EXPERIMENT : 01

AIM OF THE EXPERIMENT:-

To make a drill on a round bar using lathe.

APPARATUS REQUIRED:-

SL NO	NAME OF THE APPARATUS	SPECIFICATION	QUANTITY
01	Drill bit	Ø16 mm	1
02	Drill chuck	1-12 mm	1
03	Socket/sleeve	1-2 "	1
04	Lathe	4'	1

RAW MATERIAL REQUIRED:-

MS ROD of diameter 50mm and length 100mm.

PROCEDURE:-

- At first the round bar is fitted on the lathe chuck properly by the help of a surface gauge & chuck key.
- Then facing operation is done on the job and after that plain turning is done.
- Locate the centre of the work piece by using tailstock.
- Now the dead centre is removed from the tailstock and a socket with sleeve and a drill bit fitted into it.
- Now we run the lathe machine by making power switch on.
- After this the drill bit is required to move forward by the tail stock hand wheel which will penetrate into the rotated job and drilled the required sized hole.

CONCLUSION:-

Finally we made a drill (Ø16 mm) on the given round bar.

EXPERIMENT : 02

AIM OF THE EXPERIMENT:-

To do boring operation on a work piece using lathe.

APPARATUS REQUIRED:-

SL NO	NAME OF THE APPARATUS	SPECIFICATION	QUANTITY
01	Drill bit	Ø16 mm	1
02	Drill chuck	1-12 mm	1
03	Socket/Sleeve	1-2''	1
04	Lathe	4'	1
05	Boring tool	4"	1

RAW MATERIAL REQUIRED:-

MS ROD of diameter 50mm and length 100mm.

PROCEDURE:-

- At first the workpiece is fitted properly on the lathe chuck by the help of a surface gauge & chuck key.
- Then facing and plain turning is done on the workpiece.
- The center of the workpiece is located by the help of tail stock.
- Now we run the lathe machine by making power switch on
- Now a drill bit is to be fitted with the tail stock and to be locked and then the drill will penetrated in to the rotating workpiece and sufficient feed is given until the required drilling is done.
- After drilling, the drill bit is removed and a boring tool is fitted into the toolpost.
- Then the boring operation is done by the boring tool which is generally used to enlarge the drilled hole.

CONCLUSION:-

Finally we did the boring operation on the given round bar.

EXPERIMENT : 03

AIM OF THE EXPERIMENT:-

Internal V-thread cutting by the help of a V-thread cutting tool using lathe.

APPARATUS REQUIRED:-

SL NO	NAME OF THE APPARATUS	SPECIFICATION	QUANTITY
01	Drill bit	Ø16 mm	1
02	Drill chuck	1-12 mm	1
03	V-thread cutting tool	HSS 4”	1
04	Lathe	4’	1

RAW MATERIAL REQUIRED:-

MS ROD of diameter 50mm and length 100mm.

PROCEDURE:-

- First of all the job will fitted in the lathe chuck and properly centred by surface gauge
- Then facing is done on the job and the centerheight was found out and marked by using dead center.
- Then fit the drill bit in the tail stock of lathe and locked it.
- Now we run the lathe machine by making power switch on
- The drill bit was allowed to penetrate into the workpiece with sufficient coolant.
- After drilling the drill bit was removed and the thread cutting tool is fitted into the toolpost.
- Then the thread cutting tool was allowed to go into the drilled hole slowly which cut the internal surface of the drilled hole and finally an internal V-thread will obtained.

CONCLUSION:-

Hence the internal V-threading is done successfully by the help of required machine and tool.

EXPERIMENT NO : 04

AIM OF THE EXPERIEMENT:

To make a job using Capstan Lathe.

APPARATUS REQUIRED:

SL NO.	NAME OF THE APPARATUS	SPECIFICATION	QUANTITY
01	Capstan turrentLathe	4’	01
02	Lathe Cutting Tool	4”	01
03	Chuck Key	100 mm	01
04	Box Spanner	10 mm	01

RAW MATERIAL REQUIRED:

M.S. Rod of Diameter 40mm and length 100mm.

PROCEDURE:

- At first the round bar is fitted on the lathe chuck properly by the help of a surface gauge & chuck key.
- Then checked out the centring of the job and tool by the help of surface gauge and dead centre respectively.
- Now we run the lathe machine by making power switch on.
- Then various operations are done by the help of capstan lathe successfully.

CONCLUSION:

In this way we can prepare a job using Capstan Turret lathe.

EXPERIMENT NO : 05

AIM OF THE EXPERIEMENT:

To prepare a Butt Joint through Arc welding.

APPARATUS REQUIRED:

SL NO.	NAME OF THE APPARATUS	SPECIFICATION	QUANTITY
01	Rough File	300mm	01
02	Arc welding Machine	350 amperes	01
03	Electrode Holder	300 amp/800 amp	01
04	Ground Clamp	100 mm	01
05	Tongs	300 mm	01
06	Welding Hand Screen	(108 x 82) mm	01
07	Hammer	Chipping Type	01
08	Apron	Lather	01
09	Gloves	lather	01 pair

RAW MATERIAL REQUIRED:

Two number of M.S Flat with dimension (80x40x6)mm.

PROCEDURE:

- The given M.S Flats are thoroughly cleaned .
- The two pieces of M.S Flat positioned on the welding table (as shown in figure) such that they are separated slightly for better weld joints and well penetration of the weld.
- Then electrode is fitted in the electrode holder and the welding current is to be set with proper value according to the requirement.
- Before welding operation some precaution has to be taken. These are wearing apron, using hand gloves and hand screen.
- The welding process is done with proper selection of welding parameters (accelerating voltage, welding current, welding speed) on the welding machine.

- Then welding is done by the help of electrode holder with filler metals, then arc is created by the contact with electrode and work piece.
- During the process of welding the electrode is kept at 15 to 25 degree angle from vertical and the direction of welding respectively.
- After welding operation is completed the scale formation on the welding zone is removed by the help of chipping hammer.

CONCLUSION:

The Butt Joint is thus made using above procedure.

EXPERIMENT NO : 06

AIM OF THE EXPERIEMENT:

To prepare a Lap Joint through Gas welding

APPARATUS REQUIRED:

SL NO.	NAME OF THE APPARATUS	SPECIFICATION	QUANTITY
01	Oxygen cylinder	7 m^3/120-150 Kg/cm^2	01
02	Acetylene Cylinder	6 m^3/15-16 Kg/cm^2	01
03	Hand Screen	(108 x 82) mm	01
04	Hammer(Chipping)	200 gm	01
05	Tongs	300 mm	02

RAW MATERIAL REQUIRED:

Two number of M.S Flat with dimension (75x40x6)mm.

PROCEDURE:

The given M.S Flats are thoroughly cleaned.

Before welding operation some precaution has to be taken. These are wearing apron using hand gloves, hand screen and Goggles.

Oxygen and acetylene are supplied through the different cylinder. Oxygen cylinder is painted in Black colour and acetylene cylinder is Marked in Maroon colour

The workpieces are positioned(as shown in figure) on the welding tableto form a lap joint with the required overlapping.

Then welding flame is required to fuse the metal by combination of acetylene and oxygen with proper value. Acetylene and oxygen are mixed together.

The alignment of the lap joint is checked and the tack-welded pieces are reset if required.

CONCLUSION:

The Lap Joint is thus made using above procedure.

EXPERIMENT NO : 07

AIM OF THE EXPERIEMENT:

Joining two non-ferrous parts through TIG /MIG.

APPARATUS REQUIRED:

SL NO.	NAME OF THE APPARATUS	SPECIFICATION	QUANTITY
01	MIG welding Transformer	50-80 amp	01
02	CO_2 cylinder	7 m^3	01
03	Hand screen	(180 x 80) mm	01
04	Hammer(Chipping)	Chipping type	01
05	Tongs	300 mm	02

RAW MATERIAL REQUIRED:

Two number of Aluminium Plates with dimension (75x40x6)mm.

PROCEDURE:

- ☞ The given Aluminium Plates are thoroughly cleaned.
- ☞ Before welding operation some precautions has to be taken. These are Wearing apron, using hand gloves, hand screen and Goggles.

- The work pieces are positioned (as shown in figure) on the welding table to form aproper joining.
- The alignment of the weld joint is properly checked.
- The welding operations are performed by using D.C with reverse polarity (Electrode +ve and Work piece -ve).
- A control unit is required which objective is to supply the power, wire drive, movement of the Gun and regulates the gas supply.
- This welding process uses consumable electrode which is fitted through the electrode holder into the arc and the same speed of the electrode is maintained in the welding process.
- A small adjustable speed motor is used to remove wire from a spool and feed it into the arc.
- In some cases various shielding gases (CO_2, He, Ar) for welding various types of carbon sheet.
- In this case the metal transfer occurs by heating both the consumable filler electrode and the work piece so that proper joining of aluminium plate takes place.

CONCLUSION:

By using TIG or MIG, we can join two non-ferrous parts.

EXPERIMENT NO : 08

AIM OF THE EXPERIEMENT:

Preparation of simple moulds.

APPARATUS REQUIRED:

SL NO.	NAME OF THE APPARATUS	SPECIFICATION	QUANTITY
01	Moulding Board	12” x 12” x 6”	01
02	Drag and Cope Boxes	12” x 12” x 3”	01
03	Hand Rammer	500 gms.	01
04	Strike of Bar	250 gms	01
05	Gaggers	200 mm	01
06	Wood pattern	250 mm x 40 mm x 40	01
08	Vent Rod and Draw Spike	200 mm	01

09	Trowel	100 gm	04
10	Slick	150 mm	02
11	Lifter	100 gm	01
12	Sprue	250 mm	01
13	Runner	90 mm	01
16	Rapping plate	50 gm	05
17	Clamps	50 gm	04

RAW MATERIAL REQUIRED:

01	Moulding Sand	Green sand
02	Parting sand	Dry sand
03	Green Sand	Natural Sand

PROCEDURE:

- To prepare mould green sand is used as a raw material. Green sand is sand collected from natural resources which contains water as a binder.
- For moulding a moulding box is made in two parts. Upper part is called cope and the lower part is called drag.
- Two parts (Cope and drag) are fitted with a suitable clamping and locating device.
- Clamping prevents the cope for lifting due to pressure of molten metal and locating device enable the two parts to maintain proper alignment at all times.
- In this method, the drag and pattern are placed on the moulding board and the sand is rammed in drag.
- The drag is then rolled over the board.

- ☞ The other part of the pattern is fitted over button 1 and cope is placed over the drag.
- ☞ Sprue pin and riser pin are placed in position and sand filled in the cope and rammed.
- ☞ The mould is vented sprue and riser pin removed.
- ☞ Then mould is parted off, pattern with drawn, mould cavity cleaned and gate cut in the drag.
- ☞ Core is placed in the positioned and clamped to make the mould ready for pouring.

CONCLUSION:

It is conclude that the sand mould perform as a container into which molten metal is poured and allowed to solidify which is necessary part of casting

EXPERIMENT NO : 09

AIM OF THE EXPERIEMENT:

Preparation of cores.

APPARATUS REQUIRED:

SL NO.	NAME OF THE APPARATUS	SPECIFICATION	QUANTITY

01	Hand Ramming	---	500 gm
02	Strike of bar	250 gs	01
03	Vent Rods	200 mm	01
04	Baking Sand	Dry sand	500 gm
05	Paste	Linseed oil	250 gms
06	Bellows	100 gm	02

RAW MATERIAL REQUIRED:

1. Core Sand- Green Sand (With Moisture)
2. Dry Sand
3. Core Binders or Core Oils (Linseed oil or Resin)

PROCEDURE:

- Hollow components can be produced by inserting a core into a cavity in the mould.
- Cores are generally made of green sand or dry sand.
- In core making sand is mixed with binder (Core Binder) is used to give strength after backing.
- A natural binder (Sometimes called core gums) is linseed oil.
- Generally core oil or core binder is composed of 50% to 60% linseed oil, 25% resin and balanced material oil are used as economical core oil to produce better core.
- Fore core making, various steps are required
    a) Ramming of Core sand in the box
    b) Venting
    c) Reinforcing
    d) Removing core from the box
    e) Backing
    f) Pasting

- Core is produced by the hand or by some machine.
- In machining moulding the core sand mixture is rammed by jolting, squeezing by means of suitable machine, then venting reinforcing and other operation are carried out by hand.
- Cores are generally made by core blowing machine in which core sand is placed in small hopper over the clamped core box and blown under a pressure of 5 to 8 kg/cm^2.

CONCLUSION:

So core is a predetermined shaped mass of green sand or drag sand with core binder which is made separately from mould