5
- b. Explain the permeability of concrete. 5
- c. List and explain the methods of controlling sulphate attack. 10

UNIT - V

- 9 a. Write short notes on:
- i) Making of high strengths concrete [methods] 12
 - ii) Aggregate for high-performance concrete.
- b. Explain the materials of SCC. 8
10. Write short notes on :
- i) Roller compacted concrete
 - ii) Porous concrete 20
 - iii) Bacterial concrete
 - iv) Translucent concrete.

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