

Reg. No.

**MANIPAL INSTITUTE OF TECHNOLOGY****MANIPAL***(A constituent unit of MAHE, Manipal)***II SEMESTER M.TECH. (CIVIL) END SEMESTER EXAMINATIONS****MAY 2023****SUBJECT: Non-destructive Testing of Materials [CIE 5053]**

Date of Exam: /0 /2023

Time of exam:

Max. Marks: 50

Instructions to Candidates:

- ❖ Answer **ALL** the questions.
- ❖ Missing data may be suitably assumed.

Q. No	Questions	Marks	CO	BL
1A.	What does a Liquid Penetrant Inspection (LPI) kit contain? Explain.	2	2	2
1B.	Explain the procedure of inspection of surface defects in ferro magnetic material using dry Magnetic Particle Inspection (MPI).	3	4	2
1C.	Explain the kaiser effect and felicity ratio with an illustration.	5	1	2
2A.	Compare Acoustic Emission (AE) and Ultrasound inspection technique.	2	1	2
2B.	What is the fill factor, lift off and skin effect w.r.t eddy current? Explain.	3	1	2
2C.	<p>A concrete beam is subjected to loading cycles and AE were registered as indicated in the diagram below. Determine the concrete beam integrity (CBI) ratio and explain the deterioration process of beam with the help of CBI.</p>	5	5	5



3A.	Describe standard depth of penetration of eddy current.	2	3	2
3B.	Explain the importance of reference standards in used in Non-destructive Testing.	3	3	2
3C.	With a neat sketch describe the application of distance amplitude reference block used in Ultrasound inspection.	5	3	2
4A.	Define: leakage, leak rate, minimum detectable leak and minimum detectable leak rate.	2	1	1
4B.	What are the objectives of leak testing? Explain with suitable example.	3	1	2
4C.	Using the diagram below, describe the conductivity of materials when determined by Eddy current inspection.	5	5	2
5A.	Explain the effect of surface finish and defect condition of test object, on the penetration of liquid penetrant.	2	1	2
5B.	Mention the applications of Ultrasound Inspection method of non-destructing of concrete structure.	3	1	2
5C.	Describe the working principle of computed tomography with a neat sketch.	5	1	2