Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME SEMESTER II • EXAMINATION – SUMMER 2017

Subject Code:2722802 **Date:25/05/2017**

Subject Name: Advanced Welding Technology

Time:02:30 PM to 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)**	What is the use of schaeffler's diagram? Explain in detail.	**07**
	(b)	Write short note on 'Welding of Plastics and Ceramics".	**07**
Q.2	**(a)**	Discuss the selection factors for power sources.	**07**
	(b)	List the various non-traditional welding processes. Explain with neat sketch how LASER beam is generated? Differentiate between keyhole welding and conduction mode welding in LBW process with its controlling process parameters.	**07**
		OR	
	(b)	Explain with neat sketch the Plasma Arc Welding process. Compare and contrast between un transferred and transferred plasma arc process and discuss its process parameters, merits-demerits and applications.	**07**
Q.3	**(a)**	Why coating of electrode is necessary? Discuss the role of flux ingredients and shielding gases. What is the effect of carbon, manganese, silicon and nickel in welding?	**07**
	(b)	Discuss various types of electrode codes and their critical evaluation.	**07**
		OR	
Q.3	**(a)**	Explain the various forces affecting the transfer of material in welding. Also describe the different modes of metal transfer in welding process.	**07**
	(b)	Write brief note on process parameters, advantages and limitations of welding of composite materials.	**07**
Q.4	**(a)**	Define weldability. Explain effects of alloying elements on weldability. What is the purpose of weldability test? Give the classification of weldability tests and explain hot cracking test with neat sketch.	**07**
	(b)	Define residual stresses. Explain the causes of the development of residual stresses and effects of weld thermal cycle on residual stresses.	**07**
		OR	
Q.4	**(a)**	Define Welding Arc. What is arc blow? Discuss the mechanism of arc blow. Write the effects and remedies of arc blow.	**07**
	(b)	What is welding distortion? Discuss the significance of material properties, influence of welding process and process parameters for welding distortion.	**07**
Q.5	**(a)**	Elaborate typical residual stresses in weldments.	**07**
	(b)	Write down methods of weldability testing.	**07**
		OR	
Q.5	**(a)**	Discuss welding parameters on heat distribution. How can we calculate cooling rate in welding?	**07**
	(b)	Describe fatigue mechanism observed in welded joints. Explain in brief the factors affecting the fatigue life of welded joint.	**07**

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