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BATCH:- A3

Q1) Write down the answers of the following questions in Two Three sentences.

a) What is Debarring?

→ Debarring is a material modification process that removes sharp edges from the material and leaves smooth edges. It is commonly performed on Machine Operations.

b) For what purpose Twist Drills are used?

→ A Twist drill is cutting tool that used to create holes in the work piece. The process is known as drilling. The general purpose drill bit to create a hole in wood, plastic, metal and other materials. They are also used to create through holes in the PCB, drill through wall studs etc.

c) What are the three Filing methods used in fitting Shop?

→ There are several methods of filing, each with a specific purpose. the following may be noted :-

- Cross filling :- It is the most common method of filing. Cross filling is carried out across two diagonals, to produce medium surface finish. It is used when large amounts of metal is to be removed. By cross filing 'rounding' the surface is reduced.

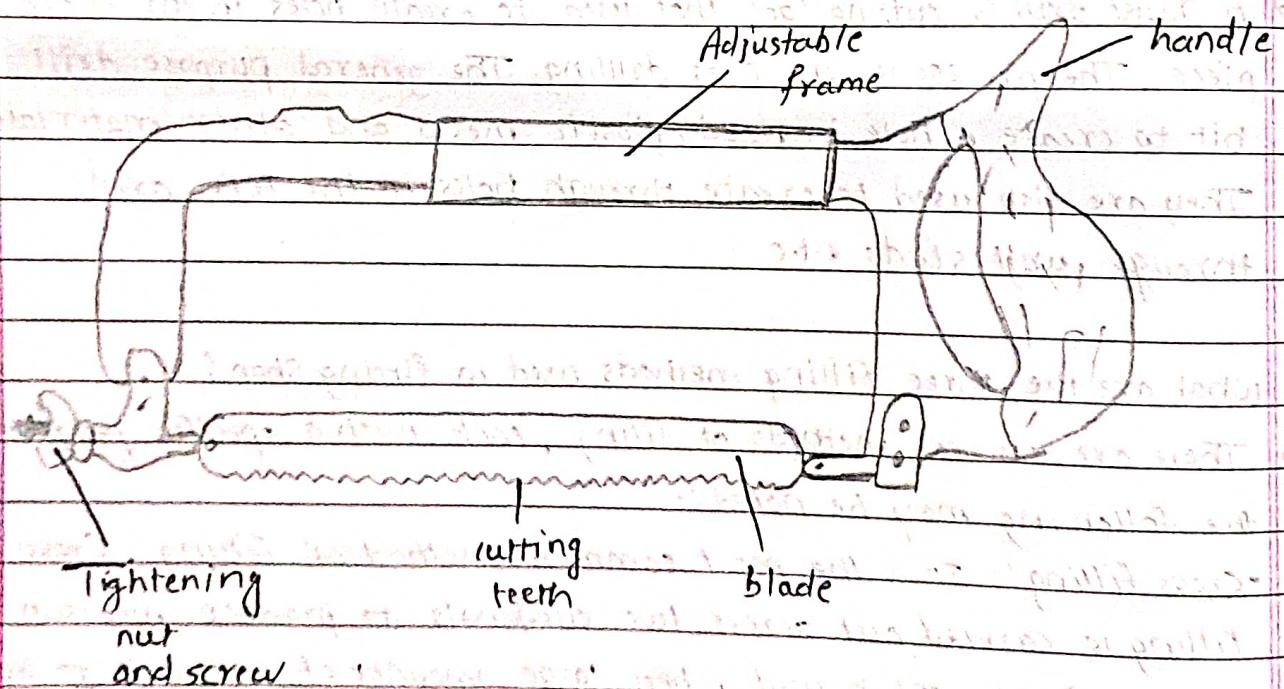
- Straight filling :- When a short length of workpiece is used to have a flat surface, straight filling is used. File marks made during cross filing may be removed, to produce a relatively smooth surface.

- Draw filling :- It is done to get a finely finished surface. It produces a smoother surface finish than straight filling. A smooth or dead smooth flat file is used for this.

(Q2) Explain in brief with labeled diagram what is Hack saw? types of frames, types of blades and use of Hack saw?

→ Hacksaw consists of a frame which holds a thin blade, firmly in position. The blade has a number of cutting teeth. The number of teeth per 25 mm of the blade length or teeth per inch (TPI) is selected on the basis of the work material and thickness being cut. The teeth of the hacksaw blade are staggered, as shown in figure, which is known as 'set of teeth.' These make the slots wider than the blade thickness, preventing the blade from jamming.

Diagram:-



- HACKSAW FRAME WITH BLADE

Frames:- In shape it looks like the English letter 'c'. On one end of these arms, a handle is fixed and on the other end, a pin is fixed. A pin each is the fixed handle and sliding screw itself in which hacksaw blade is fitted.

There are two types of Frames. They can be noted as follows:-

- Fixed Hacksaw Frame :- For making this type of Hacksaw frame, one piece flat iron strip or pipe is bent at a right angle. In these types of Hacksaw frame, only hacksaw blades of a specific size can be fixed, not of the short size or long size.
- Adjustable Hacksaw Frame :- In this type, the structure is a bit different from a Fixed frame. The frame is made in two parts. These parts can be adjusted at different distances. Therefore in this adjustable hacksaw, big and small hacksaw blades of the different standard can be used.

Blades:- On the basis of metal of the job, different types of hacksaw blades are used in a hacksaw. These are made of tungsten steel, high speed steel and they are hardened and tempered.

Types of blades are as follows:-

- Course Grade Hacksaw Blade :-  
Hacksaw Blade of this grade is used for cutting thickness of mildsteel, copper, aluminium and brass etc. It contains 14 to 18 teeth per inch.
- Fine Grade Hacksaw Blade :-  
Hacksaw Blade of this type is mainly used to cut thin pipes, sheets, tubes etc. It has 24 to 30 dents per inch.

• Medium Grade Hacksaw Blade :-

- This type of blade is used for cutting all kinds of metals such as cast iron, tool steel, aluminium, brass, high carbon steel etc. From 20 to 24 teeth per inch are cut in this Hacksaw Blade.

• Superfine Grade Hacksaw Blade :-

- For cutting extra-ordinary solid metals and thin metal sheets, thin type of Hacksaw blade is used. There are 30 to 32 dents per inch in this type of hacksaw blade.

• All Hard Blade :-

- Blades of this nature are hardened and tempered only except the ends having holes. These are used for cutting articles cast iron or mould iron etc.

• Flexible Blade :-

- In blades of this nature only the cutting teeth and nearby part is hardened and tempered.

Uses of Hacksaw are as follows:-

- It is used for cutting metal pipes, rods-brackets etc.
- Hacksaws can also cut through plastic.
- Hacksaws are also used by plumbers to cut pipes and occasionally by electricians to cut conduit.

Q3) List the Cutting Tools, Measuring and Marking tools used in fitting shop.

→ Cutting Tools Used in Fitting shop are as follows:-

- Hacksaw
- Chisels
- Combination cutting Plier
- Twist Drill
- Taps and Tap Wrenches
- Dies and Die holders
- Extractors
- Files.

Measuring Tools Used in Fitting Shop are as follows:-

- Calipers
- Vernier Calipers
- Vernier Height Gauge
- Outside Micrometer
- Inside Micrometer
- Depth Micrometer
- Feeler Gauges
- Radius Gauges
- Screw Pitch Gauges
- Drill Gauges

Marking Tools used in Fitting shop areas follows:-

- Marking Table
- Surface Plate
- Angle Plate
- Universal Scribing Block
- Try Square
- Scriber
- Combination Set
- Odd leg Caliper
- Divider
- Dot Punches

(Q4) What is the use of Files in workshops? Explain in brief Types of Files according to size, shape, grade and cut of Files.

→ Files are used for finishing purposes in the workshop by the process of filing. Filing is one of the methods of removing small amounts of material from the surface of a metal part. A file is a hardened steel, having slant parallel rows of cutting edges or teeth on its surfaces. On the faces the teeth are usually diagonal to the edges. One end of the file is shaped to fit into a wooden handle.

Files are classified according to their size, shape, cutting teeth and pitch or grade of the teeth.

Type of File are as follows:-

- Hand file :- Rectangular in section and tapered in thickness but parallel in width. The faces carry double cut teeth and one of the edges single cut. The other edge, known as safe edge, does not have any teeth and hence this file is known as safe edge. It is useful in filing a surface which

is at right angle to an already finished surface

- Flat file :- It is rectangular in section and tapered for  $\frac{1}{3}$  length in width and thickness towards the tip. The faces carry double cut teeth and the edges carry single cut teeth. It is a general purpose file.
- Square file :- It is square in section and carry double cut teeth on all the four faces. It is tapered for  $\frac{1}{3}$  of its length towards the point. Square files are used for filling corners and slots. It is also used to cut keyways.
- Three Square file :- It is of equilateral triangle in section and tapers towards the tip. The faces are double cut and the edges are sharp. The files are used to file angular hole, and recesses. It is also used for sharpening wood saws.
- Roundfile :- It is tapered for  $\frac{1}{3}$  length with double cut on large coarse grades. Used for filing out round, elliptical and curved openings.
- Half Round file :- It has one flat and one curved side. The flat side is double cut and the curved side is single cut. It is not a semicircle but only about  $\frac{1}{3}$  of circle. Second cut and smooth grades are used. This is an extremely useful double purpose file for flat surfaces and for curved surfaces which are too large for the round file to be used.
- Swiss or Needle files :- 150 mm long with double cut teeth. Used for filing corners, grooves, narrow slots etc.

(Q5) Prepare process plan for performing the fitting Job with help of points given.

→ Job Title :- To perform the fitting Job for the Job Drawing given

Material used :- One mild-steel sheet cut into piece of  $50 \times 50$  mm in dimension

Tools and Equipment :- Hacksaw, Filer, Dot punch, center punch, Steel Rule, Try-Square, bench-vise table, hammer

Operations :- Filing, Right Angle Making and Sawing

Procedure :- The following steps are followed while performing the job.

- The piece required is checked for its dimensions
- Adjacent edges are filed to straightness and are checked with 'Try-Square'
- Ink Chalk / Marker is used to mark one side and is dried for making
- Lines are marked according to the figure
- Center is marked with dot and center punch
- Excess material is cut off using saw from remaining edges.
- Finally all parts are removed by filing the surface of the job

Job Drawing :-

