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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_{cement} -3.15
 SG_{Flyash} -2.10
 SG_{FA} -2.65
 SG_{CA} -2.68
 SG_{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
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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: Na₂SiO₃ - 2.0

Total water content – 150 l/m³

Fly ash - 12%

GGBS - 8%

Coarse Aggregate - 55%

Fine aggregate - 45%
