

GUJARAT TECHNOLOGICAL UNIVERSITY
Diploma Engineering - SEMESTER-V • Examination – WINTER • 2014

Subject Code: 3355503**Date: 02-12-2014****Subject Name: Welding Metallurgy****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.
4. English version is considered to be Authentic.

- Q.1 (a) Write definition of welding arc and draw iso thermal map of 100amp 07
 (b) Calculate cooling rate of weld joint from following data. 07
 $T_o=25^{\circ}\text{C}$, $T_c = 550^{\circ}$, $t= 6\text{mm}$, $f=0.9$, $E = 25\text{V}$, $v=8\text{mm/sec.}$, $I = 300\text{amps}$ and $PC=0.0044\text{J/mm}^3$, $^{\circ}\text{C}$, $K = 41 \text{ J/mm.s } ^{\circ}\text{C}$
- Q.2 (a) Explain weld metal solidification of with neat sketch. 07
 (b) Explain gas metal reaction with neat sketch. 07
 OR
 (b) Draw neat sketch of different zones of steel weldment as represents on an IC diagram. 07
- Q.3 (a) Draw neat sketch of TTT diagram use for welding and show different micro structure observed in it. 07
 (b) Draw CCT diagram and show different transformation. 07
 OR
- Q.3 (a) Explain weld ability of HSLA steel 07
 (b) Prepare WPS from given data. 07
 1. Design code : ASME section VIII Div.1
 2. Specification standard : ASME section IX
 3. Base metal : 10 mm thick SA515 GR 60
 4. Welding process : SMAW
 5. Joint Design : Single "V"
 6. Filler metal : AWS SFA 5.1 E-7018
 7. PWHT : NIL
- Q.4 (a) Explain carbide precipitation problem in welding of austenitic stainless steel and suggest its remedies. 07
 (b) Explain welding characteristics of ferritic and martensitic stainless steel 07
 OR
- Q. 4 (a) Explain schaeffler diagram with neat sketch 07
 (b) List different techniques used for welding of austenitic stainless steel and explain any one with neat sketch. 07
- Q.5 (a) Explain welding characteristics of aluminium. 07
 (b) List different welding processes used for titanium welding. 07
 Explain plasma arc welding process with neat sketch.
- OR
- Q.5 (a) Explain effect of thermal stresses in weld. 07
 (b) Explain concept and types of distortion with neat sketch 07
