

**Practice questions on Carpentry and Fitting**  
**One sentence answer type**

1. Write two problems that are caused by moisture in the wood.

Ans: Shrinkage, Wapage, Distortion

2. Identify odd one out amongst Rasp, File, Chisel, Saw-set

Ans: Saw-set

3. Identify the tool shown in the figure.



Ans: Jack plane

4. In which shop scarper tool is used?

Ans: Fitting Shop

5. Explain the use of bow saw.

Ans: The bow saw is used for cutting logs, living branches, or treated wood. Portable bow saws can be used to cut small and medium-sized logs for fire or shelter.

6. Identify the tool shown in the figure.



Ans: Claw Hammer

7. What do you mean by a mortise?

Ans: It is a rectangular deep hole to receive a tenon.

8. What is the purpose of a marking gauge?

Ans: It is used to mark a parallel line with respect to an edge.

9. For which purpose the Mortise chisel is used?

Ans: To fabricate mortise (rectangular deep hole).

10. For which purpose the marking gauge is used?

Ans: To mark a parallel line with respect to an edge.

11. Which planning tool is used in carpentry shop?

Ans: Jack plane

### **Brief answer type questions**

Q.1: Explain how the rotary motion in a bench vise is converted to linear motion?

Answer: Rotary motion is converted to linear motion with the help of a power **screw**. The power square has square threads. Helical threads in the screw are constrained to move in a helical path in the nut, thus advancing the screw during rotation. (Full marks for just mentioning about screw.)

Q.2: What do you mean by a center punch in a fitting shop?

Answer: Center punch is used for making a mark in the job. It has a pointed end (point angle  $60^\circ$  or  $90^\circ$ ). The mark is made by hitting the other end by a hammer. (Full marks for first sentence only.)

Q.3: What is the purpose of setting of a saw?

Answer: The points of teeth are bent to cut a wide groove and provide clearance. This bending of teeth to the sides is called the setting of the saw. It is needed so that the blade does not get jammed. (Keywords provide clearance, avoid jam are enough.)

Q.4: A hacksaw blade has 16 teeth per 25 mm. Find out the pitch of the teeth.

Answer: Pitch =  $25/16 = 1.56$  mm (approximately 1.6 mm is also correct).

Q.5: What is the density of steel in  $\text{kg/m}^3$ ?

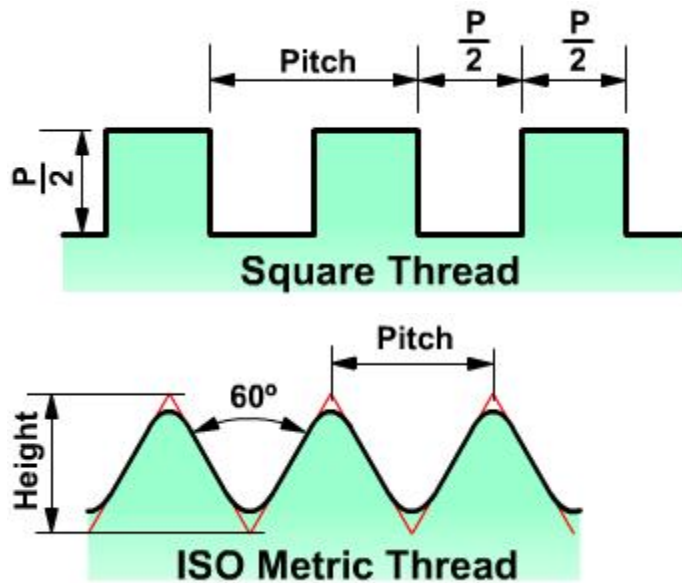
Answer:  $7700 \text{ kg/m}^3$  (Any answer between 7400 to 8000 should get full marks). It is about 12-13 times heavier than soft wood.

Q.6: Explain the main difference between a bastard and smooth file.

Answer: Bastard file has larger tooth spacing compared to smooth file. It is used for rough filing, whilst smooth file is for finishing operation.

Q.7: With a simple sketch, explain the difference between V and square threads.

Answer: A V thread has screw angle of  $60^\circ$ , whilst square thread is of square profile.



V thread

Q.8: With the help of a sketch, explain the concept of draw filing.

Answer:

## DRAW-FILING



Figure 47.—Draw filing.

<sup>14</sup> In draw filing both the hands are put close together on the blade. The file is placed at right angles across the work, while the hands, especially the thumbs, grip the file and move it up and down the length of the job. Smoother cutting action is achieved.

Q.9: What is the purpose of a surface plate in the fitting shop?

Answer: It is used for testing the flatness and also for marking-out work.

Q.10: By using which tool, you can cut external threads in fitting shop by hand?

Answer: Die. Die is held in die-stock.

Q.11: What is the purpose of a claw in a claw hammer?

Answer: It is used for pulling out nails.

Q.12: For what purpose trammel points are used in a carpentry shop?

Answer: **Trammels** or **trammel points** are the sockets or cursors that, together with the beam, make up a beam compass. It is a marking tool. (Full marks for just writing the last sentence.)

Q.13: Why do we use bradawl in a carpentry shop?

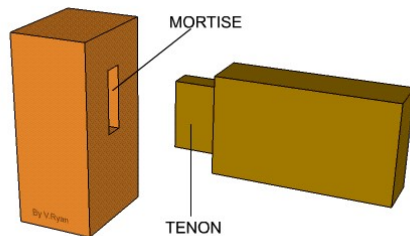
Answer: Bradawl is used to bore small hole in wood by hand.

Q.14: Explain the difference between hammer and mallet.

Answer: Mallet is rubber or wooden-headed hammer of round or rectangular cross-section. It is used for giving light blows to cutting tool. Hammer is made of steel.

Q.15: With the help of a sketch, explain the difference between a mortise and tenon.

Answer: Rectangular peg is called tenon and rectangular hole is called mortise.



Q.16: What is the purpose of pincer in carpentry shop?

Answer: It is used for pulling out nails, tacks etc.

Q.17: Explain the use of a bow saw?

Answer: It is used for cutting quick curves. As the handles revolve in sockets, the blades can be adjusted to cut any desired position. (One sentence answer is good enough.)

Q.18: Explain the difference between gauge and gouge.

Answer: A gauge is used to mark lines parallel to the edge of a piece of wood. A gouge is a chisel with curved cross-section and may be either inside or outside ground.

Q.19: Explain the difference between rasp and file.

Answer: **Rasps** are **files** made specifically for wood. Their coarse, individual teeth, punched up from the steel surface, are perfect for grating away at lumber.

Q.20: For what purpose lathe is used in carpentry shop.

Answer: Lathe is used for cutting a shape in wood that is symmetrical around the axis of rotation.

### Some other one-line answer questions

1. Name any two marking tools used in the fitting shop.

Ans: Punch, scribe, surface plate, try square, height gauge, etc.

2. What is the percentage of carbon in Mild Steel?

Ans: 0.3%

3. Which material is used to manufacture the following tools?

(a) Surface plate

(b) The blade used in Hacksaw

Ans: Surface plate: cast iron

Blade in hacksaw: high carbon steel

4. Name the type of files with the cross-section as shown in the figures below?



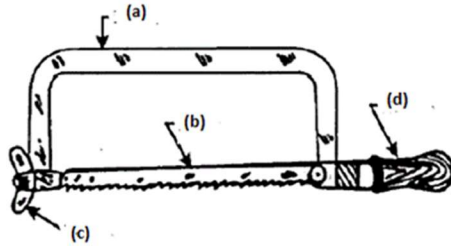
(a)



(b)

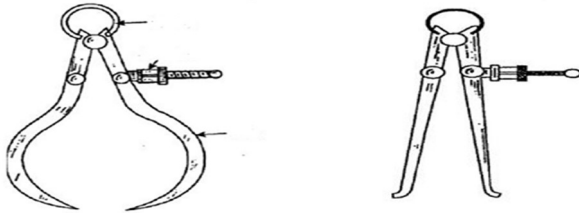
Ans: (a) flat file, (b) Diamond file

5. Name all the indicated parts in the following diagram?



Ans: (a) Frame, (b) blade, (c) fly nut and (d) handle

6. Using the calipers given below, what you can measure?



(a) (b)

Ans: (a) outer diameter and (b) inside diameter

7. What do you mean by least count of a measuring tool?

Ans: Minimum dimension that can be expressed/measured by the measuring tool.

8. What is the use of Dot punch?

Ans: For marking dotted line.

9. What is the use of center punch?

Ans: To mark the center of a hole before drilling

#### **A note about Cast iron from Wikipedia**

“**Cast iron** is a group of [iron-carbon alloys](#) with a carbon content more than 2%.<sup>[1]</sup> Its usefulness derives from its relatively low melting temperature. The alloy constituents affect its colour when fractured: white cast iron has [carbide](#) impurities which allow cracks to pass straight through, [grey cast iron](#) has graphite flakes which deflect a passing crack and initiate countless new cracks as the material breaks, and [ductile cast iron](#) has spherical graphite "nodules" which stop the crack from further progressing.

Carbon (C) ranging from 1.8 to 4 wt%, and [silicon](#) (Si) 1–3 wt%, are the main alloying elements of cast iron. Iron alloys with lower carbon content are known as [steel](#).”

#### **A note about steel from Wikipedia**

**Steel** is an [alloy](#) of [iron](#) with typically a few percent of [carbon](#) to improve its [strength](#) and [fracture resistance](#) compared to iron. Many other elements may be present or added. Stainless steels that are [corrosion](#)- and oxidation-resistant need typically an additional 11% [chromium](#). Because of its high [tensile strength](#) and low cost, steel is used in [buildings](#), [infrastructure](#), [tools](#), [ships](#), [trains](#), [cars](#), [machines](#), [electrical appliances](#), and [weapons](#). Iron is the [base metal](#) of steel and it can take on two crystalline forms (allotropic forms): [body-centred cubic and face-centred cubic](#). These forms depend on temperature. In the body-centred cubic arrangement, there is an iron atom in the centre and eight atoms at the vertices of each cubic unit cell; in the face-centred cubic, there is one atom at the centre of each of the six faces of the cubic unit cell and eight atoms at its vertices. It is the interaction of the [allotropes of iron](#) with the alloying elements, primarily carbon, that gives steel and [cast iron](#) their range of unique properties.

In pure iron, the [crystal structure](#) has relatively little resistance to the iron atoms slipping past one another, and so pure iron is quite [ductile](#), or soft and easily formed. In steel, small amounts

of carbon, other elements, and inclusions within the iron act as hardening agents that prevent the movement of [dislocations](#).

The carbon in typical steel alloys may contribute up to 2.14% of its weight<sup>[citation needed]</sup>. Varying the amount of carbon and many other alloying elements, as well as controlling their chemical and physical makeup in the final steel (either as solute elements, or as precipitated phases), slows the movement of those dislocations that make pure iron ductile, and thus controls and enhances its qualities. These qualities include the [hardness](#), [quenching behaviour](#), need for [annealing](#), [tempering behaviour](#), [yield strength](#), and [tensile strength](#) of the resulting steel. The increase in steel's strength compared to pure iron is possible only by reducing iron's ductility.

Mild steel (iron containing a small percentage of carbon, strong and tough but not readily tempered), also known as plain-carbon steel and low-carbon steel, is now the most common form of steel because its price is relatively low while it provides material properties that are acceptable for many applications. Mild steel contains approximately 0.05–0.30% carbon<sup>[1]</sup> making it malleable and ductile. Mild steel has a relatively low tensile strength, but it is cheap and easy to form; surface hardness can be increased through [carburizing](#).<sup>[3]</sup>

#### Some Definitions

**Bevel square:** a woodworker's square with an adjustable arm that can be set to mark out an angle or to check the slope of a surface.

**Trammel:** Trammels are used to measure distance between two points that are too great to be reached with dividers.

**Wing Compass:** a carpenter's compass having a metal arc and binding screw for setting at the desired degree of opening.

A ***gimlet*** is a hand ***tool*** for drilling small holes, mainly in wood, without splitting.

A router is a hand tool or power tool that routs (hollows out) an area in hard material, such as wood or plastic.

**Gauge:** an instrument that measures and gives a visual display of the amount, level, or contents of something.