

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E.

Branch: Civil Engineering

Course Code: 20CV5PEACT

Course: Advanced Concrete Technology

Semester: V

Duration: 3 hrs.

Max Marks: 100

Date: 03.03.2023

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.
3. Use of IS10262-2019 is permitted

UNIT - I

- 1 a) Discuss briefly the different sustainable materials used in concrete. **08**
- b) Explain the ways in utilizing Construction and demolition waste as a useful material. **06**
- c) Outline the advantages of replacement of fly ash and GGBS with cement. **06**

UNIT - II

- 2 a) Enumerate the limitations of Empirical Test methods. **10**
- b) Explain the Rheology of concrete and discuss the constitute equations or Rheological models. **10**

OR

- 3 a) Discuss the need for self-compacting concrete in the construction industry and the requirements to produce self-compacting concrete. **08**
- b) Design a SCC mix as proposed by Okamura for the following data. **12**
 Air content - 2%,
 Dry rodded density of CA-1.50,
 Water / powder ratio-0.9
 $SG_{\text{cement}}=3.15$
 $SG_{\text{Flyash}}=2.10$
 $SG_{\text{FA}}=2.65$
 $SG_{\text{CA}}=2.68$
 $SG_{\text{SP}}=1.10$
 (SG- Specific Gravity, FA-Fine Aggregates, CA-Coarse Aggregates)
 Assume any other data if required, suitably.

UNIT - III

- 4 a) Relate the mechanical properties of FRC (Fiber Reinforced Concrete) with Normal concrete? **10**

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

- b) Discuss the Importance of steel fibers in fiber reinforced concrete. **05**
- c) Briefly describe SIFCON. **05**

UNIT - IV

- 5 a) Differentiate between High strength concrete and High performance concrete. **08**
- b) Discuss the different types high performance concrete in the construction industry and the role of mineral admixtures in the same. **12**

OR

- 6 a) List the different types of No fines concrete. **04**
- b) Explicate the different ways of making light weight concrete. **08**
- c) Discuss the prepacked method of making High density concrete. **08**

UNIT - V

- 7 a) Compare geopolymer concrete with Conventional Ordinary Portland cement concrete in materials, production and strength gain. **08**
- b) Design geopolymer concrete mix by assuming Density of geopolymer concrete is 2400kg/m^3 . **12**
- The molarity of NaOH is - 10
The ratio of NaOH: Na_2SiO_3 - 2.0
Total water content – 150 l/m^3
Fly ash - 12%
GGBS - 8%
Coarse Aggregate - 55%
Fine aggregate - 45%
