Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

VI SEMESTER B.TECH (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS, JUNE 2022

SUBJECT: **ADVANCES IN CONCRETE TECHNOLOGY [CIE 4051)**

REVISED CREDIT SYSTEM

(_ / 06 / 2022)

Time: 3 Hours Max. Marks: **50**

Instructions to Candidates:

- Answer ALL the questions
- Missing data may be suitably assumed

Q.No		Marks	CO
1A.	Discuss thermal shrinkage and drying shrinkage considering the following parameters: i) the process, cause and examples of such type of shrinkage in concrete ii) Remedies to minimize the shrinkage	4	1
1B.	With the help of a graph and neat sketch, discuss the stress-strain behavior of concrete	4	1
1C.	With the help of a neat sketch, discuss the characteristics of the interfacial transition zone.	2	1
2A.	Discuss i) Slump loss ii) Segregation iii) Bleeding iv) Laitance. Explain the reasons for such undesirable phenomenon	4	2
2B.	Discuss the usefulness of slump test. Discuss the scenarios where slump test is not applicable	4	2
2C.	Use of larger size aggregates leads to higher strength, Justify	2	2,3
3A.	Discuss the properties of Bouque's compounds	4	3
3B.	The design mix for a M25 grade concrete has the following specification (by mass): Water : Cement : Fine aggregate : Coarse aggregate 0.42 : 1 : 0.96 : 2.95 It was observed at the site that coarse aggregate and fine aggregate have free surface moisture of 1 % and 2% respectively. Workout the revised proportion by mass to account for a moisture requirement. Given: Specific gravity of cement: 3.15 Specific gravity of fine aggregate: 2.60 Specific gravity of coarse aggregate: 2.65	4	3
3C.	Discuss the need for advances in concrete technology to meet high performance requirements of the construction industry.	2	4

4A.	Distinguish between i) Reinforced cement concrete and Fiber-reinforced concrete ii) High workability concrete and Self-consolidating concrete	4	4
4B.	Discuss the motive for developing the light weight aggregate concrete.	4	4
4C.	Distinguish between Soft intrusion and hard intrusion fibers. List the types of test that can be performed 'based on distress' to the structures with suitable illustration for any one.	2	4,5
5A.	Explain briefly, with a neat sketch, Schmidt's Rebound Hammer and its test method. List and explain any one test based on purpose of testing the concrete.	4	5
5B.	Discuss the protective measures for reducing sulfate attack in concrete	4	5
5C.	With the help of a neat sketch explain the pull-out test on concrete	2	5