

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E –IIst SEMESTER–EXAMINATION – JULY- 2012****Subject code: 1722802****Date: 09/07/2012****Subject Name: Advance Welding Technology****Time: 10:30 am – 13:00 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) Define Welding Arc. What is arc blow? Discuss the mechanism of arc blow. Write the effects and remedies of arc blow. **07**
- (b) Explain the various forces affecting the transfer of material in welding. Also describe the different modes of metal transfer in welding process. **07**

- Q.2** (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) 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**

OR

- (b) Discuss the problems experienced during the welding of Cast Iron and give their remedies. Enlist the various welding processes for Grey Cast Iron. Explain braze welding with its process parameters, merits and demerits. **07**

- Q.3** (a) Describe the weldability considerations for austenitic stainless steel and straight chromium stainless steel. Describe in brief the process used for welding stainless steel. **07**
- (b) What is the importance of heat flow phenomena and cooling rate in welding process? Describe the heat flow analysis in Resistance Spot welding process. **07**

OR

- Q.3** (a) Define residual stresses. Explain the causes of the development of residual stresses and effects of weld thermal cycle on residual stresses. **07**
- (b) Give the classification of measurement for residual stresses in weldments. With schematic illustration explain hole-drilling method for residual stress measurement. **07**

- Q.4** (a) What is welding distortion? Discuss the significance of material properties, influence of welding process and process parameters for welding distortion. **07**
- (b) Describe in brief the different types of welding distortion and explain methods for correcting the distorted weldments. **07**

OR

- Q.4** (a) Explain in detail the general design principles of weld joint design. Draw the neat sketches of weld joints for structural tubular connections. **07**
- (b) Describe fatigue mechanism observed in welded joints. Explain in brief the factors affecting the fatigue life of welded joint. **07**

- Q.5** (a) What is the need of underwater welding? Explain and compare various methods adopted for under water welding giving its process parameters, merits and demerits. **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

- Q.5** (a) 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**
- (b) Write short note on ‘Welding of Plastics and Ceramics’. **07**

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