A Laboratory Manual for

Mechanical Working Drawing (22341)

Semester- III

Diploma in Mechanical Engineering Group (ME)

Certificate

This is to certify that, Mr./ Ms. _____

Roll No. …… of third Semester of Diploma in Mechanical Engineering of _____

_____ (Inst.code:_____) has satisfactorily completed the term work in the subject Mechanical Working Drawing (22341) for the academic year 20…. to 20…. as prescribed in the MSBTE curriculum.

Place: …….. **Enrollment No. : ……**

Date:…… **Exam. Seat No. : ……**

Sign:

Name:

Subject Teacher **Head of the Department** **Principal**

Seal of Institution

List of experiments and progressive assessment for term work (TW) D-3

Academic Year: 20 -20 **Name of Faculty:**

Course code: MI3G **Subject Code:** MWD (22341)

Name of candidate: **Enroll no.** **Roll no.**

Semester: III **Marks:** Max : Min :

Sr. No.	Title	Date of performance	Date of submission	Marks	Sign of teacher
1	DEVELOPMENT OF SURFACES				
2	INTERSECTION OF SOLIDS				
3	CONVENTIONAL REPRESENTATIONS				
4	PRODUCTION DRAWING				
5	DETAILS TO ASSEMBLY				
6	ASSEMBLY TO DETAILS				
Total marks out of ( )					
Marks out of (50)					

TOPIC -1 DEVELOPMENT OF SURFACES

SQUARE PRISM

1.A square prism of base side 40 mm and height 80 mm rests on HP with all faces equally inclined to VP. It is cut by a plane perpendicular to VP and 60° inclined to HP passing through a point on axis 55 mm from base. Draw development of lateral surface of the prism.

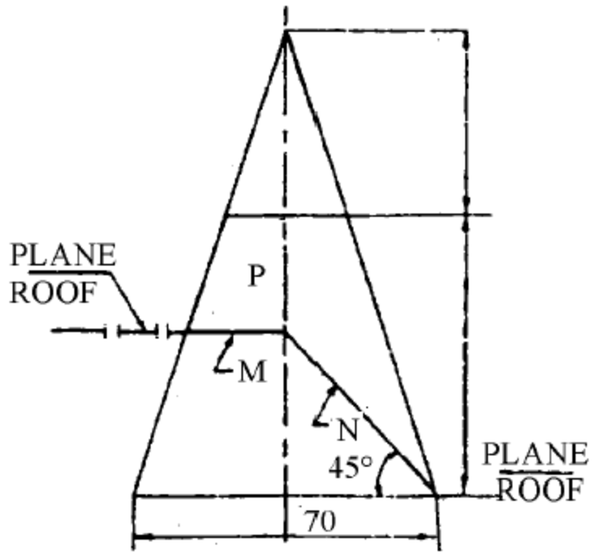
Figure 1.

Mechanical Working Drawing (22341)

TOPIC -1 DEVELOPMENT OF SURFACES

(PYRAMID)

2. A chimney in the form of a frustum of a square pyramid. It is attached over a plane roof as indicated by the front view shown in figure 4. Draw the given front view, top view, and the lateral surface development of the portion P.



F.V.

TOPIC -1 DEVELOPMENT OF SURFACES

(CONE)

3. A cone of base diameter 60 mm and 70 mm long axis rests on HP on its base. It is cut by a section plane perpendicular to VP and inclined 45° to HP passing from a point on axis 35 mm from apex. Draw development of lateral surface of cone.

Figure 2

Mechanical Working Drawing (22341)

TOPIC -2 INTERSECTIONS OF SOLIDS

1. A vertical square prism, base 60mm side is completely penetrated by a horizontal square prism, base 40mm side so that their axes are 8mm apart. The axis of the horizontal prism isparallel to VP. While the faces of both prisms are equally inclined to VP.Draw the projections showing lines of intersection.

2. A vertical square prism base 60mm side and axis height 105mm has a rear rectangular face inclined at 30degree to VP. It is completely penetrated by a horizontal square prism of 45mm edge of base and 105mm long, faces of which are equally inclined to HP. Axis of two prisms are parallel to VP and bisect each other at right angles. Draw the projections of solids showing lines of intersection.

3. A pentagonal prism side of base 60mm and height 100 mm long is lying on the HP on its pentagonal base, such that and edge of base is parallel to VP. And nearer to it. The axis of the prism is parallel to VP. And perpendicular to HP. This prism is completely penetrated by a horizontal cylinder of base diameter 70mm and length 120mm such that the axis of both the prism and the cylinder bisect each other at right angle. Draw the projection of solids showing the curves of intersection.

4. A vertical square prism of 50mm edge of the base and 100mm axis is resting on its base on the HP in such a way that one of the edges of the base makes an angle of 30 degree with the VP. The prism is completely penetrated by a cylinder with axis parallel to HP and VP. The diameter of the cylinder is 60mm and axis is 15mm infront of the axis of the prism and is 50mm away from the HP.Draw three views of the arrangement showing the curves of intersection.

5. A vertical cylinder of 75mm diameter is completely penetrated by another cylinder of 50mm diameter, the axis of which is parallel to both the HP and VP. The two axes are 9mm apart. Draw the projections of two cylinders showing curves of intersection assume suitable lengths for both the cylinders.

6. A vertical cylinder of 60mm diameter is completely penetrated by another cylinder of the same size the axis of penetrating cylinder is parallel to both the HP and VP and is 10mm away from the axis of the vertical cylinder. Draw the projections of two cylinders showing curves of intersection. Assume the length of vertical cylinder as 90mm and horizontal cylinder with length of 100mm.

7. A cone with base diameter 70mm and axis height 65mm is kept on the HP on its base. It is completely penetrated by the horizontal cylinder of diameter 35mm with its axis parallel to VP and intersecting the axis of the cone at a distance of 20mm above the base of the cone. Draw the projections of solids showing curves of intersection by cutting plane method.

8. A cone with base diameter 70mm and axis height 65mm is kept on the HP on its base. It is completely penetrated by the horizontal cylinder of diameter 35mm with its axis parallel to VP and intersecting the axis of the cone at a distance of 20mm above the base of the cone. Draw the projections of solids showing curves of intersection by line method.

TOPIC -3 CONVENTIONAL REPRESENTATIONS

1. Introduction to standard convention using SP-46.

2. Draw conventional representation of various materials.

3. Draw conventional representation of Long and short Break in Pipe, rod and shaft.

4. Draw conventional representation of ball and roller bearing, pipe joints, cocks, valves, internal and external threads.

5. Draw conventional representation of all types of sections.

6. Draw conventional representation of knurling, serrated shafts, splined shafts and keys and keyways.

7. Draw conventional representation of spring with square and flat ends, gears, sprocket wheels.

8. Draw conventional representation of countersunk and counter bored Holes, tapers.

TOPIC -4 PRODUCTION DRAWING

1. Write the definitions of terminologies used in limits and fits.

2. Define Allowance, Clearance, Interference and Deviation.

3. Problems related to maximum and minimum allowances.

4. What is fit and its classification?

5. Problems related to the calculation of type of fit?

6. List out the number of symbols used in geometrical characteristics control.

7. Draw conventional representation of general welding symbols.

8. Problems related to the welded parts.

9. Write different characteristics of surface roughness.

10. Write down the indication of machining symbols with all parameters.

CHAPTER -5 DETAILS TO ASSEMBLY DRAWING

1. Figure 5. Shows the details of universal coupling. Draw the following views of the assembly. (a) front view sectional (b) top view outside (c) prepare bill of material

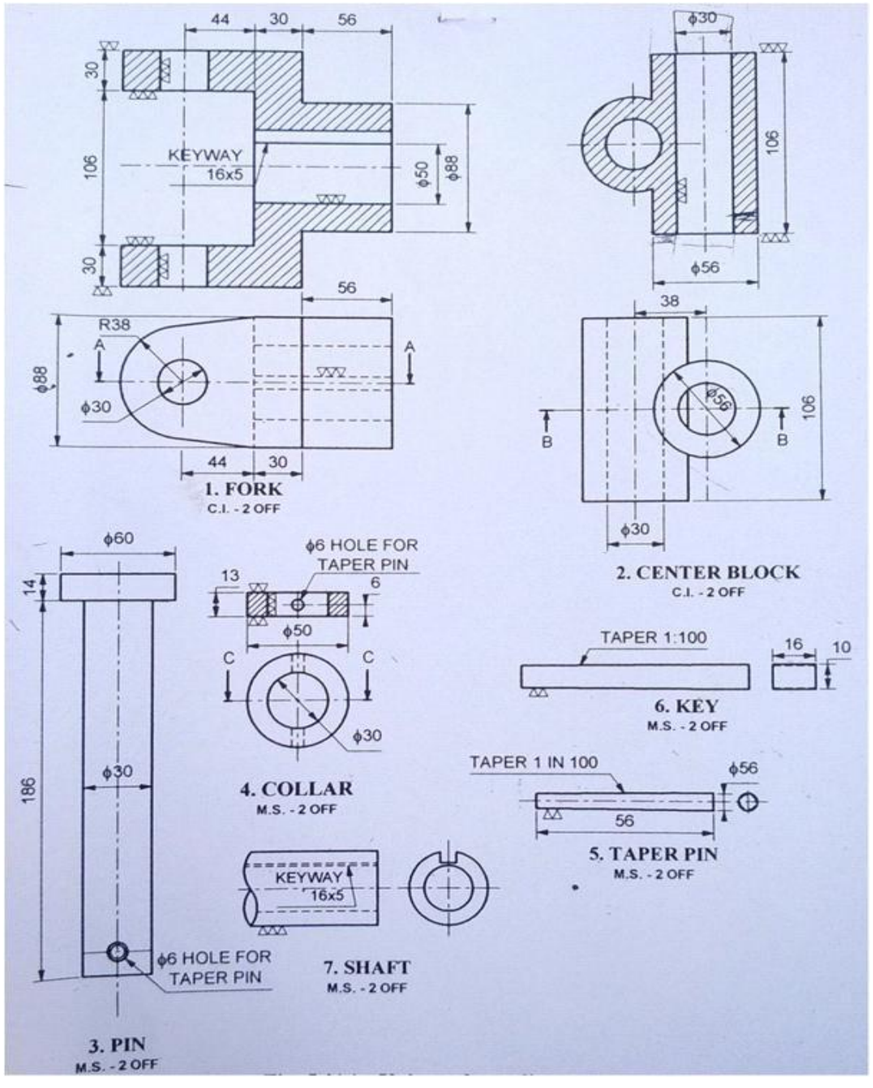


Figure 5.

Mechanical Working Drawing (22341)

2. Figure 6. Shows the details of pedestal bearing plumber block. Draw the following views of the assembly. a) front view sectional b) top view outside c) prepare bill of material

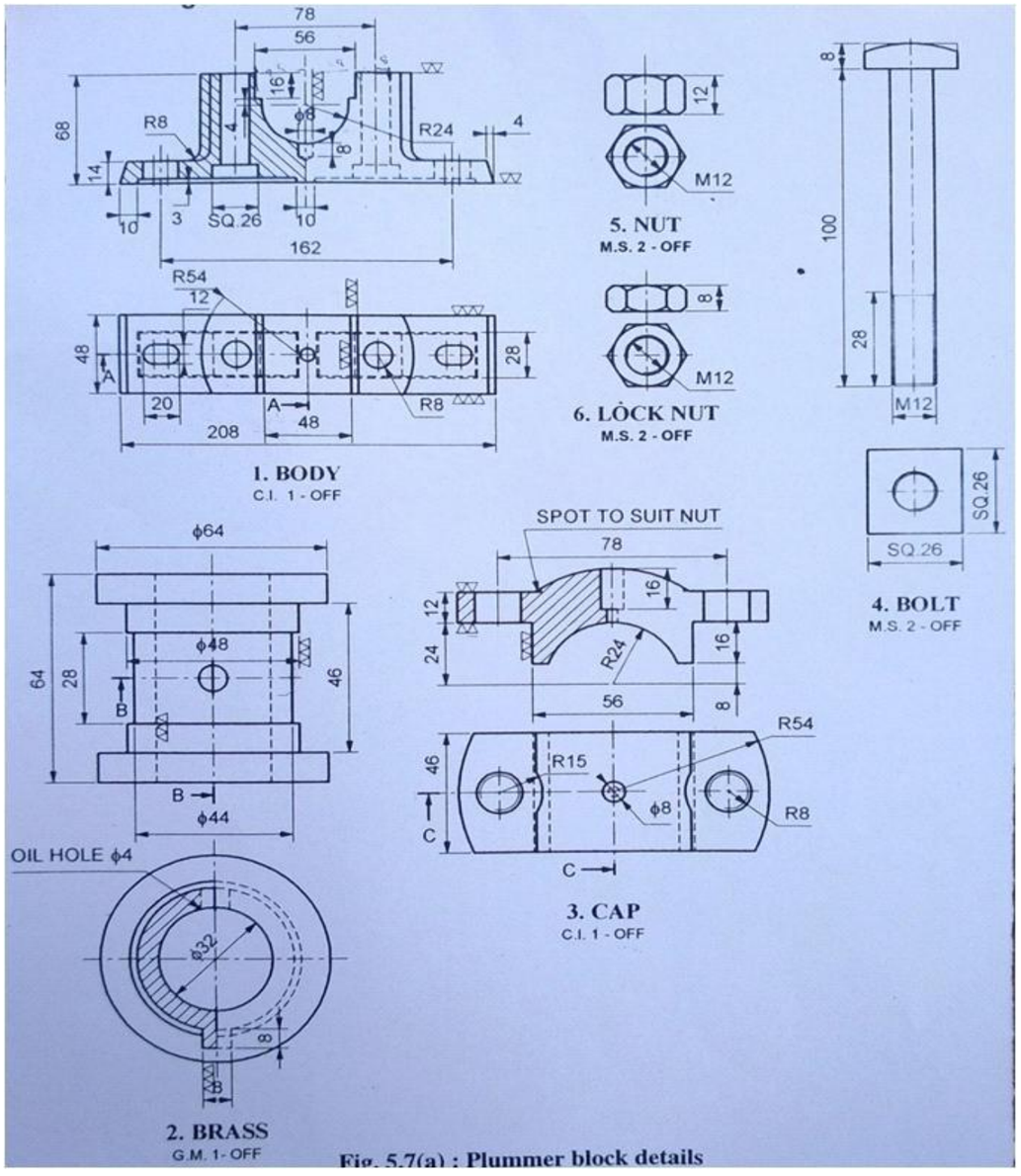


Figure 6

Mechanical Working Drawing (22341)

3. Figure 7. Shows the details of machine vice. Draw the following views of the assembly. (a) front view sectional (b) top view outside (c) prepare bill of material

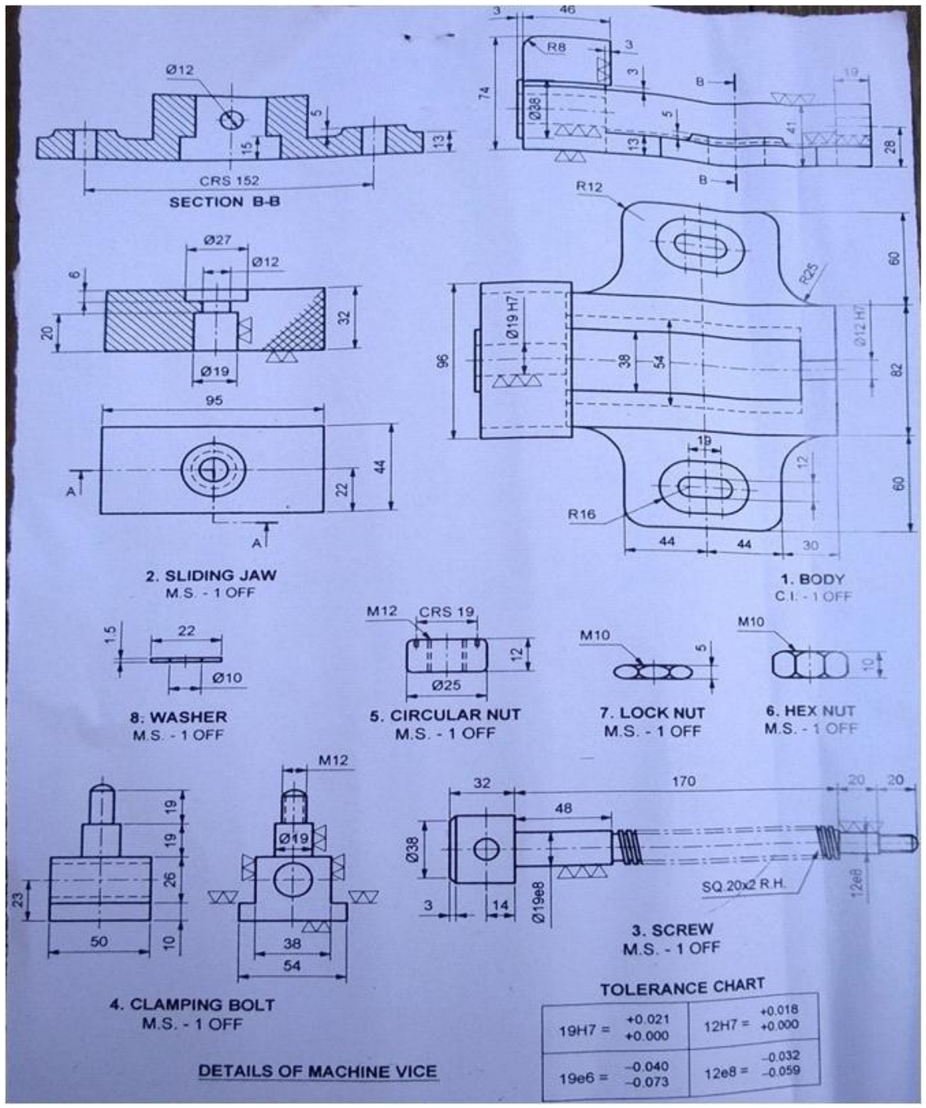


Figure 7

4. Figure 8. Shows the details screw jack. Draw the following views of the assembly. (a) front view sectional (b) top view outside (c) prepare bill of material.

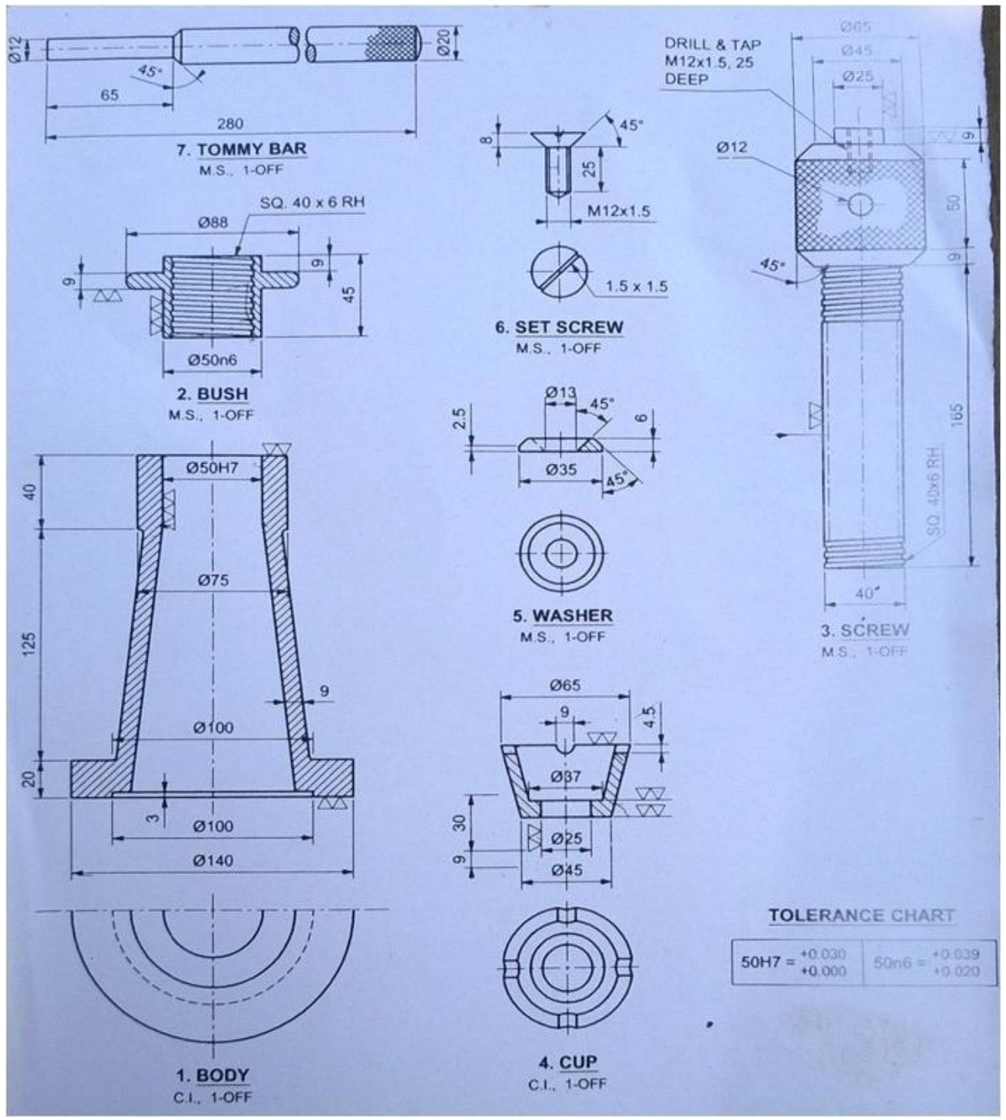


Figure 8

Mechanical Working Drawing (22341)

CHAPTER -6 ASSEMBLY DRAWING TO DETAILS OF THE ASSEMBLY DRAWING

1. Figure 9. Shows the assembly of the tail stock. Draw the following details:

(a) Body sectional FV.

(b) barrel.

(c) hand wheel (two views).

(d) spindle bearing (two views)

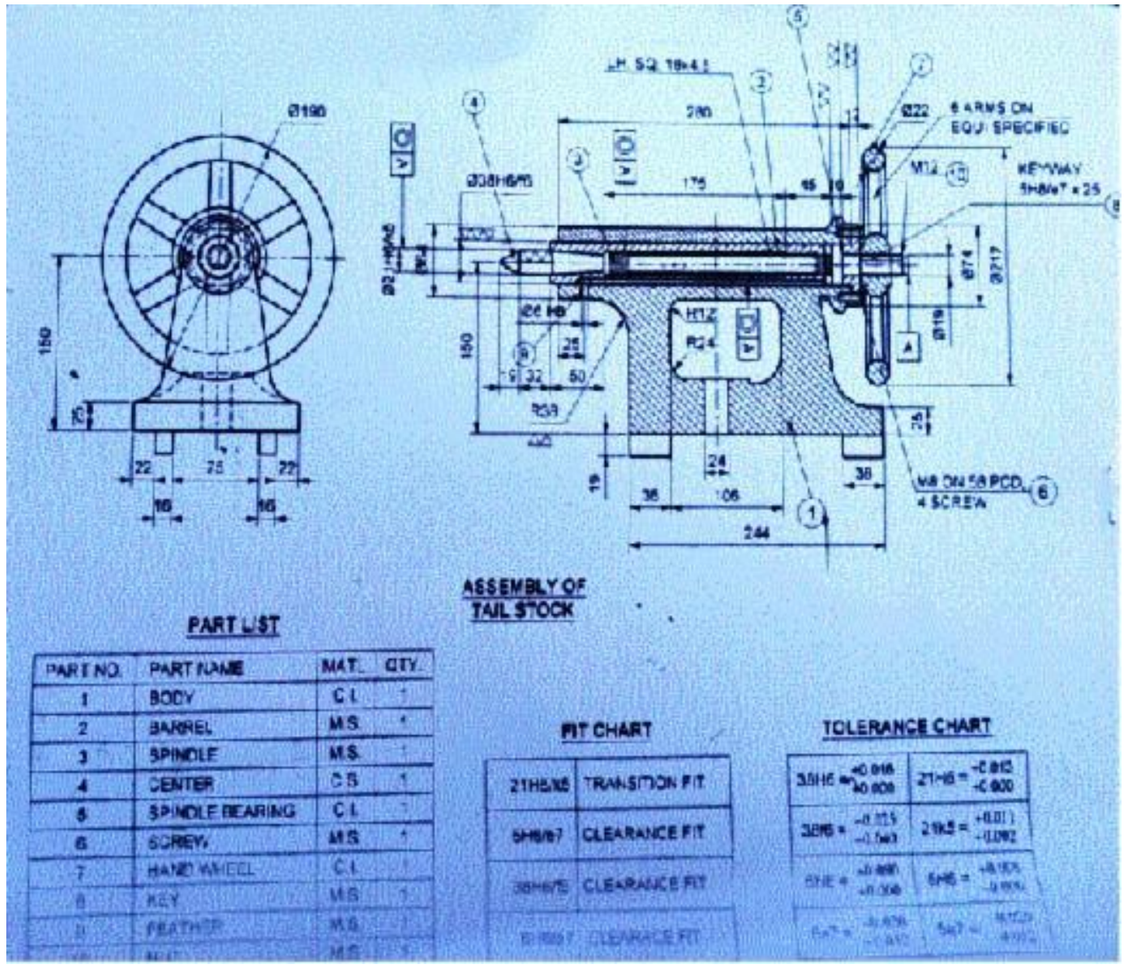


Figure 9.

2. Figure 10. Shows the assembly of drilling jig. Draw the following details:

(a) Body sectional FV (two views). (b) Component (two views).

(c)plate. (d)Also show type of fit used.

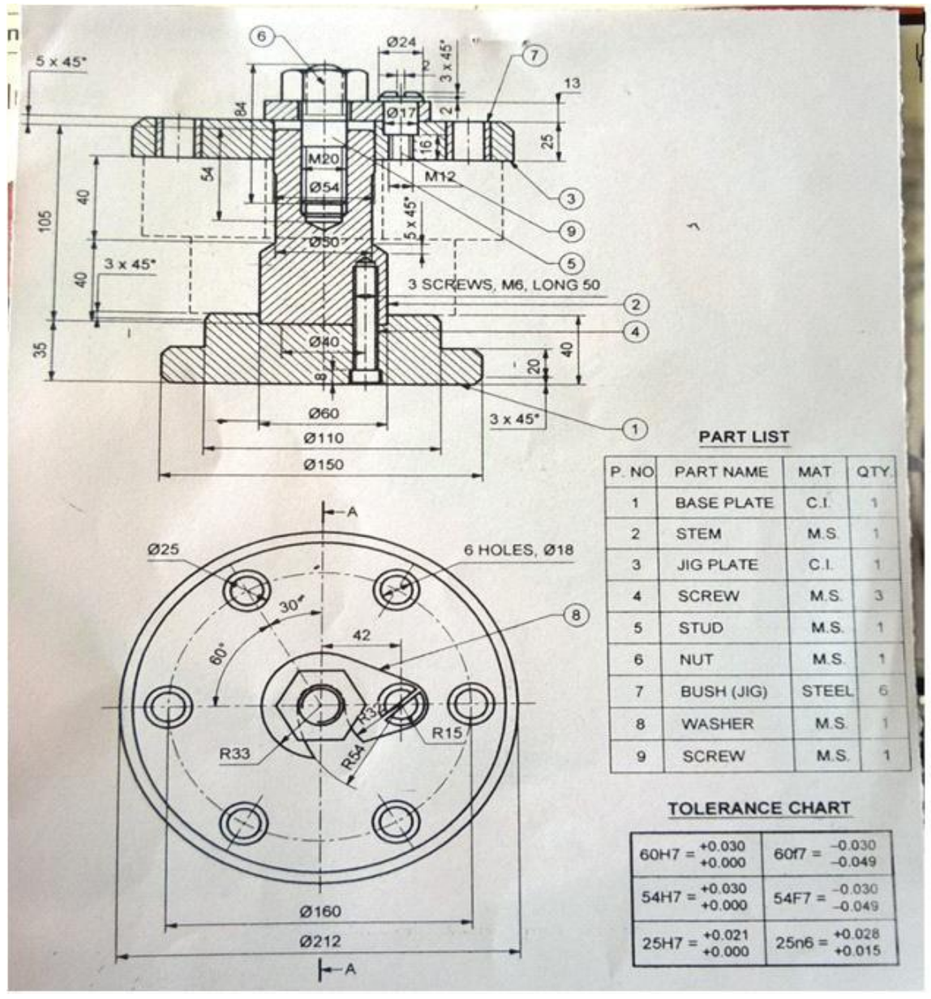
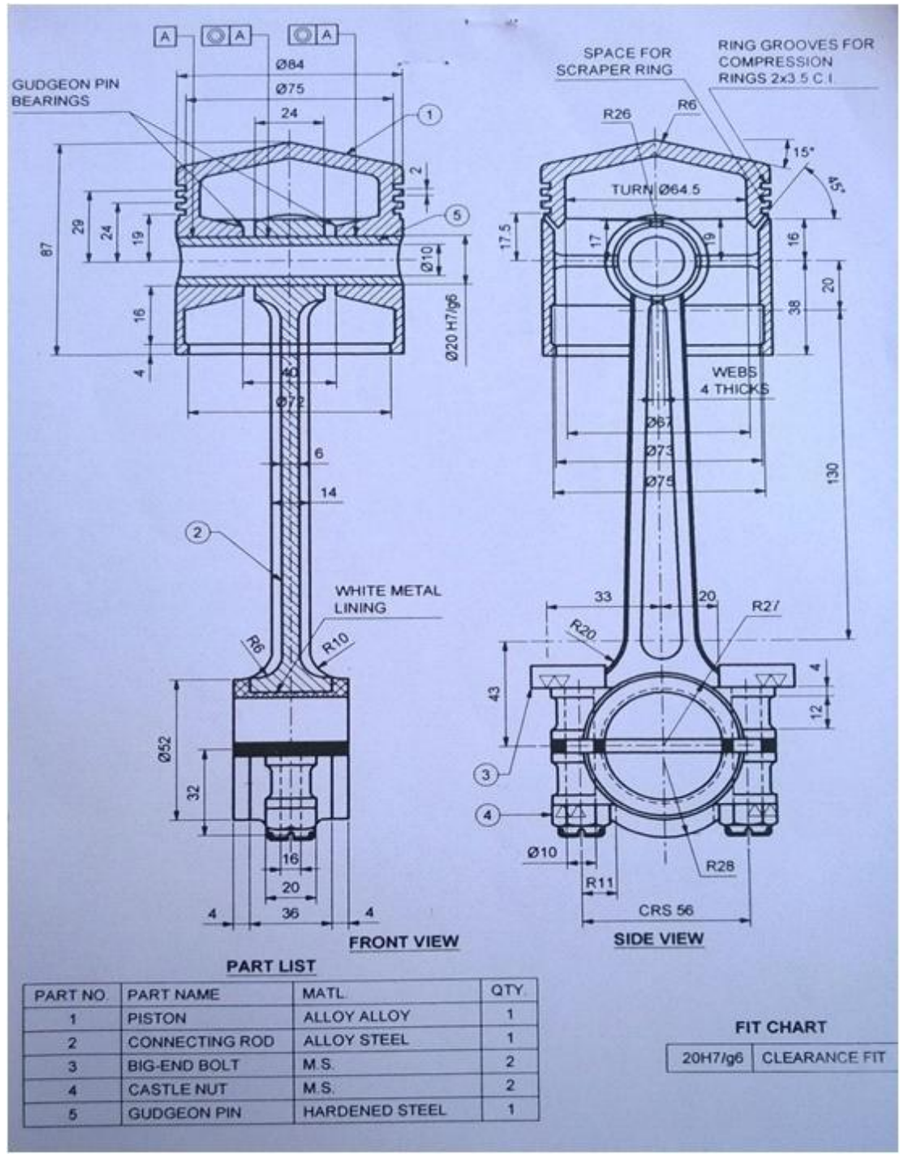


Figure 10

Mechanical Working Drawing (22341)

3. Figure 11.Shows the sectional front view, top view and sectional side view of an assembly of the piston and connecting rod. Draw the part drawings of the components.



PART NO.	PART NAME	MATL.	QTY.
1	PISTON	ALLOY ALLOY	1
2	CONNECTING ROD	ALLOY STEEL	1
3	BIG-END BOLT	M.S.	2
4	CASTLE NUT	M.S.	2
5	GUDGEON PIN	HARDENED STEEL	1

Figure 11.

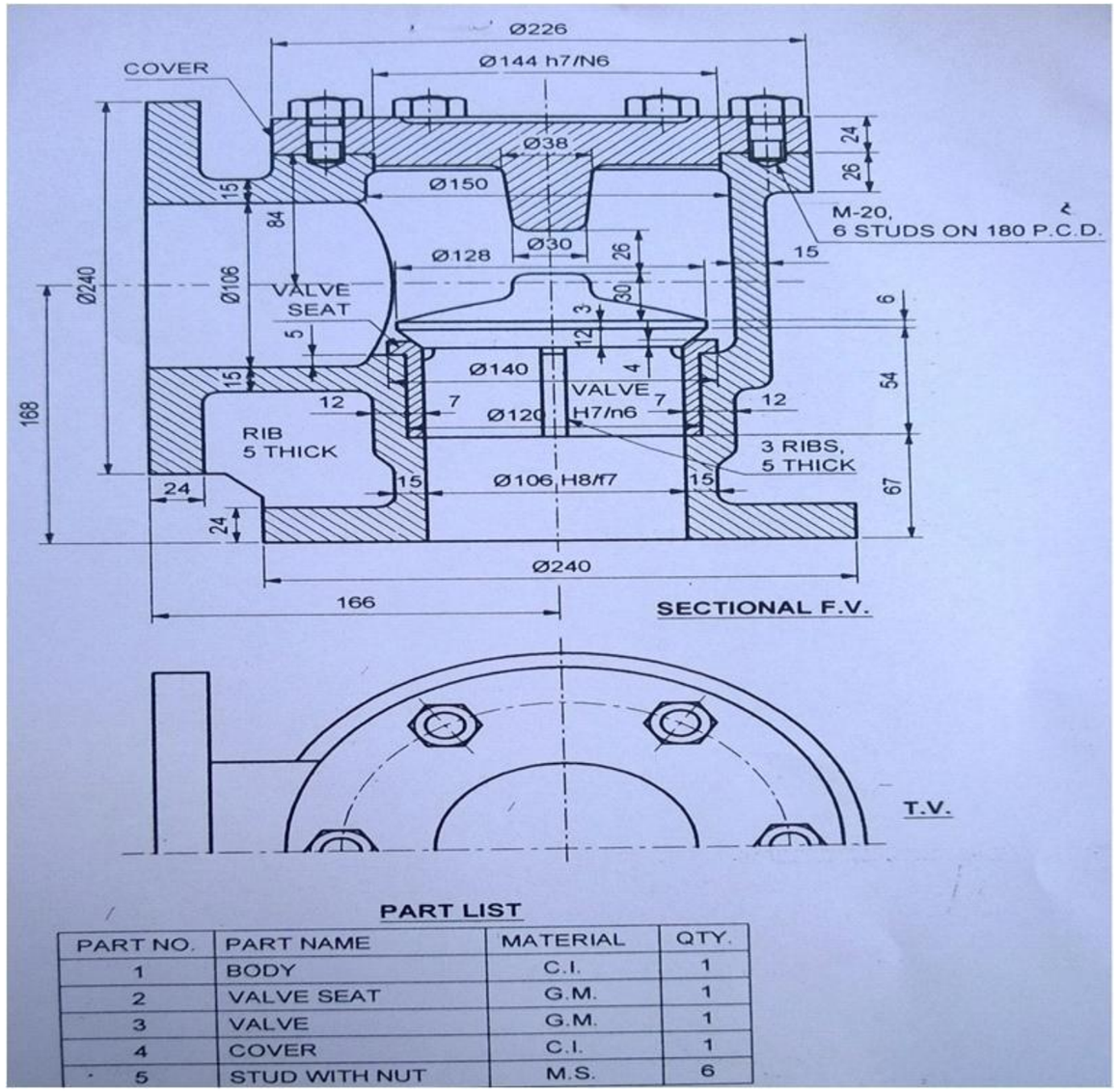
4. Figure 12. Shows the assembly of the non-return valve. Draw the following details:

(a) Body sectional FV.

(b) Cover.

(c)Valve seat

(d)Valve.



PART LIST

PART NO.	PART NAME	MATERIAL	QTY.
1	BODY	C.I.	1
2	VALVE SEAT	G.M.	1
3	VALVE	G.M.	1
4	COVER	C.I.	1
5	STUD WITH NUT	M.S.	6

Figure 12.