WELDING

THEORY – II

INTRODUCTION :

About trade, Elementary First aid, safety precautions in Arc-welding, Description of tools and Equipment in Arc welding current and voltage, Electrodes for Arc welding (Different types), Arc welding Methods (Carbon Arc, Metal Arc, Metal inert gas Arc (MIG), Gas – tungsten Arc (TIG), Atomic Hydrogen Arc, Submerged Arc, Flux Cored Arc , Types of Joints, Resistance welding methods (Spot, seam welding, projection welding, Butt welding) Welding defects (Internal & External), Identification of weldability methods of welding test (Destructive test, Non destructive test, Semi-destructive test)

TIG WELDING :

Equipment, process, Advantages, Limitations, Electrodes, classification of electrodes, (Thoriated Tungsten, Ceriated Tungston, Lanthanated Tungston, Zironiated Tungston – Electrode tip configuration , Electrode contamination, power sources, Direct current, pulsed DC welding, Alternating current, Types of shielding gases (Argon, Helium, Argon-hydrogen mixture), Gas flow rates, Back up purge, Arc initiation, High frequency Start, process variables, Arc current, Arc voltage, Travel speed, Wire feed, Techniques, Manual welding machine welding, Automatic welding, joint tolerance, cleaning, Discontinuities and defects, Application, safety in TIG welding, Radiation energy hazard, Color Codes and alloying elements for various tungston electrode Alloys, Recommended Tungston electrodes and gas cups for various welding currents, Development in TIG welding pulsed TIG welding, Hot wire tig welding, TIG spot welding magnetic Arc control TIG welding Multi electrode TIG welding.

SHOP TRAINING :

Cutting of sheet metal position welding of horizontal vertical oblique and overhead weld Gauges. Pipe welding, copper welding, bronze welding, Aluminium welding, brass welding, Hard facing Aluminium brazing arc of resistence. Welding machines spot butt and seam. Welding with low heat input electrode wires and Flexes. Power spray by torch method testing welding machines of production work observation of machinery used in fabrication shops.

BASIC ELECTRICITY APPLIED TO ELECTRIC ARC WELDING :

Definitions of Electrical units Heating effect of Current, Electro-Magnetic Induction, Fleming's Rule Electro-magnetism applied to A.C. Generators Frequency, D.C. Generators, Transformer.

ARC WELDING EQUIPMENT :

Welding Plant, Transformer, Type A.C Plant various Welding Accessories.

ELECTRIC WELDING :

Principles of Electric Welding, Electric Arc Welding, circuit AC Electric Welding, Length of Arc straight and Reverse polarity, comparison of A.C, D.C Arc welding Characteristic of Arc, Angularity of Electrode to work, striking the Arc, Arc blow, laying Long Beads, Weaving the electrode, Building a Weld pad or building Dequence of Operations for filled weld, Types of welded joints, Edge preparations, Welding procedure, Welding Positions, The Welder's Trouble shooter, Various types of Electric Arc of Fusion of Welding processes, Metal Electrode Welding, Inter Gas Sheilded Arc Welding, Carbon Electrode Welding, Atomic Hydrogen, Arc Welding, Submerged Arc methods of Welding, Brazing, soldering, Solder, Thermit Welding, Resistance Welding, Industrial application of Welding.

ARC WELDING ELECTRODE : Coated Electrode preferred over bare electrodes, different types of Fluxes used on Electrode and Functions, Electrode size, Classification and coating of Covered Electrode, Special Electrodes, Different Types of Electrode manufactures in India. Comparative Chart of Electrode of Indian Manufacture.

WELDING OF DIFFERENT METALS AND SPECIAL APPLICATIONS OF WELDING :

Weldability, Welding of Mild/steel, Medium carbon steel, High carbon Steel, Welding of Cast Iron, stud Welding of cast iron etc. Few special Applications of Welding, Hard Facing, Tripping of Tools, Arc cutting of Metals, Welding with the aid of Jigs and Fixtures.