Seat No.:	Enrolment No.
-----------	---------------

Subject Code: 162105

GUJARAT TECHNOLOGICAL UNIVERSITY

Date: 04-12-2013

BE - SEMESTER-VI • EXAMINATION - WINTER 2013

Subj	ect l	Name: Electrometallurgy and Corrosion	
Time	e: 02	:30 pm to 05:00 pm Total Marks: 70	
Instru			
		Attempt all questions.	
		Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
	3.	rigules to the light indicate full marks.	
Q.1	(a)	Write Piling-Bedworth ratio. Discuss its importance and applications in	07
C	()	corrosion study.	
	(b)	Compare Tafel extrapolation method with linear polarization method for the	07
	, ,	determination of corrosion rate. State their applications.	
Q.2 (a)		Enlist factors affecting corrosion. Discuss the effect of anodic area, pH and	07
		velocity on corrosion rate.	
	(b)	With proper examples explain how material selection is helpful to combat	07
		corrosion in automobile industries.	
		OR	
	(b)		07
		sketch.	
Q.3	(a)	Discuss the Pourbaix diagram for Fe-H ₂ O system and show that how it is	07
	(1.)	useful in corrosion study.	0 =
	(b)	What is galvanic series? Discuss it's applicability and limitations in	07
		corrosion studies. Compare it with e.m.f. series. OR	
Q.3	(a)	Discuss about concentration polarization. Differentiate between	07
Q.J	(a)	concentration polarization and activation polarization.	07
	(b)	Derive Nernst equation for electrode potential. Mention applications and	07
	(2)	limitations of Nernst's equation in corrosion study.	0,
Q.4	(a)	Explain mechanism of inter granular corrosion. Describe methods to prevent	07
Q. - (a)		it in stainless steel.	07
	(b)	Discuss causes and mechanism of stress corrosion cracking. Suggest and	07
	(~)	explain possible remedial measures against it.	
		OR	
Q.4	(a)	Discuss causes, mechanism and way of prevention of galvanic corrosion.	07
Q.4	(b)	What do you understand by pitting corrosion? Explain factors which increase	07
		pitting. Describe methods to prevent it.	
Q.5	(a)		07
		sacrificial anode cathodic protection method.	
	(b)	Define Galvanizing. Explain Galvanizing Process. Give advantage and	07
		application of Galvanizing.	
0.5		OR	^=
Q.5	(a)	What are inhibitors? With the help of proper examples, differentiate between	07
	(L)	cathodic and anodic inhibitors.	Ω4
	(b)	Calculate the amount of Zn required per square meter to protect underground pipeline in last 4 years for Cathodic protection, if the current density	04
		required is 25 mA/square meter. (One mole of Zn has a mass of 0.06537 kg.)	
	(c)		03
	(0)	1 1101 to conting, metal buriace needs cicuming. Comment on it.	UJ
