

# Arc and Gas Welder

## Theory Contents

### Section-A

Introduction to welding. Safety precautions. Types of welding processes and application. Metals and weldability-Mild Steel, Alloy Steel, Cast iron, Copper and Brass.

Linear measurements: metric and inches, Angular measurements. Marking practice using Steel rule using metric and inches scale Nomenclature of Fillet and groove welds.

Welding terms and definitions.

### Section-B

Description and operating procedures of oxy-Acetylene welding and cutting equipments. Description and safe operating procedures of oxy-acetylene regulators Description & maintenance of oxy Acetylene welding and cutting blow pipes Types of Oxy-Acetylene flames and their uses

Gas Welding parameters - selection of Nozzle size and Oxy acetylene gas pressure to cut different thickness of metals, Gas welding filler rods and fluxes and welding techniques. Brazing principles, selection of nozzle size, filler metals and fluxes.

Gas cutting parameters - selection of Nozzle size and Oxy acetylene gas pressure to cut different thickness of plates Gas Welding, brazing and cutting defects, their causes and remedy.

### Section-C

Principles of Shielded Metal Arc Welding (SMAW), advantages and limitations.

Arc welding power source, AC Transformers, DC welding rectifier, DC generators. Types of weld joints and edge preparation and fit up. Arc Welding electrodes and selection, Coding of SMAW electrodes. Arc welding procedure and technique, Welding defects in SMAW, causes and remedy, Distortion and methods of control, Inspection and Testing of Welds.

## Practical Work

1. Safety measures
  - a. Use of protective safety devices on shop floor.
  - b. Safe working practice to be observed during welding.
  - c. Introduction to safety equipment and their uses.
2. Identification of tools and accessories used for
  - a. Gas welding
  - b. Gas cutting and Arc welding
  - c. Setting up of Oxy Acetylene Gas welding plant and making fusion runs on MS sheet in flat position.
3. Produce following welded joints in mild steel sheet in Flat positions by Gas welding
  - a. Fillet Lap
  - b. Fillet T joints
  - c. Outside corner joint
  - d. Square butt joint
4. Produce following welded joints in mild steel sheet in Horizontal positions by Gas welding
  - a. Fillet Lap
  - b. Fillet T joints
  - c. Outside corner joint
  - d. Square butt joint
5. Produce following welded joints in mild steel sheet in Vertical positions by Gas welding
  - a. Fillet Lap
  - b. Fillet T joints
  - c. Outside corner joint
  - d. Square butt joint
6. Produce Square but, lap and T joint on MS sheet by Brazing Setting up of Oxy Acetylene Gas Cutting plant and cutting M.S Flats to the given size.
7. Marking and punching the required shapes by using different shapes and sizes by using templates on M.S plates.
8. Cutting circular work pieces to the given size by Gas cutting.
9. Practice to cut different thickness of plates.
10. Beveling and preparation of joint edges by Gas Cutting.

11. Setting up Arc Welding plant and depositing straight and weaving beads on MS in Flat position.

12. Produce arc welded joints:

a. Fillet SMAW in 1F, 2F, 3F and 4F positions

b. Fillet lap joint on M.S. by SMAW in flat position

c. Outside corner joint on MS by SMAW in flat position d. SMAW in 1G, 2G, 3G and 4G position.

13. Identification of defects SMAW welded joints by Visual inspection & correction of defects Measurement of weld using gauges.