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(Revision-2021)

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, NOVEMBER - 2025

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	Define space lattice.	M1.01	R
2	What is meant by eutectic steel?	M1.02	U
3	Name any two alloys of Aluminium.	M2.05	R
4	Name any two non-destructive methods of testing.	M2.02	R
5	What is meant by measurement?	M3.01	U
6	Define range.	M3.03	R
7	Differentiate cast iron and carbon steel.	M1.03	U
8	Define surface texture.	M4.02	R
9	Spirit level is used for measuring…..	M4.04	U

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	Explain HCP crystal structure with example.	M1.01	U
2	What is a phase diagram?	M1.02	R
3	Name any three case-hardening processes.	M2.03	R
4	What is meant by creep?	M2.01	U
5	Name any three destructive testing process and give its application.	M2.02	R
6	Explain direct and indirect measurement.	M3.02	U
7	What is the working principle of strain gauge?	M3.04	U
8	How are errors in measurement classified?	M3.03	R
9	List the various tests in machine tool metrology.	M4.05	R
10	Name six gauges used for inspection.	M4.01	R

PART C

Answer all questions from the following. Each question carries 7 marks

(6 x 7 = 42 Marks)

		Module outcome	Cognitive level
III	Explain the effect of various alloying elements in steel.	M1.04	U
	OR		
IV	Describe the composition and applications of any three types of alloy steels.	M1.03	U
V	Differentiate between Annealing and Normalizing.	M2.04	U
	OR		
VI	Classify engineering materials with examples.	M1.01	U
VII	Explain brittle fracture.	M2.01	U
	OR		
VIII	Explain hardening and its application.	M2.03	U
IX	Compare systematic errors and random errors.	M3.02	U
	OR		
X	Describe a generalized measuring system.	M3.03	U
XI	Explain the principle and working of a spring balance.	M3.04	A
	OR		
XII	Explain working of a Coordinate Measuring Machine.	M4.03	U
XIII	Explain any three types of comparators used in measurement.	M4.01	U
	OR		
XIV	Explain principle and working of Autocollimator.	M4.04	A

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