

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE – NOVEMBER - 2022**

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.

(9x1=9 marks)

		Module Outcome	Cognitive level
1	An infinite periodic array of points in a space is called.....	M 1.01	R
2	Name the two fracture modes.	M 2.01	R
3	Process to make the external surface of steel hard and inner core soft is called.....	M2.03	R
4are mixtures of two or more metals formed together with other elements to create new metals with improved properties.	M1.04	R
5is the degree to which the measured value of the quality characteristic agrees with the true value.	M3.03	R
6	The ratio of the change of instrument indication to the change of quantity being measured is termed as.....	M3.03	R
7	Name the limit gauge used for checking internal dimension.	M4.01	R
8	The smallest value that can be measured by a measuring instrument is called.....	M4.04	R
9	Load cells are commonly used to measure.....in an industrial environment.	M3.04	R

PART - B

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

(8x3=24marks)

		Module Outcome	Cognitive level
1	Name three types of steels based on the carbon content.	M 1.03	R
2	Give uses of cast iron.	M 1.03	R
3	State any three application of stainless steel.	M1.04	R
4	Draw FCC crystal structure.	M1.01	R
5	Write notes on the static characteristics of a measurement system.	M3.01	U
6	Define threshold associated with measuring instrument.	M3.03	R
7	Briefly explain direct and indirect method measurements.	M3.03	U
8	State the characteristics of comparator.	M4.01	R
9	Name any three angular measuring instrument used in metrology.	M4.04	R
10	List any three types of non-destructive testing (NDT) techniques.	M2.02	R

PART - C

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

(6x7=42marks)

		Module Outcome	Cognitive level
III	Discuss about the classification of engineering materials.	M1.01	U
	OR		
IV	Explain iron carbon equilibrium diagram.	M1.02	U
V	State the advantages and applications of ultrasonic testing.	M2.02	U
	OR		
VI	Write notes on types of bronze.	M2.05	U
VII	Briefly explain Brinell hardness testing with diagram.	M2.02	U
	OR		
VIII	Compare martempering and austempering.	M2.03	U
IX	Illustrate the working of spring balance with neat sketch.	M3.04	A
	OR		
X	What are Errors in Measurement? Explain different types of errors in measurement.	M3.03	U
XI	With the help of a diagram illustrate the procedure for straightness testing technique.	M3.03	A
	OR		
XII	Describe the principle and working of sine bar.	M4.04	U
XIII	With neat sketch, illustrate the working of vernier depth gauge.	M4.03	A
	OR		
XIV	Illustrate the working of electrical comparator.	M4.01	A
