Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER – II • EXAMINATION – SUMMER 2017

Subject Code: 1722802 **Date:10/05/2017**

Subject Name: Advanced Welding Technology

Time:10:30 A.M. to 01:00 P.M. **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)**	Explain the physics of metal joining and give their mode of metal transfer.	**07**
	(b)	State the factors to be considered for selecting a welding power source. Also Explain how the power source influences welding quality?	**07**
Q.2	**(a)**	What is duty cycle and polarity? Which polarity needed for similar and dissimilar material welding? Which maximum output current can be drawn at 100% duty cycle from a welding power source rated at 500A at 60% duty cycle?	**07**
	(b)	What is coating factor? What factor affects electrode selection? Briefly discuss IS standards organisation system of coding of mild steel and low alloy steel electrodes. How does it's differ from Indian standard system?	**07**

OR

	(b)	How the welding arc, molten droplets and newly deposited weld bead is protected from oxygen and nitrogen present in open air? How weld metal composition is controlled?	**07**
Q.3	**(a)**	Explain the relationship between weldment and energy input.	**07**
	(b)	What is cooling rate in welding? What is relative plate thickness factor for thin and thick plate for calculating cooling rates?	**07**

OR

Q.3	**(a)**	What is OCV? Discuss its significance in arc welding. Also discuss arc characteristics in contest of OCV.	**07**
	(b)	Explain the factors affecting the weldability. What is the purpose of weldability test? Explain controlled thermal severity (CTS) test with neat sketch.	**07**
Q.4	**(a)**	Write role of WPS, WPQ and PQR in quality assurance in welding. Prepare WPS for 20 mm thick SA 515 Gr 60 plate material, SMAW process, 1G weld position.	**07**
	(b)	How to maintain safety in welding? Explain the various arc radiations, fumes and dust effect on welder.	**07**

OR

Q.4	**(a)**	Find the standard time for cutting strips 15m long from plates 10mm and 60mm thick, using a manual oxy- acetylene cutting torch.	**07**

	(b)	With a schematic diagram, explain how ceramics can be welded with metal. State the major difficulties in welding of dissimilar metals.	**07**
Q.5	**(a)**	How to run automated welding system? Describe welding robot application for automobile industries.	**07**
	(b)	Explain the process of underwater welding with advantages, disadvantages and application.	**07**

OR

Q.5	**(a)**	Explain in brief: Welding of composite materials.	**07**
	(b)	Give the difference between EBW and LBW also contrast their feature and process application. Justify which process give better results?	**07**