

Assignment No. 1Carpentry shop.

CO2 - Develop an object using carpentry trade as per given specifications.

(Q1) What common safety measures should be taken while working in carpentry shop?

- A) • Always wear safety glasses or face shield.
- Use gloves to protect hands from splinters when handling wood but do not wear them near rotating blades and other machinery parts where the gloves can catch.
- Always wear protective footwear.
- Wear hearing protection that is suitable for the level of frequency of the noise you are exposed to in the shop. If you have trouble hearing someone speak from three feet away, the noise level from the machine is too high.
- Make sure the guard in position is in working condition. Check and adjust all other safety devices.
- Inspect stock for nails or other material before cutting, planing, routing, or carrying out similar activities.
- Ensure that all cutting tools and blades are clean, sharp and in good working order so that they will cut freely, not forced.
- Turn the power off and unplug the power cord before inspecting, changing, cleaning, adjusting a blade or machine. Also turn the power off when discussing the work.

(Q2) Which type of wood is mostly used for furniture work? why?

- a) (i) Teak Wood is one of the most commonly used wood types, available locally. Its scientific name is 'Tectona Grandis'.

Some manufacturers import teak wood from Burma and Ghana. In India, Kerala is one of the biggest suppliers of teak wood. It is strong and very durable and is often used for building door frames, cabinets, and tables. Teak wood is resistant to decay and can outlast all other types of wood. Since it is a hard wood, it can also withstand extreme heat and cold and therefore, it is also used for creating outdoor furniture.

- (ii) Rose Wood is also known as Sheesham. It is also a hard wood and can be used with different polishes and finishes. Although Rosewood is the most expensive wood in India, it is mostly preferred due to its termite-resistant quality, durability and versatility. Rosewood can be used for making kitchen cabinets, sofas and even wooden flooring due to its attractive wood grain. Sheesham is also used in musical instruments and is largely found in south India. Its scientific name is '*Dalbergia latifolia*'.
- (iii) '*Chloroxylon swietenia*' commonly called Satin Wood is an affordable material and is supplied from central and southern Indian states. Satin wood is usually low maintenance. It is hard and durable and can be given the desired look or finish by using different types of polish. Satin Wood usually has a very lustrous look, since its grain is varied. Usually, satin wood furniture is bright yellow-coloured and in warm shades.
- (iv) Sal Wood is considered one of the most high-quality grades of wood, used for furniture and construction purposes. Sal wood is a type of timber, which does not require layers of polish to protect its durability. It has an ability to withstand water and underground damp conditions. Sal wood furniture is immune to decay and usually used for manufacturing door frames, staircases and beams. Sal wood is called '*Shorea Robusta*' and is found in UP, Karnataka & Andhra Pradesh.

v) Sisso wood is scientifically called '*Dalbergia sissoo*'.

Advantages:

Used for:

- Strong & Grained
- Good finish
- Highly attractive
- decorative pieces of furniture
- sports goods.

(vi) Mavandi wood, also known as white cedar wood. scientific name is '*Melia Azederach*'. It is mostly imported from malaysia and it requires month-long seasoning, before it becomes ready for use. It is a type of soft.

Advantages:

- Requires minimal maintenance, decay resistant.
- Affordable, look great and is effective in terms of strength
- Used for making shoe rack, chests, trunks and interior parts of sofa and dining chairs, which are later covered with upholstery.

(vii) Mahogany, scientific name '*Swietenia Macrophylla*'.

Advantages:

Used for:

- Glossy finish
- Durable
- Cabinets
- Attractive deer

(viii) Mulberry wood is scientifically called '*Morus Alba*'.

Advantages:

Used for:

- Brilliant finish
- Easily learable
- Fence posts
- Study tables etc.

(ix) Deodar, also known as '*Cedrus Deodara*'.

Advantages:

Used for:

- Rot resistant and highly durable
- Absorbs polish to a high degree
- swings, cabinets
- carriages etc.

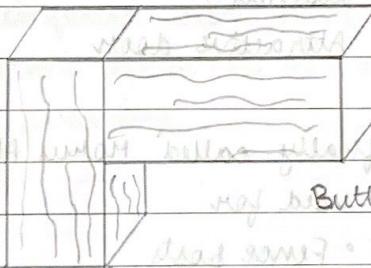
(x) Jackfruit called '*Artocarpus Heterophyllous*' is easy to work with because of its even grain. It has an aesthetic appeal and is used to make door panels.

(Q3) What is the specific use of wood-turning lathe?

A) Wood turning lathes are typically used to shape wood into cylindrical profiles. Objects made on a wood lathe include such items as bowls, furniture legs, lamp posts, baseball bats and other ornaments. Wood lathe tooling consists of fixtures and securing devices for the work piece, a moveable tool rest, and hand-held cutting tools in the form of long handled gouges, skew, scrapers, and parting tools. Specialty tooling is also available for internal shaping and surface development. However, the wood lathe is still used for decentralized production of limited or custom turnings.

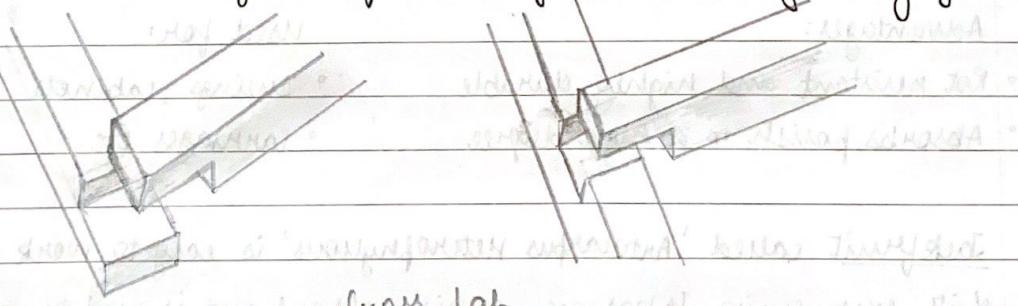
(Q4) With the help of sketches explain different joints used in woodworking.

A)(i) Butt joint: The end piece of wood is butted against another piece of wood. This is the simplest and weakest joint. Different types of butt joints are: a) T-butt, b) end-to-end butt, c) Miter butt and d) edge-to-edge butt.



Butt Joint.

(ii) Lap joint: The end of a piece of wood is laid over and connected to another piece of wood. Due to large surface area of long-grain to long-grain wood and glue surface coverage, this is a very strong joint.

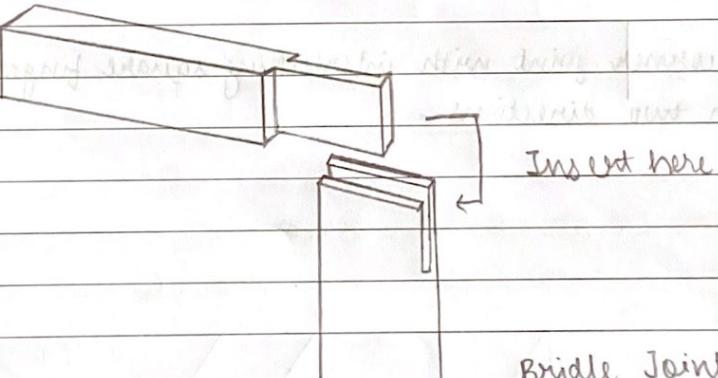




Mitered half lap

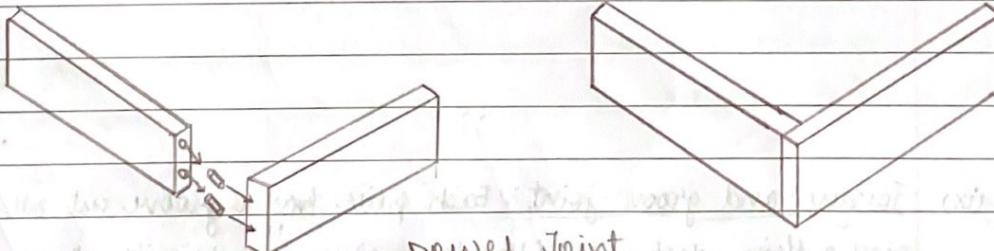
Dovetail Crossed Lap

- (iii) Bridle joint: Also known as open tenon, open mortise and tenon, or tongue and fork joints, this joint is where the through mortise is open on one side and forms a fork shape. The mate has a through tenon or necked joint. Bridle joints are commonly used to join rafter tops, also used in scarf joints and sometimes sill corner joints in timber framing.



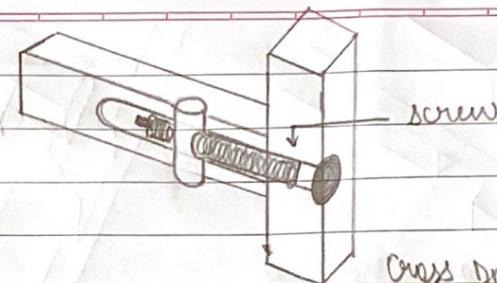
Bridle Joint

- (iv) Dowel joint: The end piece of wood is butted against another piece of wood. This is reinforced with dowel pins. This joint is quick to make with production line machinery and so is a very common joint in factory made furniture.



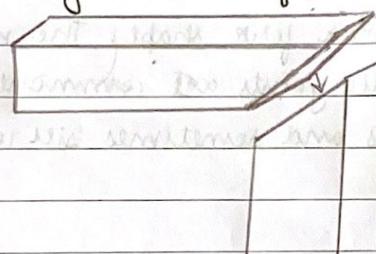
Dowel Joint

- (v) Cross dowel joint: A threaded metal dowel is inserted into a drilled slot. A screw is then inserted through an opening slot and tightened to create a pull effect. This joint is also very common in factor-made.



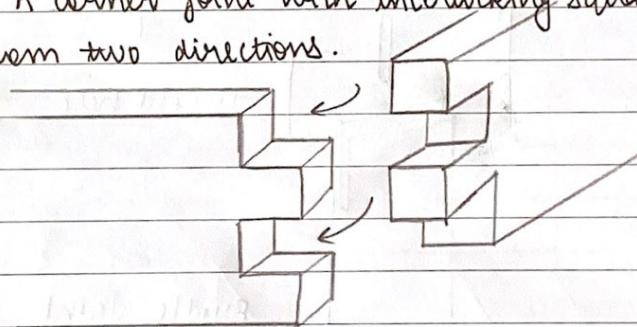
Cross Dowel Joint.

- (vi) Mitre joint: Similar to a butt joint, but both pieces have been beveled (usually at a 45° angle)



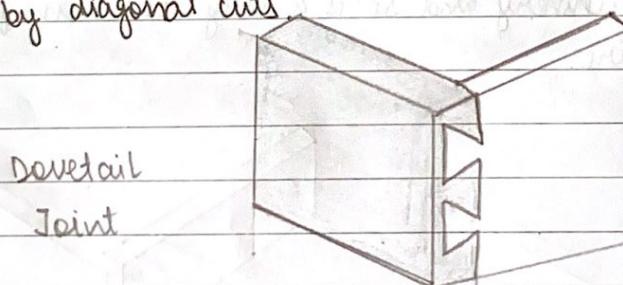
Mitre Joint.

- (vii) Biscuit joint: A corner joint with interlocking square fingers. Receives pressure from two directions.

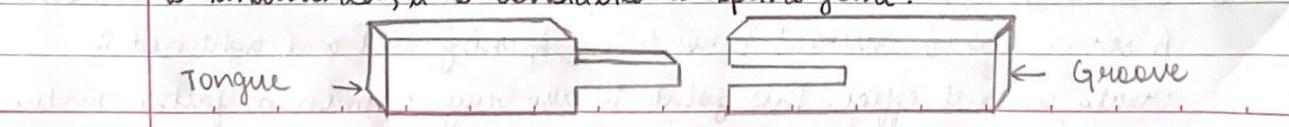


Biscuit Joint

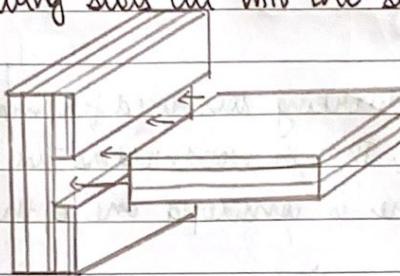
- (viii) Dovetail joint: A form of biscuit joint where the fingers are locked by diagonal cuts.



- (ix) Tongue and groove joint: Each piece has a groove cut all along one edge and a thin, deep ridge (the tongue) on the opposite edge. If the tongue is unattached, it is considered a spline joint.

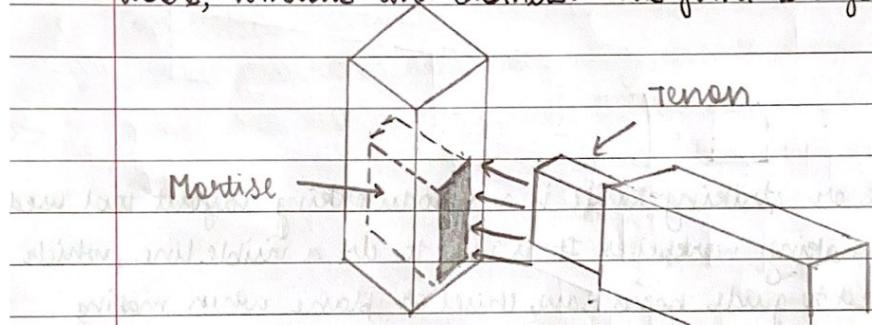


(x) Dado joint: Also called a housing joint or trench joint, a slot is cut across the grain in one piece for another piece to sit in; shelves on a bookshelf having slots cut into the sides of the shelf, for example.

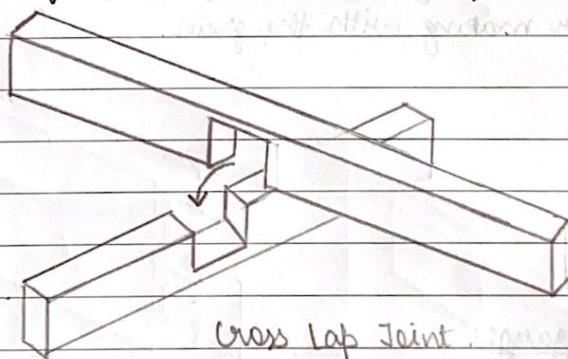


Dado Joint

(xi) Mortise and Tenon joint: A stub (the tenon) will fit tightly into a hole cut for it (the mortise). This is a hallmark of Mission Style Furniture, and also the traditional method of jointing frame and panel members in doors, windows and cabinets. This joint is a good strong joint to use.

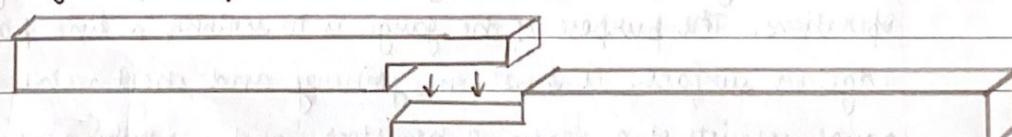


(xii) Cross Lap joint: A joint in which the two members are joined by removing material from each at the point of intersection so that they overlap.



Cross Lap Joint

(xiii) Splice joint: Joint used to attach two members end to end. They are of three types: a) Half lap splice, b) Bivel lap splice and, c) Tabled splice joint.



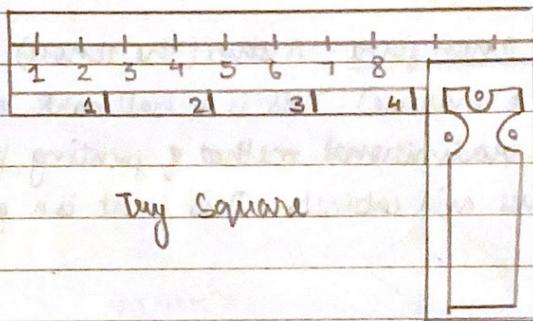
Half Lap Splice

(Q5) Briefly explain with neat sketch following carpentry tools:

T try square, Marking knife, Marking gauge, Carpenter saw.

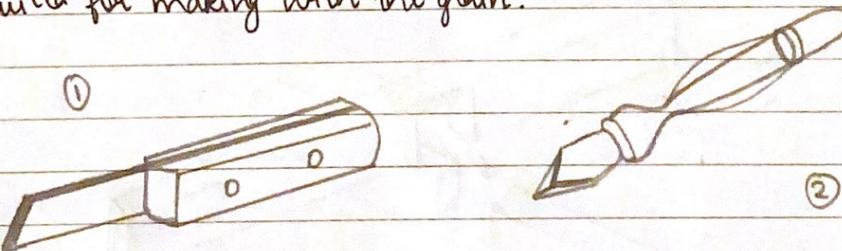
A) i) Try square:

A try square is a woodworking tool used for making and checking 90° angles on pieces of wood. Though woodworkers use many different types of squares, the try square is considered one of the essential tools for woodworking.



ii) Marking Knife:

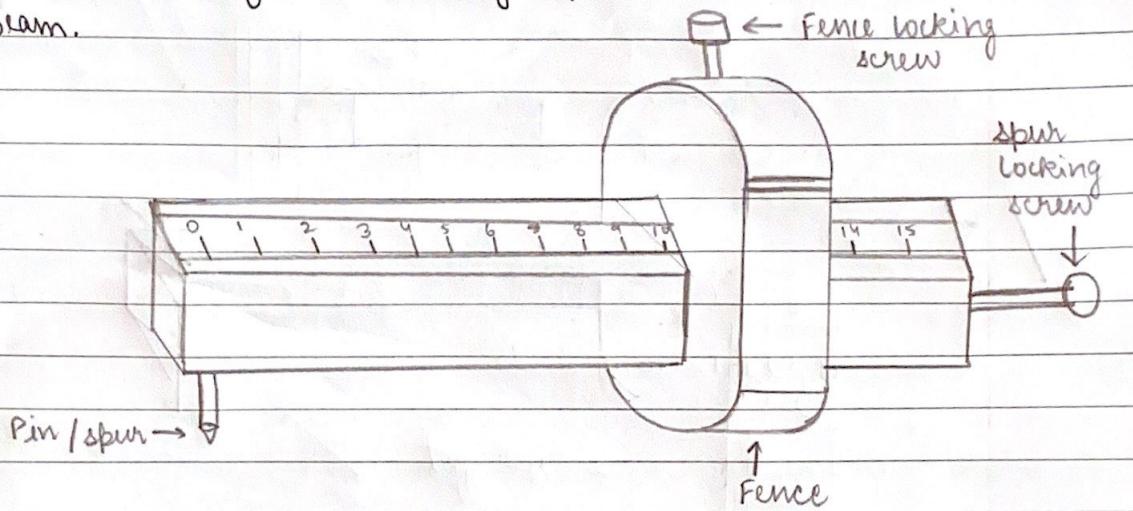
A marking knife or striking knife is a woodworking layout tool used for accurately marking workpieces. It is used to cut a visible line, which can then be used to guide hand saw, chisel or plane when making woodworking joints and other operations. They are generally used when marking across the grain of wood, with scratch awls better suited for marking with the grain.



iii) Marking gauge:

A marking gauge, also known as a scratch gauge, is used in woodworking and metalworking to mark out lines for cutting or other operations. The purpose of the gauge is to scribe a line parallel to a ref. edge or surface. It is used in joinery and sheetmetal operations. The gauge consists of a beam, a headstock, and a scribing or marking implement.

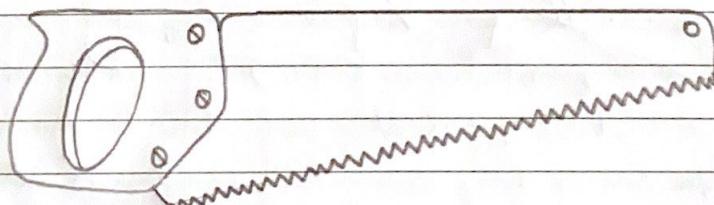
typically a pin, knife, pen or wheel. The headstock slides along the beam, and is locked in place by various means: a locking screw, cam lever, or a wedge. This marking implement is fixed to one end of the beam.



Marking Gauge

iv) Carpenter saw:

In woodworking and carpentry, hand saws, also known as "panel saws", are used to cut pieces of wood into different shapes. This is usually done in order to join the pieces together and create a wooden object. They usually operate by having a series of sharp points of some substance that is harder than the wood being cut. The hand saw is a bit like a tenon saw, but with one flat, sharp edge.



Carpenter saw.

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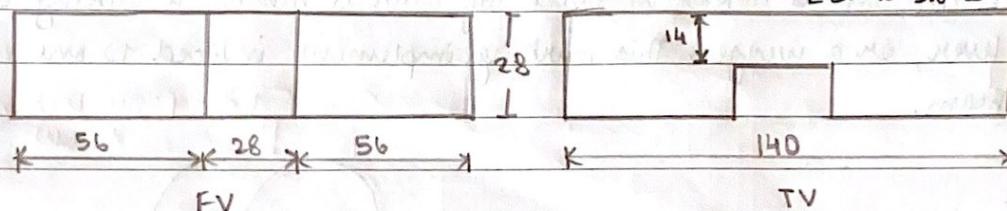
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Q6)

For the given carpentry job drawing write the process plan.

[Dimensions in mm]

Plan:

Operation Number	Operation Description	Machine / Tools used	Testing	Measuring Instrument
10.	Visual inspection of bar stock for dimensions and defects.	View Bench	-	Meter scale
20.	Cut the bar stock to length 143 mm and width 30 mm.	Power hacksaw M/C	Hacksaw blade 8 TPI	Meter scale
30.	File the bar to length 140mm			
30.1	Using steel rule, file the bar such that it is 28mm in thickness.			
30.2	Mark 14mm each from the middle point of one side. (i.e. 28mm total)	Centre, Hacksaw, Lathe	Filer, Chisel,	Steel rule
30.3	Using a hack saw cut 14mm deep from the marking side		Hammer,	
30.4	Remove the middle part using chisel and hammer.		Marking knife.	
30.5	File the gap to make it smoother			
30.6	Take another bar stock and repeat the process.			
30.7	Fit both the pieces using a hammer.			
40.	Remove burr all over	Polishing machine	Emery paper	
50.	Final inspection and dispatch	View Bench	-	Steel rule