

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2024

Subject Code:3172118

Date:30-11-2024

Subject Name: Introduction to standards and specifications in Metallurgy

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) What is AISI, EN and BIS? explain full designation of AISI 4140 Steel.	03
	(b) Write equivalent standard of the following materials in EN/SAE/AISI/BIS 1. Ball bearing steel 2. Spring Steel	04
	(c) Explain ASTM Standard & Test procedure for the Pitting corrosion.	07
Q.2	(a) Define Code, Standard and Specification.	03
	(b) List out AISI 1XXX to 9XXX series steel .	04
	(c) Explain and discuss ISO 9000 & 14000 standards and Total quality management.	07
	OR	
	(c) Explain stages of fatigue failure. Discuss Fatigue failure occur in metallic materials with suitable example.	07
Q.3	(a) Define Strength. Explain test specimen preparation with diagram.	03
	(b) List different Scale with Load, Indentator and Application as per ASTM E18.	04
	(c) With neat diagram, write detail of indentation ASTM E92-82.	07
	OR	
Q.3	(a) Discuss H ₂ Embrittlement testing procedure as per Standard. Explain in brief.	03
	(b) Explain in brief ASTM E 407 standard.	04
	(c) Write and Explain procedure of grain size measurement as per E112.	07
Q.4	(a) What information is available from the following ASME BPV Code? ASME Section II A, II B and II C.	03
	(b) Which procedure is use for inclusion rating in steel? Explain inclusion rating ASTM procedure	04
	(c) List out Essential Variables, Non Essentials variables and supplementary essential variables with examples for the SMAW Process.	07
	OR	
Q.4	(a) List out Specimen preparation steps for optical microscopy.	03
	(b) Define the following (As per ASME BPV SEC-IX) in brief. 1.WPS 2.PQR 3.WPQ P No G No, F No and A No	04
	(c) For Micro hardness testing Which ASTM standard is use? Explain it with ISO standard .	07

- Q.5** (a) What is the purpose of Welder Qualification? Welder qualification shall be done according to which ASME Code ? **03**
- (b) What is ASME SEC II Part A, Part B and Part C? Name the ASME code for the rules for the construction of pressure vessels and Boilers? **04**
- (c) Discuss ASTM procedure for testing of component by Izod test. **07**
- OR**
- Q.5** (a) Differentiate between Essential variables, Supplementary essential variables and Non essential variables with examples of each. **03**
- (b) Explain the designation of the covered electrode, electrode rod, filler Metal of the following as per AWS Specifications wrt ASME BPV SEC II Part C **04**
1. ER 70S-2 2. ER Ni Cr Fe-5
- (c) For SCC Which ASTM standard is use? Expalin it. **07**
