

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**DIPLOMA ENGINEERING – SEMESTER –V • EXAMINATION – SUMMER 2015**

**Subject Code: 355503****Date: 07 /05 /2015****Subject Name: WELDING METALLURGY****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Each question carry equal marks (14 marks)

- Q.1** (a) Explain BCC, FCC, and HCP structure of metal with neat sketch. **07**  
(b) Write limitation IC diagram. Explain TTT diagram with neat sketch. **07**
- Q.2** (a) Explain following terms briefly. **07**  
1) Weld metal.  
2) Solidification of weld.  
3) Ingotism.  
(b) Explain gas metal reaction with neat sketch. **07**
- OR
- (b) Explain energy input and distribution in welding with neat sketch. **07**
- Q.3** (a) Explain HIC in welding. **07**  
(b) Explain Strain age embrittlement and Temper embrittlement in welding. **07**
- OR
- Q.3** (a) Define the terms: 1) WPS, 2) WPQ, 3) PQR, 4) Essential variable, 5) Non-essential variable, 6) Supplementary essential variable, 7) P-Number 8) F-Number 9) A-Number **07**  
(b) Prepare WPS from following data (SMAW) **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
- Q.4** (a) Explain weldability consideration of austenitic stainless steel. **07**  
(b) Explain Schaeffler diagram with neat sketch **07**
- OR
- Q.4** (a) Explain keyhole PAW process for SS welding. Write main benefit of this process. **07**  
(b) Prepare list of different process for welding ferrite and martensitic stainless steel and explain any one process with neat sketch. **07**
- Q.5** (a) Prepare list of different procedure used for welding gray cast iron **07**  
Explain oxy-acetylene welding technique.

(b) Explain different welding consideration in dissimilar metal welding. **07**

OR

**Q.5** (a) Explain different factors influencing residual stress in weldment. **07**

(b) Prepare list of different process used for welding Aluminum and explain GTAW process **07**

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