

**GUJARAT TECHNOLOGICAL UNIVERSITY****DIPLOMA ENGINEERING - SEMESTER-V • EXAMINATION – SUMMER 2013****Subject Code: 355503****Date: 16-05-2013****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.

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|-------------|---|----|
| <b>Q.1</b>  | (a) Define the term welding metallurgy and explain different zones of weld joint with neat sketch                           | 07 |
|             | (b) State characteristic of good welding engineer for welding metallurgy department.  | 07 |
| <b>Q.2</b>  | (a) Draw IC diagram and explain eutectoid, eutectic and peritectic reactions  | 07 |
|             | (b) Write limitation of IC diagram and explain how this limitation is overcome by TTT diagram with neat sketch              | 07 |
|             | OR  |    |
|             | (b) Explain effect of Gas-Metal reaction in welding   | 07 |
| <b>Q.3</b>  | (a) Explain effect of electrode polarity and magnetic field in welding with neat sketch                                     | 07 |
|             | (b) Explain Hot cracking and Cold cracking with neat sketch   | 07 |
|             | OR  |    |
| <b>Q.3</b>  | (a) Explain weldability of Microalloyed or HSLA steels  | 07 |
|             | (b) Make WPS from following data  | 07 |
|             | 1. Design code : ASME section VIII Div.1  |    |
|             | 2. Specification standard : ASME section IX   |    |
|             | 3. Base metal : 25 mm thick SA515 GR 70   |    |
|             | 4. Welding process : SMAW   |    |
|             | 5. Joint Design : Double "V"  |    |
|             | 6. Filler metal : AWS SFA 5.1 E-7018  |    |
|             | 7. PWHT : NIL   |    |
| <b>Q.4</b>  | (a) Explain weld ability related problems in Austenitic Stainless Steel   | 07 |
|             | (b) Explain Schaeffler Diagram with neat sketch   | 07 |
|             | OR  |    |
| <b>Q. 4</b> | (a) Explain welding metallurgy of Ferritic Stainless Steel  | 07 |
|             | (b) Explain welding characteristics of gray cast iron. List different welding processes used for welding of grey cast iron. | 07 |
| <b>Q.5</b>  | (a) Explain welding metallurgy of aluminium alloys and list different processes used for it.                                | 07 |
|             | (b) Explain different factors influencing joint integrity in dissimilar welding   | 07 |
|             | OR  |    |
| <b>Q.5</b>  | (a) List different procedures for Stainless steel weld cladding and   | 07 |

- explain any one
- (b) Explain different factors influencing residual stresses in welding 07

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