MANIPAL INSTITUTE OF TECHNOLOGY

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MANIPAL INSTITUTE OF TECHNOLOGY

FOURTH SEMESTER B.TECH (CIVIL ENGINEERING)

END SEMESTER EXAMINATION, MAY 2023

BUILDING MATERIAL TECHNOLOGY (CIE 2252)

(ZZ – 05 - 2023)

TIME: 3 HRS. **MAX. MARKS: 50**

Note: 1. Answer all questions.
2. Any missing data may be suitably assumed.
3. Use of IS 456 and IS 10262 codes is permitted.

Q. NO	QUESTION	MARKS	CO	BL
1A	Explain the composition of good brick earth.	5	5	2
1B	Identify the slump ranges for the following types of concrete? (a) stiff concrete (b) poorly mobile (c) mobile	3	3	3
1C	What is meant by toughness of the aggregate and how is it different from compressive strength?	2	1	2
2A	Illustrate the difference between the following (1 x 5) a) segregation and bleeding b) shrinkage and creep c) rich concrete and lean concrete d) compaction and consolidation e) plasticity and consistency	5	3	2
2B	Summarize the characteristics of second-class bricks.	3	5	2
2C	Interpret the factors influencing the modulus of elasticity of concrete.	2	5	2
3A	Design a M25 concrete for the following data: cement with 53 grade having specific gravity 2.9, Zone-III, Slump of 100 mm, for mild exposure condition, course aggregate size of 10mm having specific gravity 2.76 and natural sand as fine aggregate having specific gravity 2.68. consider target mean strength as 40.72 N/mm^2.	5	5	6

3B	Below are the observations of Los Angeles Abrasion test on aggregate. Assess the Los Angeles Abrasion value and write quality control report as per IRC specifications below: Sl.No. | Type of pavement layer | Max. permissible abrasion value in % 1 | Water bound macadam with sub base course | 60 2 | WBM base course with bituminous surfacing | 50 3 | Bituminous bound macadam | 50 4 | WBM surface course | 40 5 | Bituminous penetration macadam | 40 6 | Bituminous surface dressing cement concrete surfaces | 35 7 | courses | 30 Bituminous concrete surfaces courses	**3**	**3**	**5**
3C	Explain Flemish bond with a neat sketch.	**2**	**5**	**2**
4A	Explain any four types of cement in detail.	**5**	**3**	**2**
4B	Explain briefly mosaic flooring.	**3**	**5**	**2**
4C	Identify the significance of adding the following mineral admixtures into self-compacting concrete. a) Ground granulated blast furnace slag b) Fly ash	**2**	**5**	**3**
5A	Explain the procedure of laying of stone slabs and summarize its merits and de-merits.	**5**	**5**	**2**
5B	Identify the factors promoting alkali aggregate reaction with suitable solution to control it.	**3**	**1**	**3**
5C	Outline the important properties of geopolymer concrete.	**2**	**5**	**2**