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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; May/June - 2019 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) Missing data, if any, may be suitably assumed.

UNIT - I

- 1 a. Explain with flowchart, the manufacturing process of ordinary Portland cement by wet process. 10
 b. What are Bogue's compounds? With the help of a graph, explain their role in the strength development of cement. 10
- 2 a. Explain the classification of aggregate based on size, shape and texture. What is the importance of grading of aggregates? 8
 b. Explain the phenomenon of bulking of sand. 6
 c. Explain Impact and Abrasion test on coarse aggregate. 6

UNIT - II

- 3 a. Define Workability. Explain the factors affecting Workability of concrete. 10
 b. Mention the different tests conducted to access workability and explain slump test. 10
- 4 a. Explain briefly the segregation and bleeding of concrete. 8
 b. Write a note on curing of concrete. 6
 c. What is an Admixture? Explain plasticizers and fly ash. 6

UNIT - III

- 5 a. Explain Gel/Space ratio and maturity concept of concrete. 10
 b. Write a short notes on : 10
 i) Bond strength of concrete ii) Effect of maximum size of aggregate on strength
- 6 a. Explain plastic shrinkage and drying shrinkage. 10
 b. Define creep. Explain the factors affecting creep of concrete. 10

UNIT - IV

7. Design a concrete mix by IS method for M₃₀ grade concrete as per IS 10262-2009; 20
 i) Maximum size of Aggregate = 20 mm
 ii) Exposure condition = Severe (Reinforced concrete)
 iii) Maximum Water cement ratio = 0.45
 iv) Minimum cement content = 320 kg/m³
 v) Workability = 100 mm slump
 vi) Method of concreting = Pumping
 vii) Chemical admixture = Super plasticizer
 Specific gravity of cement, super plasticizer, coarse aggregate and fine aggregate are 3.15, 1.145, 2.68 and 2.65. Fine aggregate conforming zone I. Assume the suitable data required.

- 8 a. Write a note on permeability of concrete. 5
- b. Write a note on sulphate and chloride attack. 10
- c. Write a note on construction joints. 5

UNIT - V

- 9 a. Define self compacting concrete. Explain the properties, advantages and application. 12
- b. Write a note on High Performance concrete. 8
- 10. Write short notes on :
 - i) Translucent concrete
 - ii) Fibre-Reinforced concrete 20
 - iii) Roller compacted concrete
 - iv) Geo-Polymer concrete

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