Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – III • EXAMINATION – WINTER • 2014

Subject code: 730902 **Date: 27-11-2014**

Subject Name: Fracture Mechanics

Time: 02:30 pm - 05:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	How the fracture mechanics approach is different than convention design approach? List the application of fracture mechanics.	**07**
	(b)	Discuss at least two case studies of fracture mechanics in detail.	**07**
Q.2	**(a)**	Differentiate clearly between LEFM and EPFM.	**07**
	(b)	Explain the fracture mechanisms - Brittle fracture, Ductile fracture.	**07**
		OR	
	(b)	Discuss the contributions of Griffith and Irwin in fracture mechanics area.	**07**
Q.3	**(a)**	Explain the Stress corrosion cracking (SCC).	**07**
	(b)	Clarify the fatigue crack growth model and explain any one of them.	**07**
		OR	
Q.3	**(a)**	Define stress intensity factor and explain its significance. How will you estimate SIF?	**07**
	(b)	Explain the fracture toughness and itôs testing - ASTM standard fracture test.	**07**
Q.4	**(a)**	Explain the dynamic fracture and challenges in dynamic fracture.	**07**
	(b)	Explain the high cycle fatigue and low cycle fatigue.	**07**
		OR	
Q.4	**(a)**	Write a note on: Fracture of composite materials.	**07**
	(b)	Explain the fatigue crack initiation and propagation with neat sketches.	**07**
Q.5	**(a)**	Explain Griffith's criterion for LEFM approach.	**07**
	(b)	Explain the different methods used to control crack growth.	**07**
		OR	
Q.5	**(a)**	Explain the fatigue damage analysis.	**07**
	(b)	Explain the Crack growth resistance curve (R-curve).	**07**

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