

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, NOVEMBER - 2023**

MATERIAL SCIENCE AND METROLOGY

[Maximum marks: 75]

[Time: 3 Hours]

PART A

I. Answer all the following questions in one word or one sentence. Each question carries 1 mark

(9 x 1 = 9 Marks)

		Module outcome	Cognitive level
1	Heat treatment process used to soften the metals is.....	M2.03	R
2	Brasses are the primary alloys of copper and.....	M2.05	R
3	The simplest repeating unit in a crystal is called a.....	M1.01	R
4	The main constituents of stainless steel are iron and.....	M1.03	R
5	The science of measurement is	M3.01	R
6	Random errors can be assessed.....	M3.03	R
7	The difference between the lower and higher values that an instrument is able to measure is called.....	M3.03	R
8	Name any one type of limit gauges	M4.01	R
9	Mention any one instrument for angular measurements.	M4.04	R

PART B

II. Answer any eight questions from the following. Each question carries 3 marks.

(8 x 3 = 24 Marks)

		Module outcome	Cognitive level
1	Draw BCC crystal structure	M1.01	R
2	State the importance of TTT diagram	M1.02	R
3	Mention any three uses of wrought iron	M1.03	R
4	Give any three purpose of alloying steels	M1.04	R
5	State any three objectives of case hardening	M2.03	R
6	Write short note on significance of metrology	M3.02	R
7	Compare the terms precision and accuracy.	M3.03	U

8	State the dynamic characteristics of a measurement system.	M3.01	R
9	List any three comparators.	M4.01	R
10	Identify any three linear measurement instruments.	M4.03	A

PART C

Answer all questions. Each question carries seven marks

(6 x 7 = 42 Marks)

		Module outcome	Cognitive level
III	Differentiate between systematic and random errors. OR	M3.03	U
IV	Illustrate with a neat sketch, determination of force using a load cell.	M3.04	A
V	Explain plug gauge with neat sketch. OR	M4.01	U
VI	Explain co-ordinate measuring machine (CMM) with neat sketch.	M4.02	U
VII	Discuss the procedure for radiographic testing with figure. OR	M2.02	U
VIII	Write the composition, properties and uses of duralumin.	M2.05	U
IX	Explain Rockwell Hardness Testing with sketch. OR	M2.02	U
X	Compare brittle fracture with ductile fracture.	M2.01	U
XI	List effects of any three alloying elements on steel. OR	M1.04	U
XII	Draw Iron-Carbon binary diagram.	M1.02	U
XIII	Write the working of an autocollimator with neat sketch. OR	M4.04	A
XIV	Illustrate the working of vernier depth gauge with figure.	M4.04	A
