

LESSON PLAN

Date _____

Trade:- Welder

Name _____

Week No:- Three

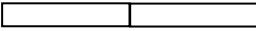
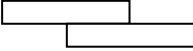
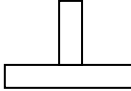
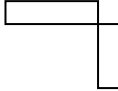

Subject :- Different process of metal joining, bolting, riveting, soldering, brazing and seaming. Types of welding joint and its applications, edge preparation and fit up for different thickness. Surface cleaning.

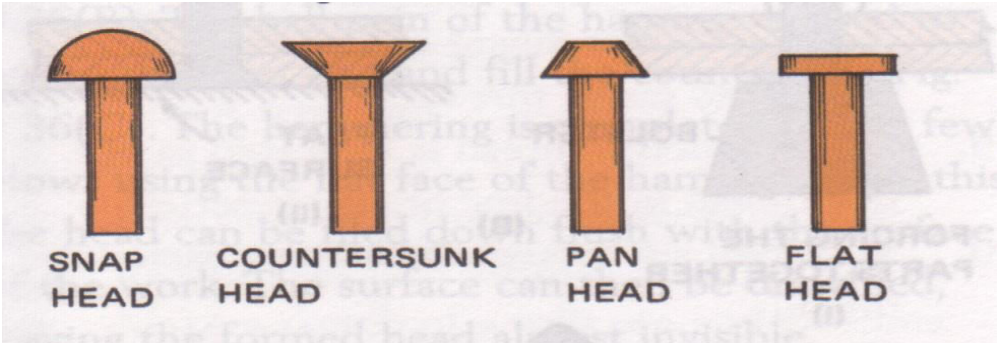
Motivations:- in previous week we learned about :- Introduction and definition of welding. Arc and gas welding equipments , tools and accessories. Various welding process and its application. Arc and gas welding terms and definitions.

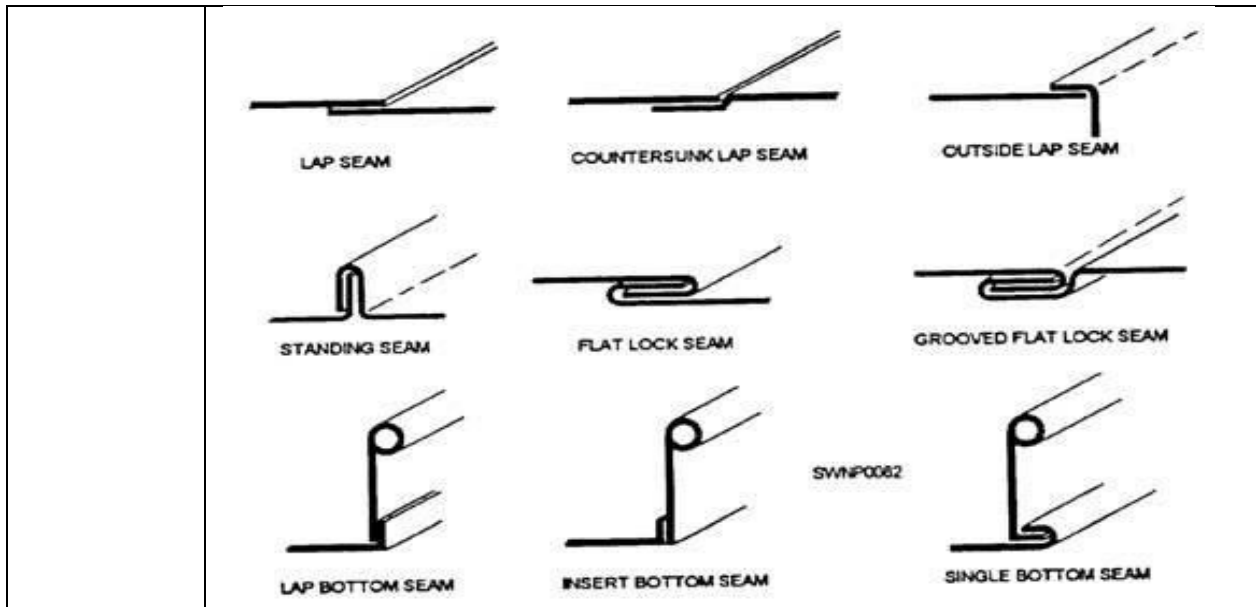
PREPARATION:- Teaching Aids:-Chalk ,Charts,

INTRODUCTION:- Joining process done by three types, temporary, semi-temporary and permanent. A welder weld the joint/ make the joint with these process.

PRESENTATION:-

Topic	Information Point	Spot Hint
Joining process	Metal joint done by three types.	
Temporary Joint	This joint join in temporary stage if needed reopen and rejoin. Example- Nut bolt, stud, carter key and screw.	
Semi temporary joint	In this process when joint reopen only joining materials damage, job have no defects. Example- Riveting and soldering.	
Permanent Joint	In this process joint made permanent and if reopen then job and joining materials both damaged. Example- Welding and brazing.	
Types of joint	<p>Joint are five types.</p> <ol style="list-style-type: none"> 1. Butt joint  2. Lap joint  3. Tee Joint  4. Corner Joint  5. Edge joint  	

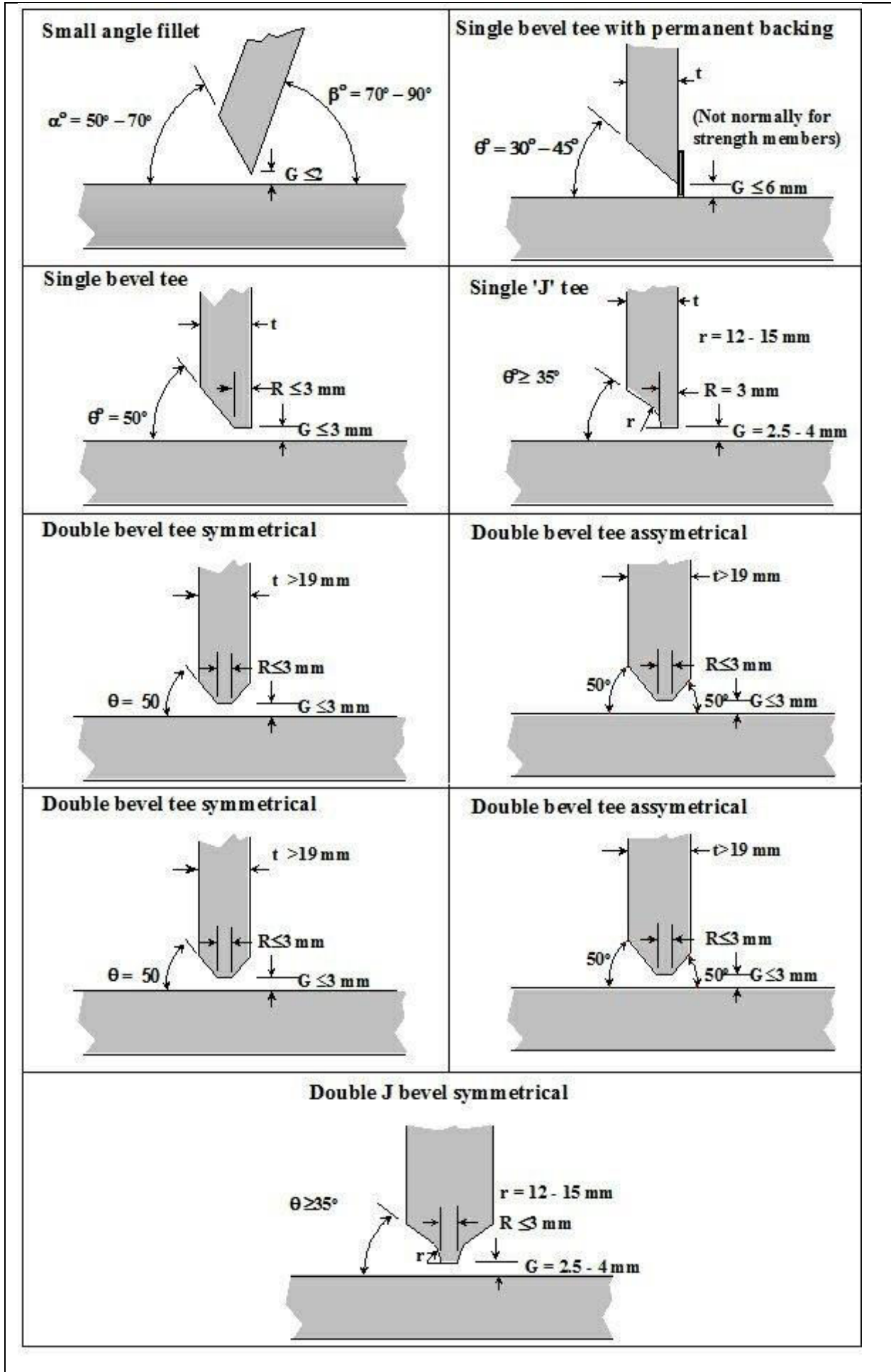
<p>Brazing</p>	<p>It is a low temperature joining process. It is performed at temperatures above 840° F and it generally affords strengths comparable to those of the metal which it joins. It is low temperature in that it is done below the melting point of the base metal. It is achieved by diffusion without fusion (melting) of the base.</p> <p>Brazing can be classified as</p> <ol style="list-style-type: none"> 1. Torch brazing 2. Dip brazing 3. Furnace brazing 4. Induction brazing <p><u>Advantages</u></p> <ul style="list-style-type: none"> • Dissimilar metals which cannot be welded can be joined by brazing • Very thin metals can be joined • Metals with different thickness can be joined easily • In brazing thermal stresses are not produced in the work piece. Hence there is no distortion • Using this process, carbides tips are brazed on the steel tool holders <p><u>Disadvantages</u></p> <ul style="list-style-type: none"> • Brazed joints have lesser strength compared to welding • Joint preparation cost is more • Can be used for thin sheet metal sections
<p>Soldering</p>	<ul style="list-style-type: none"> • It is a low temperature joining process. It is performed at temperatures below 840°F for joining. • Soldering is used for, <ul style="list-style-type: none"> Sealing, as in automotive radiators or tin cans • Electrical Connections • Joining thermally sensitive components • Joining dissimilar metals
<p>Bolting</p>	<p>Bolting joint completed by nut bolt. In this process drill the job and tight the nut bolt in hole.</p> <p>Limitation- joint only lap.</p>
<p>Riveting</p>	<p>Riveting is like as bolting with some difference. I riveting process first drill the job on desired place and choose rivet and complete process.</p> <p>Rivet joint are semi temporary joint and rivet not in use after reopen joint.</p> <div style="text-align: center;">  <p>The diagram illustrates four different types of rivets, each with a distinct head shape. From left to right: 1. Snap Head: A rivet with a rounded, dome-shaped head. 2. Countersunk Head: A rivet with a conical head that fits into a matching hole in the metal. 3. Pan Head: A rivet with a flat, hexagonal head. 4. Flat Head: A rivet with a simple, flat, rectangular head.</p> </div>
<p>Seaming</p>	<p>This joint is very popular in sheet metal work. In this process bend the both sheet and fix with each other then use pressure to complete.</p>















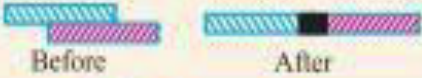









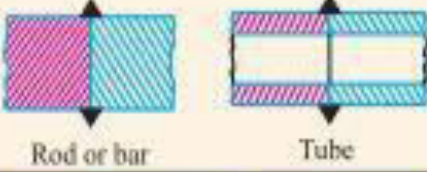

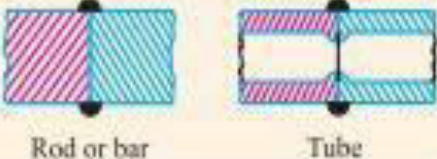



Edge preparation for different weld joint

Edge preparation of weld joint is soul of joints. It depends on following points. 1. Size of job. 2. Use of job 3. Types of joint

Thick-ness of metal	Diameter of welding rod	Edge preparation	Speed ft per hour	Thick-ness of metal
Less than 20 swg	1/64-1/32in		25-30	1/32in
20 swg - 1/16in	1/16in-1/8in		20-25	1/16in
1/16in-1/8in	1/8in-1/4in		20-25	1/16in
1/8in-1/4in	1/8in-1/2in		18-20	1/8in
1/4in-1/2in	1/4in-1/2in		15-18	1/16in
1/2in-1in	1/2in-1in		12-15	1/8in
1in and over	1in		10-12	1/4in
			7-8	1/8in
			6-7	1/16in
			4 1/2-5	1/4in
			3 1/2-4 1/2	1/8in
			3-3 1/2	1/4in
			2-2 1/2	1in



S. No.	Form of weld	Sectional representation	Symbol
9.	Single-J butt		
10.	Double-J butt		
11.	Bead (edge or seal)		
12.	Stud		
13.	Sealing run		
14.	Spot		
15.	Seam		
16.	Mashed seam		
17.	Plug		
18.	Backing strip		
19.	Stitch		
20.	Projection		
21.	Flash		
22.	Butt resistance or pressure (upset)		

Surface Cleaning

Removal of sand from casting surface and otherwise enhancing appearance of surface

- Cleaning methods: tumbling, air-blasting with coarse sand grit or metal shot, wire brushing, buffing, and chemical pickling
- Surface cleaning is most important for sand casting, whereas in many permanent mold processes, this step can be avoided
- Defects are possible in casting, and inspection is needed to detect their presence

Question:-

1. What is joining process and how many type it?
2. What is permanent joint?
3. What is Single V butt joint?

Next Week:-

Basic electricity to applicable in Arc welding and related electric terms and definitions. Heat and temperature and its term related to welding. Principle of arc welding and characteristics of arc.

Assignments:- Different process of metal joining, bolting, riveting, soldering, brazing and seaming. Types of welding joint and its applications, edge preparation and fit up for different thickness. Surface cleaning.

Checked By.....

Instructor.....