Second **Session- 2018-19**

Shri Ramdeobaba College of Engineering & Management, Nagpur.

Department of Mechanical Engineering

Engineering Graphics and Design(MEP151)

Sheet Problems

Sheet No.:- 1. **Engineering Curves** **(Manual+AutoCAD)**

1. An artificial satellite is orbiting around the earth. The major axis of its orbit is 40000km and the minor axis is 30000km. Draw the orbit of the satellite and shoe the position of earth centre. Assuming that it is one of the foci.

2. An artillery gun fires a bombshell from ground surface to a largest on the same level and 15km away. Bomb shell achieves a maximum height of 5km. Draw path traced by shell selecting a suitable scale.

3. $0.025m^3$ of air at a pressure of $6kgf/cm^2$ absolute expands until its volume is $0.25m^3$. The relation between the pressure and the volume is given by the formula PV=0.15. Construct the expansion curve. Choose pressure scale $1cm=0.5kgf/cm^2$ and the volume scale $1cm=0.05m^3$. Name the curve.

4. A wheel of a cart 1m in diameter rolls on a plane road in a straight line. Draw the path of a point on the rim for one complete revolution.

5. Draw the involute of a given circle of diameter‘d’ is equal to 50mm.

Sheet No.:- 2. **Orthographic Projection** **(Manual+AutoCAD)**

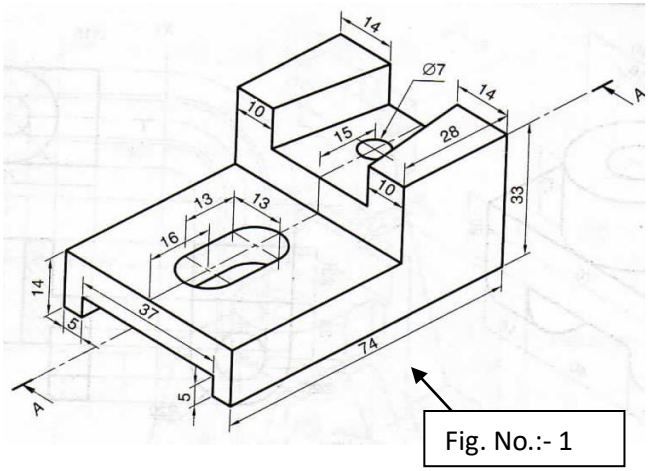

Fig. No.:- 1

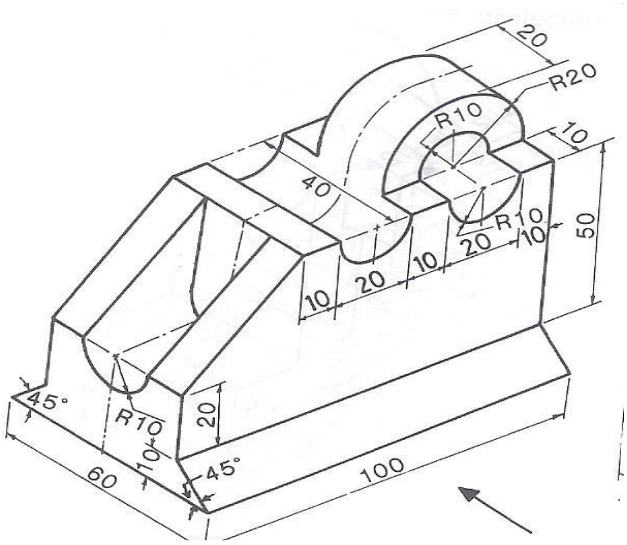

Fig. No.:- 2

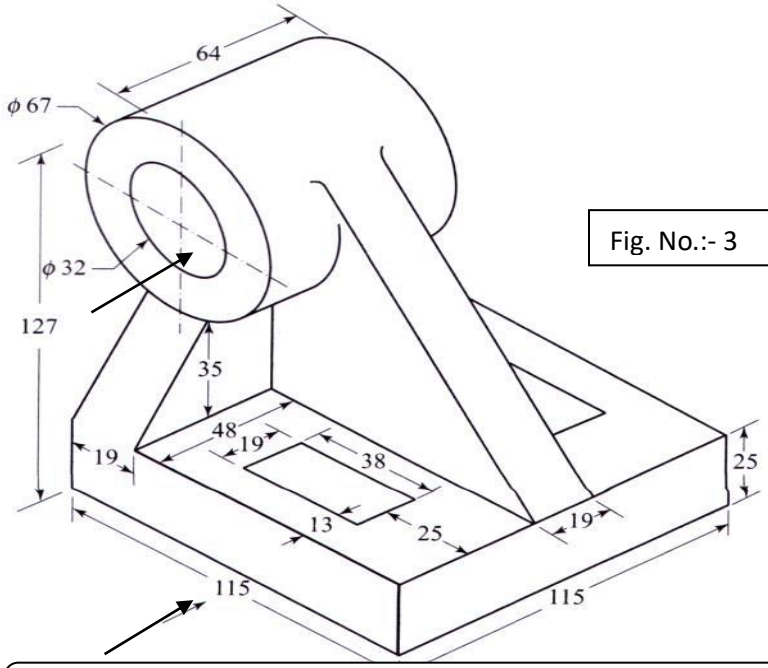

Fig. No.:- 3

Figure 1: Draw FV, TV & SV

Figure 2: Draw FV & TV

Figure 3: Draw FV & TV

Sheet No: - 03 **Projection of Lines**

1 A line AB 90 mm long is inclined at 45º with HP and it's Top view makes an angle of 60º with VP. The end A is in HP, & 12 mm in front of VP. Draw the projections and find its inclination with VP.

2 The Front view of a 90 mm long line PQ measures 60 mm and its Top view measures 70 mm. Its end Q and the mid-point M are in first quadrant, M being 40mm from both the planes. Draw the projections of line PQ.

3 A line CD, inclined at 25^0 to the HP measure 80 mm in TV. The end C is in the first quadrant and 24 mm and 14 mm from HP and VP respectively. The end D is at equal distances from both the RP. Draw the projections find True length and True inclination with VP.

4 A and B are the ends of a straight line AB. The end A is 65mm above HP and 40mm in front of VP. The end B is 15mm above HP and 75mm in front of the VP. The distance between the projectors along XY line is 65mm. Draw the projections of the line AB and determine its inclination with HP and VP.

Sheet No: - 04 **Projection of Planes**

1 Draw the projections of a circle of 75 mm diameter having the end A of the diameter AE in the HP, the end E in the VP, and the surface inclined at 30^0 to the HP and at 60^0 to the VP.

2 A regular pentagon of 30 mm sides is resting on HP on one of its sides with its surface 45^0 inclined to HP. Draw its projections when the side in HP makes 30^0 with VP.

3 A rhombus of diagonals 40 mm and 70 mm long respectively having one end of its longer diagonal in HP while that diagonal is 45^0 inclined to HP and makes 30^0 inclinations with VP. Draw its projections.

4 A semicircular plate of 80 mm diameter has its straight edge in the VP, and inclined at 45º to the HP. The surface of the plate makes an angle of 30º with the VP. Draw its projections.

Sheet No: - 06 **Projection of Solids**

1. A cylinder of base 60 mm diameter and height 80 mm has the midpoint of the axis 60 mm away from both the RP. The axis is inclined at 30^0 to the VP and 60^0 to the HP. Draw the projections.

2. Draw the projections of cone, base 50 mm diameter and axis 75 mm long, lying on a generator on the ground with the top view of the axis making an angle of 45^0 with the VP.

3. Draw the three views of a cube of side 60 mm when solid diagonal is parallel to H.P. and perpendicular to V.P.

4. A pentagonal pyramid, side of base 30mm and height 70mm rests on one of the corners of its base on HP the base being tilted up until the vertex is 60mm above HP. Draw three views of the pyramid with the edge of the base opposite to the corner on which it is resting made inclined at 60^0 to VP.

Sheet No: - 06 **Section and Development of Solids**

1. A cone, base 65 mm diameter and axis 75 mm long, is lying on the ground on one of its generators with the axis parallel to the VP. A section plane which is parallel to VP cuts the cone 6 mm away from the axis. Draw the sectional front view and development of the surfaces of the remaining portion of the cone.

2. A square pyramid base 40 mm side and axis 65 mm long has its base on the HP and all the edges of the base are equally inclined to the VP. It ia cut a section plane perpendicular to the VP, inclined at450 to the HP and bisecting the axis. Draw the sectional top view, true shape of the section and also draw its development.

Sheet No: - 07 **Isometric Projections**

Draw Isometric Projection for Figure 1 & Isometric View for Figure 2, Figure 3

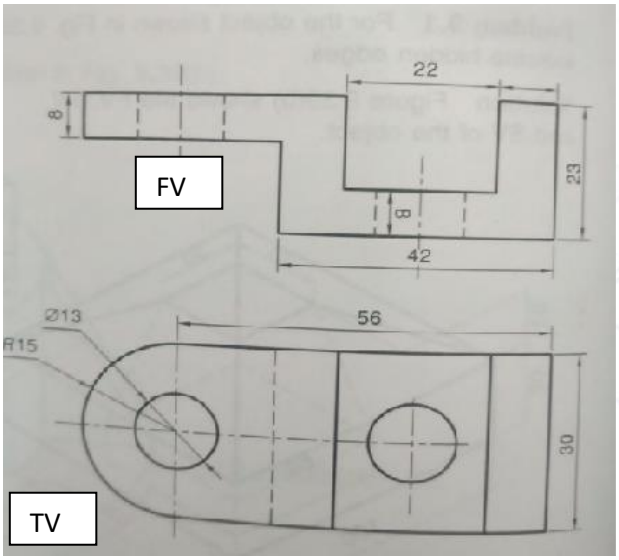

Figure No. 1

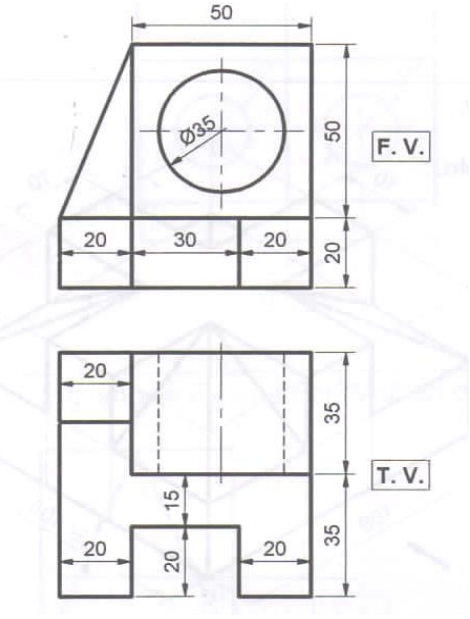

Figure No. 3

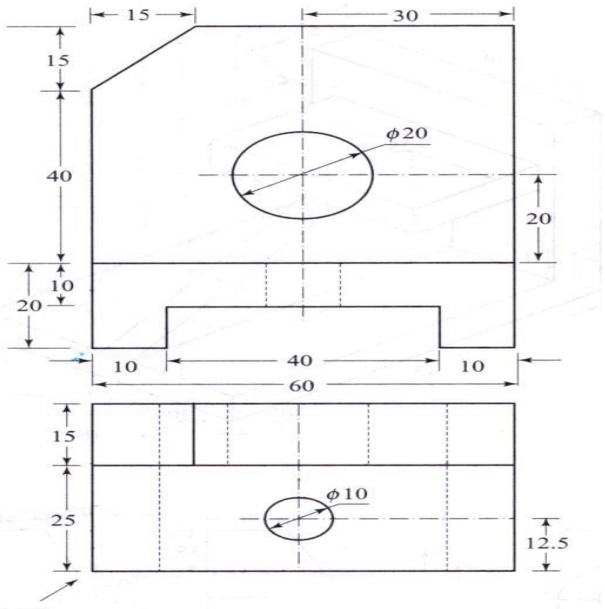

Figure No. 2

Figure Not to Scale

All Dimensions are in MM