

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. Sem. – IInd - Examination – June/July- 2011****Subject code: 1722802****Subject Name: Advance Welding Technology****Date: 24/06/2011****Time: 10:30 am – 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.

- Q.1 (a)** Discuss the concept of heat input and heat intensity with respect to the development of conventional and modern welding processes. Name the high heat input welding and high heat intensity welding process. **07**
- (b)** What are the important factors that influence the metal transfer in an automatic welding process? Bring out the special features of spray metal transfer and short circuited metal transfer in MIG **07**
- Q.2 (a)** What are the important variables in arc welding and how do they affect penetration, bead width and reinforcement? How does the selection of a flux affect the chemistry and mechanism of weld metals? **07**
- (b)** Describe the important characteristics of coating materials and their effects on steel weld metal. Differentiate between cellulosic electrodes and rutile electrodes. **07**
- OR**
- (b)** What are the various problems with welding of aluminium alloys? Suggest and justify to solve them. **07**
- Q.3 (a)** Compare the power sources for manual metal arc, TIG and submerged arc welding processes. **07**
- (b)** Write short note on “Welding of stainless steel”. **07**
- OR**
- Q.3 (a)** Explain different methods by which residual stresses in welded joints can be reduced or relieved. **07**
- (b)** Write short note on “Fracture toughness test” **07**
- Q.4 (a)** Describe the methods to measure the Longitudinal distortion and Angular distortion. State the design consideration to minimise distortion. **07**
- (b)** Write short note on “Effect of various defects on fatigue strength of welded joints”. **07**
- OR**
- Q.4 (a)** Discuss the various methods by which fatigue behavior of welded structures and connection can be improved. **07**
- (b)** Write short note on “Welding fumes and their effect on the environment”. **07**
- Q.5 (a)** Explain with neat sketch the Electron Beam Welding process and discuss its process parameters, merits-demerits and applications. **07**
- (b)** Describe the Principle of Laser Beam Welding process with neat sketch, its process parameters, merits-demerits and applications. **07**
- OR**
- Q.5 (a)** Explain with neat sketch the Ultrasonic Welding process and discuss its process parameters, merits-demerits and applications. **07**
- (b)** With a schematic diagram, explain how ceramics can be welded with metal. State the major difficulties in welding of dissimilar metals. **07**
