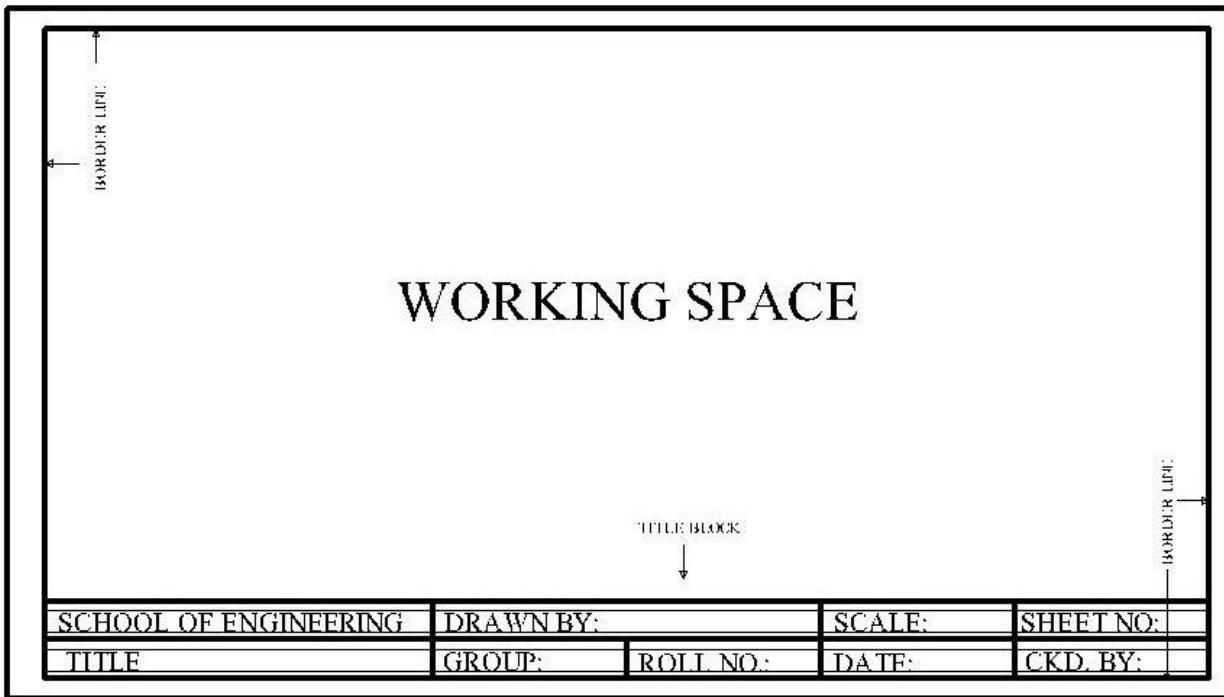


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1: SHEET PREPARATION AND TECHNICAL LETTERING

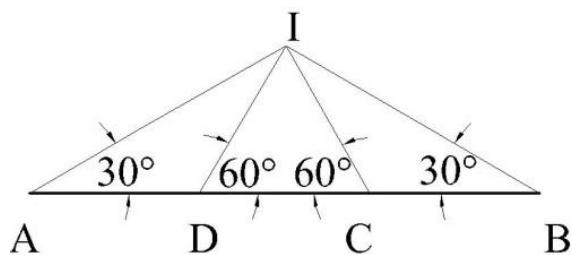
- 1) Prepare Drawing sheet
- 2) Write freehand, in single stroke vertical capital letters, small letters and numerals, using the ratio 7:5.



2: APPLIED GEOMETRY

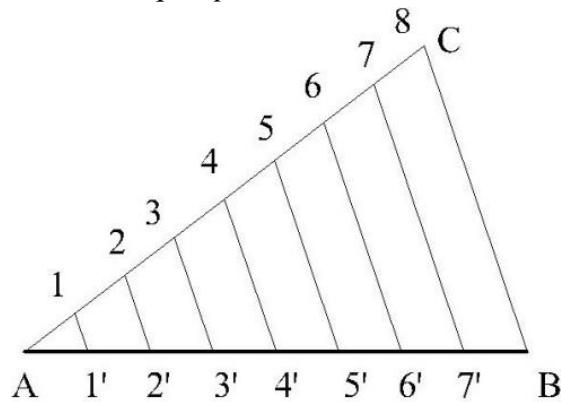
2.1 Geometrical construction

1. Trisect 100mm long straight line.



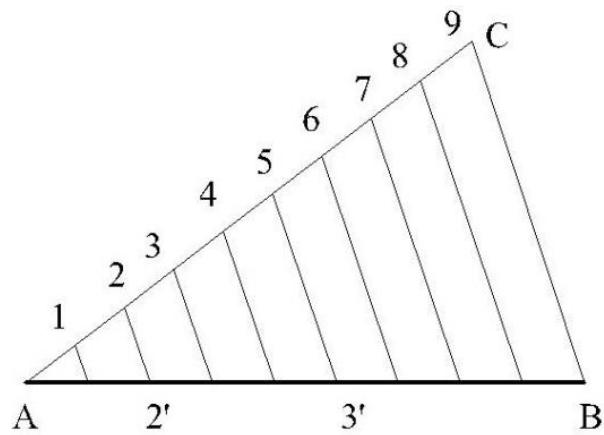
TRISECTION OF A STRAIGHT LINE

2. Divide 100mm long straight line in to 6 equal parts.



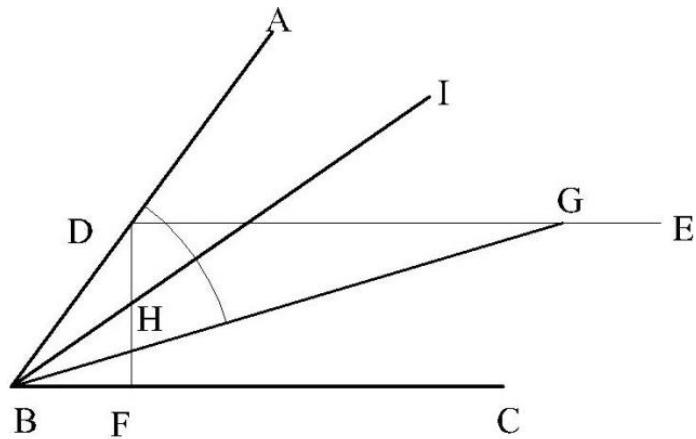
DIVISION OF A STRAIGHT LINE INTO
EQUAL PARTS

3. Divide 100mm long straight line in to 2:3:4 ratio.



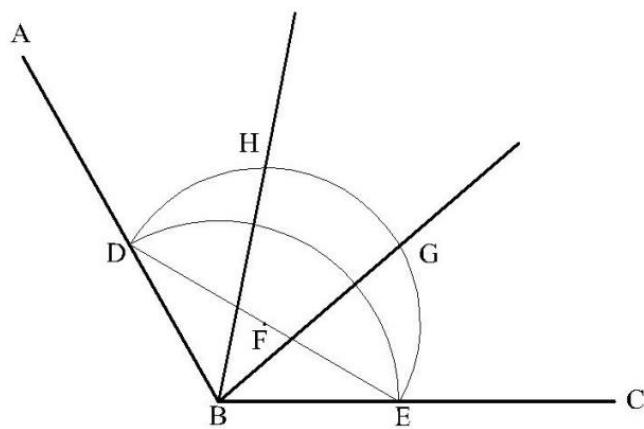
DIVISION OF A STRAIGHT LINE INTO
GIVEN RATIO

4. Trisect an acute angle.



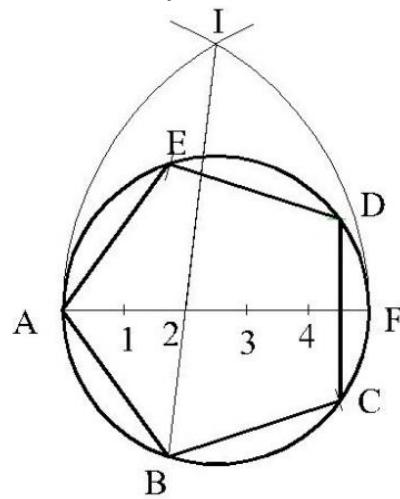
TRISECTION OF AN ACUTE ANGLE

5. Trisect an obtuse angle.



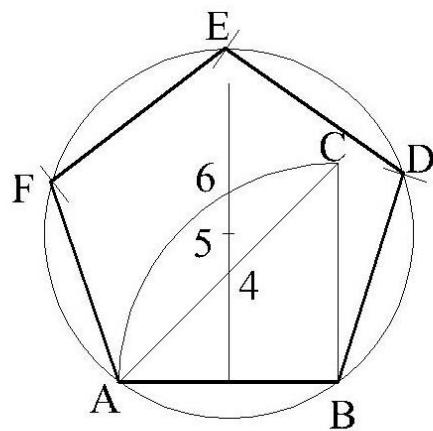
TRISECTION OF AN OBTUSE ANGLE

6. Construct a regular pentagon, inscribed in a circle of diameter 70mm.



REGULAR PENTAGON INSCRIBED IN A GIVEN CIRCLE

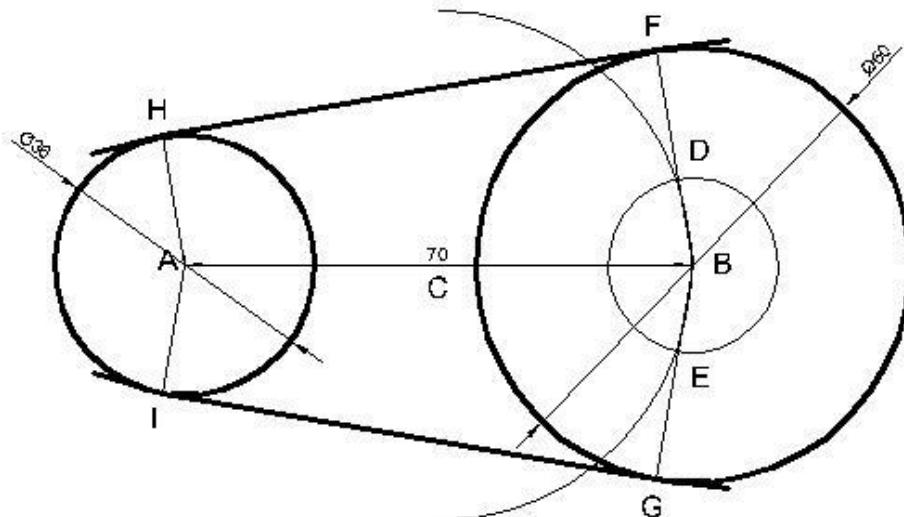
7. Construct a regular pentagon having sides 40mm.



REGULAR PENTAGON HAVING GIVEN SIDE LENGTH

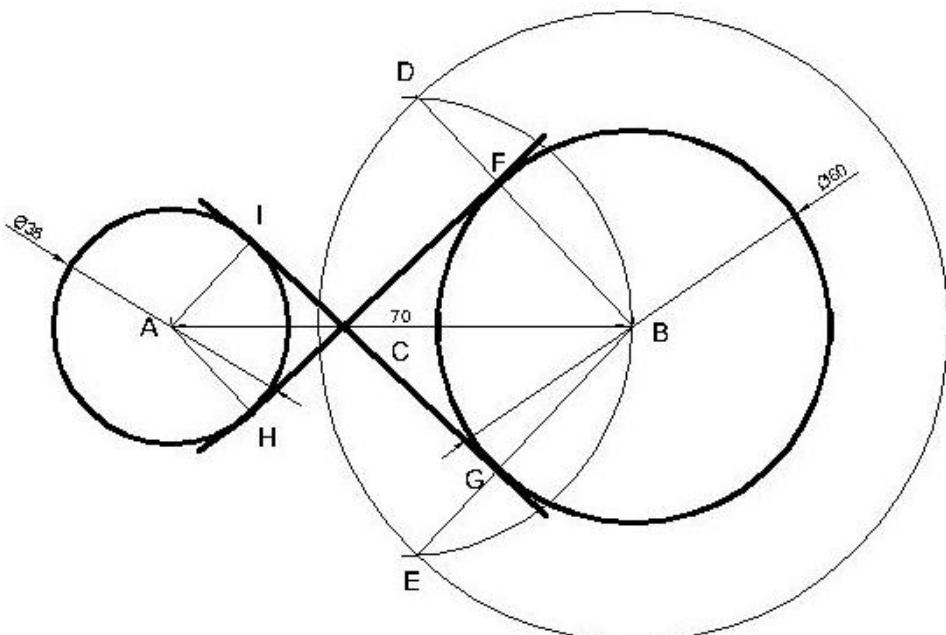
2.2 Tangents

- 1) Construct an external (uncrossed) common tangent between two different circles of diameters 60mm and 30mm respectively, where center to center distance of circles is 70mm.



EXTERNAL COMMON TANGENT

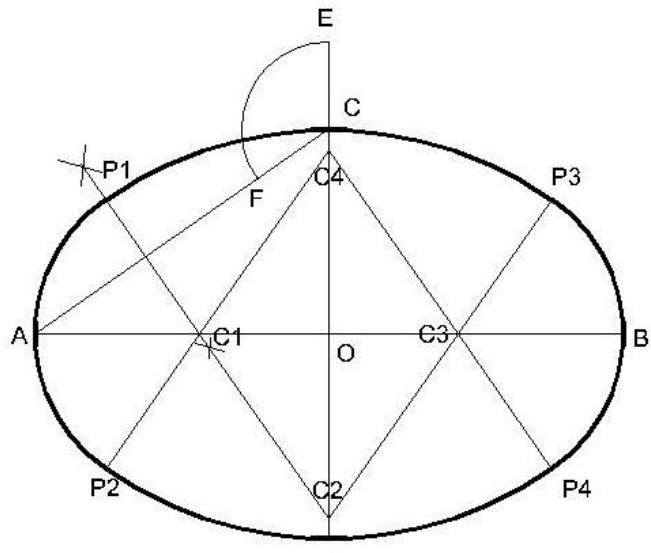
- 2) Construct an internal (crossed) common tangent between two different circles of diameter 60 mm and 30mm respectively, where center to center distance of circles is 70.



INTERNAL COMMON TANGENT

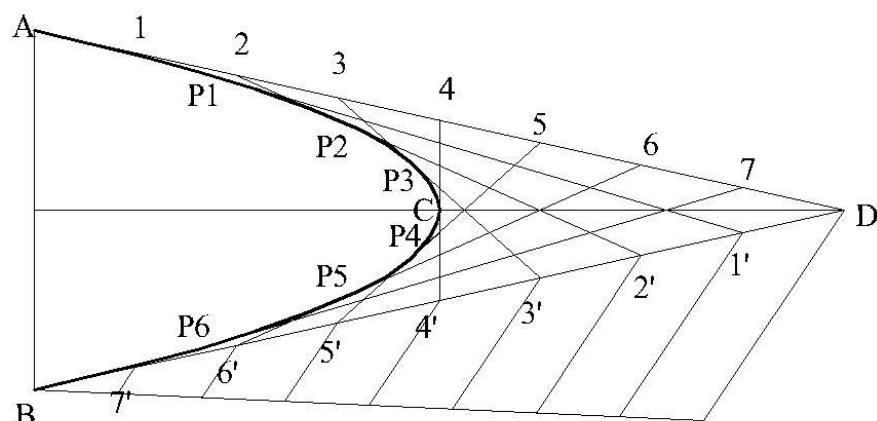
2.3 Conic section

- 1) Construct an ellipse by using four center methods, where the major axis is 100mm and minor axis is 70 mm.



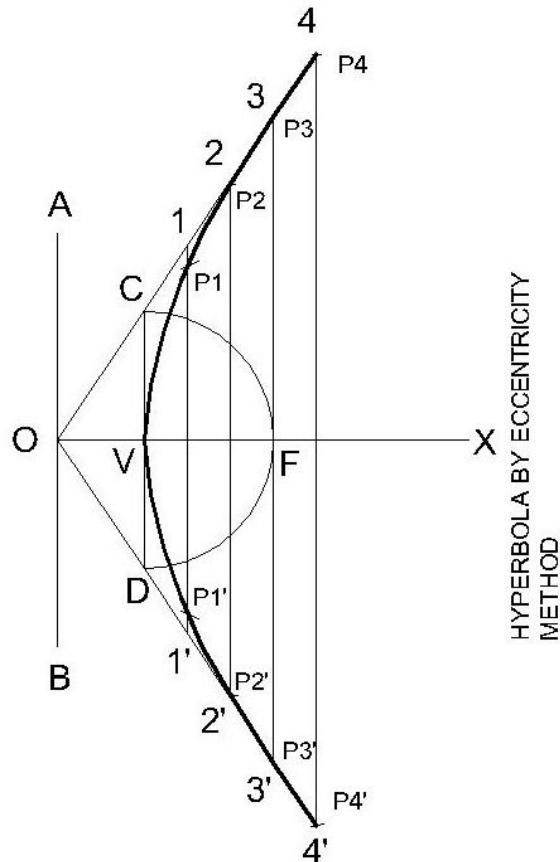
ELLIPSE BY FOUR CENTER METHOD

- 2) Draw a parabola by using triangular/tangent method where base of parabola is 70mm and height of axis is 60mm.



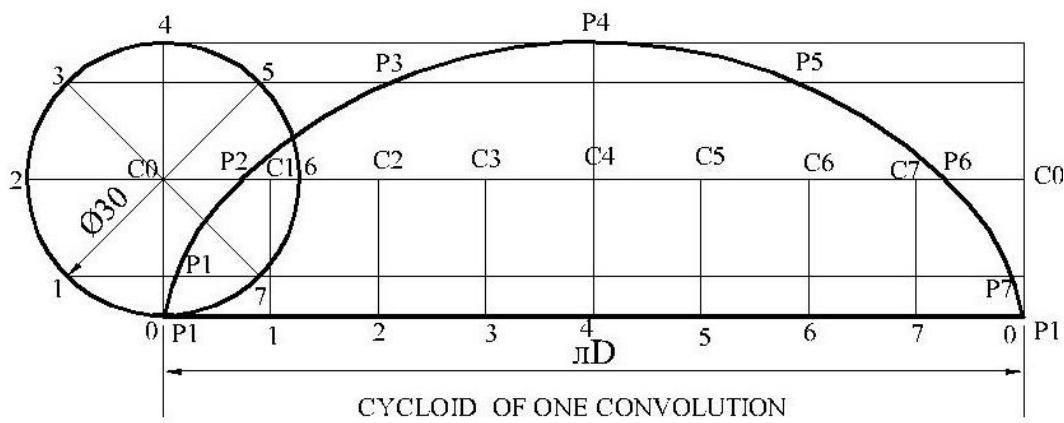
PARABOLA BY TANGENT/TRIANGULAR METHOD

- 3) Construct a hyperbola when the distance of the focus from directrix is 35mm and eccentricity is 3/2.(Definition /eccentricity method)

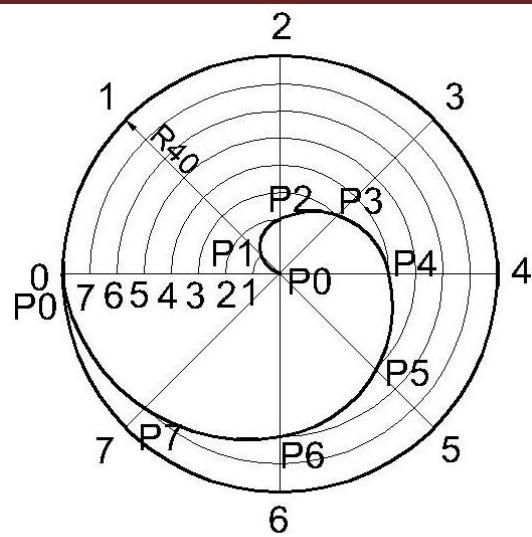


2.4 Curves and helix

- 1) Draw a cycloid of circle of diameter 40mm.

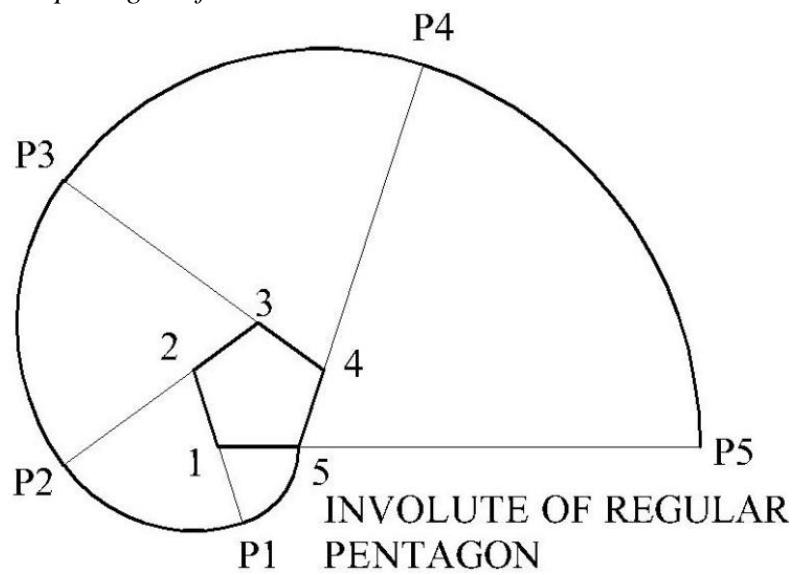


- 2) Draw an Archimedean's spiral of one convolution, where the radius of circle is 40mm.



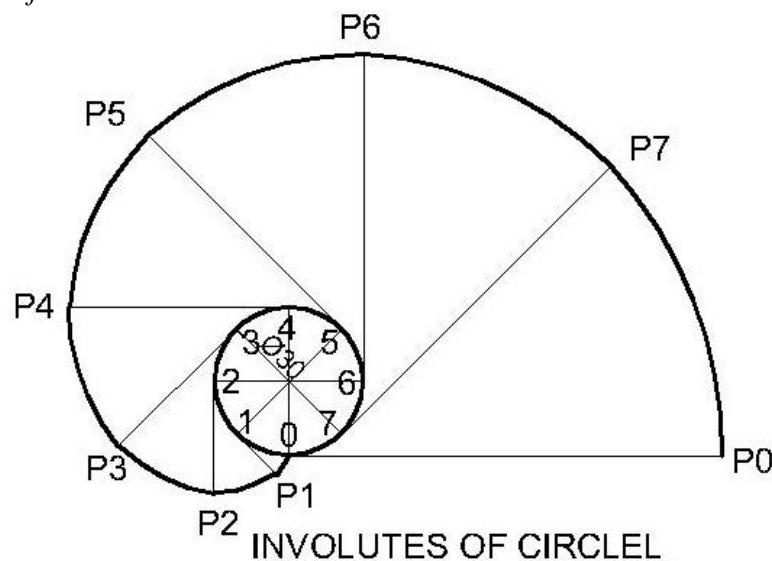
ARCHEMEDIAN'S SPIRAL

- 3) Draw involutes of regular pentagon of sides 20mm.



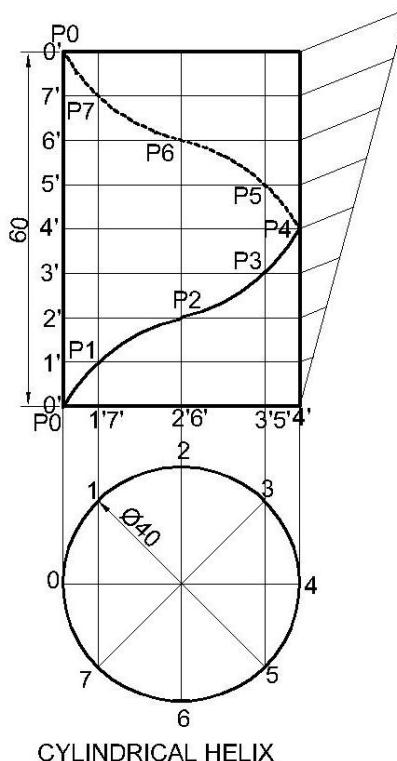
INVOLUTE OF REGULAR PENTAGON

- 4) Draw involutes of circle of diameter 30mm.



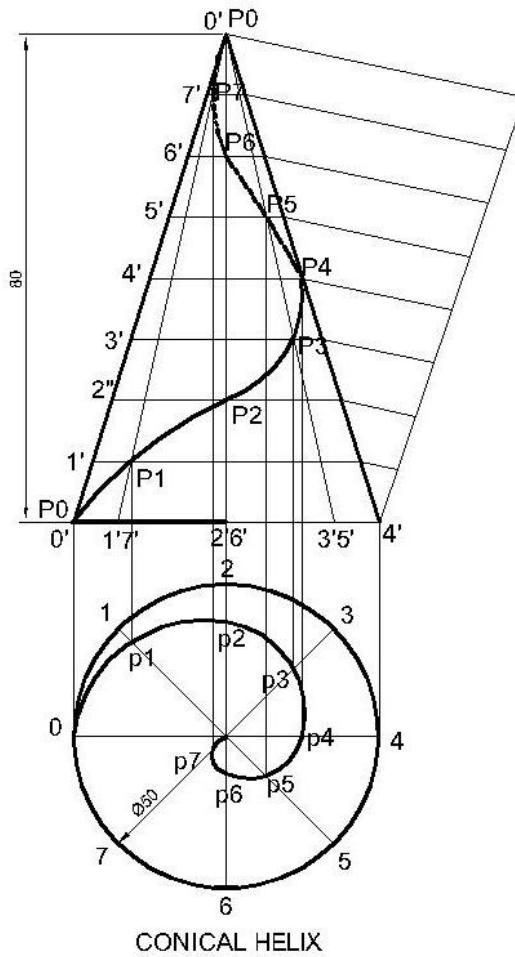
INVOLUTES OF CIRCLE

5) Draw a cylindrical helix of one convolution, where the diameter of cylinder is 40mm and height is 60mm.



CYLINDRICAL HELIX

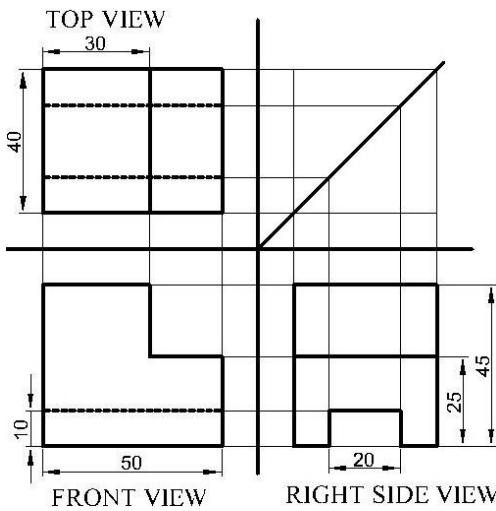
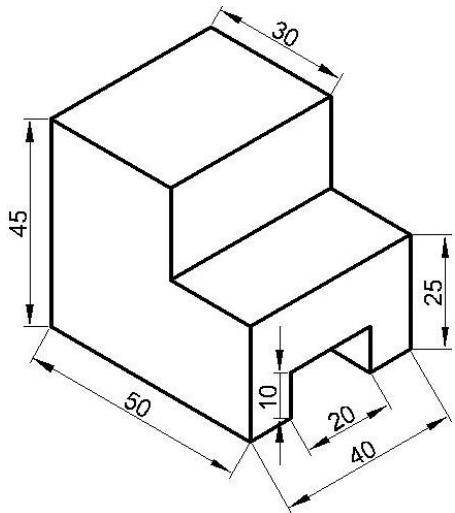
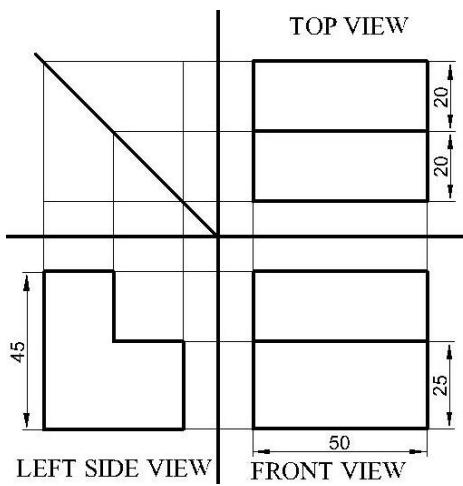
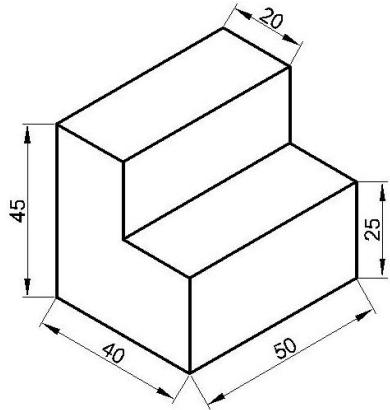
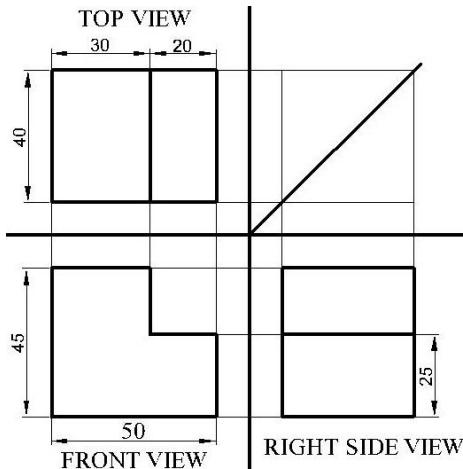
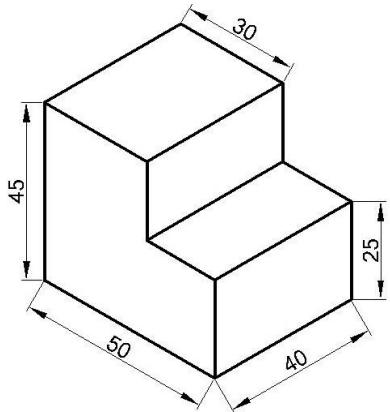
6) Draw a conical helix of one convolutions, where the base diameter of cone is 50mm and height is 80mm.

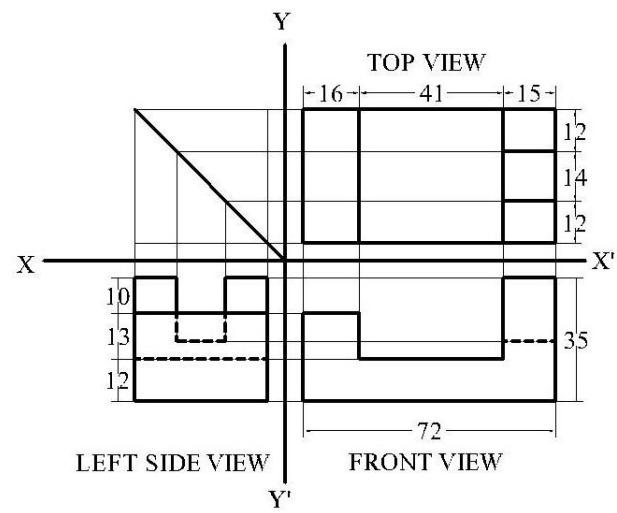
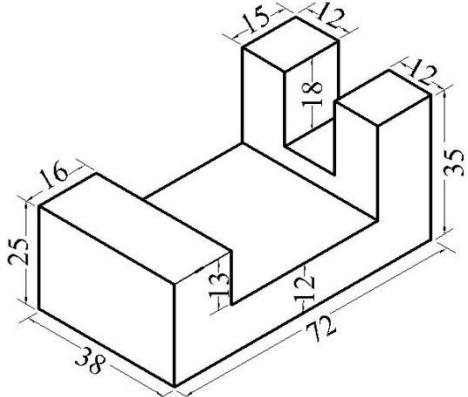
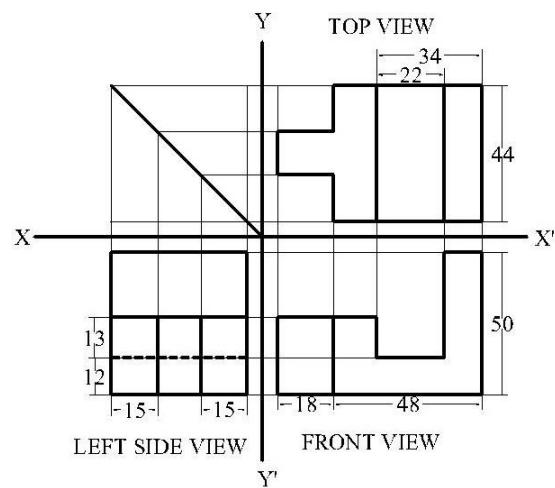
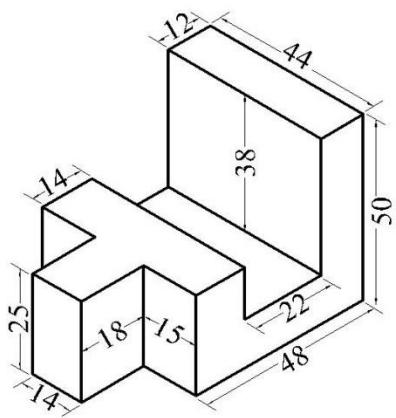
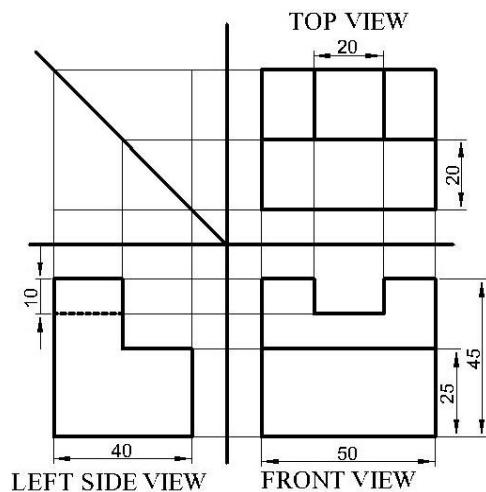
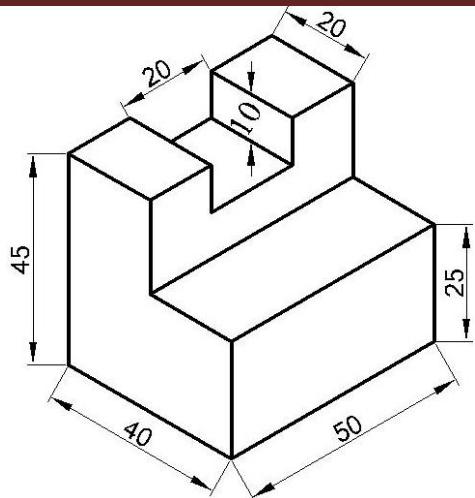


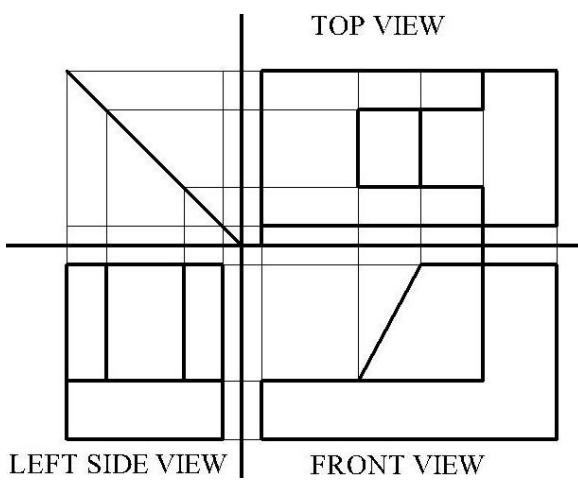
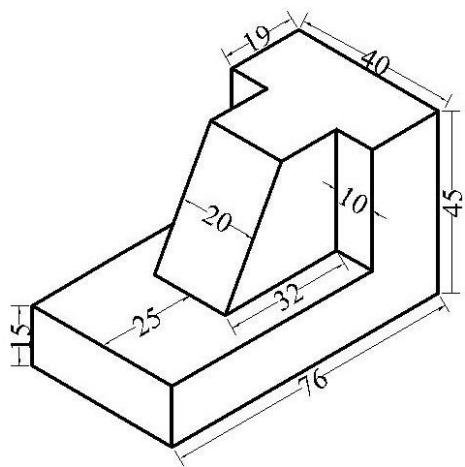
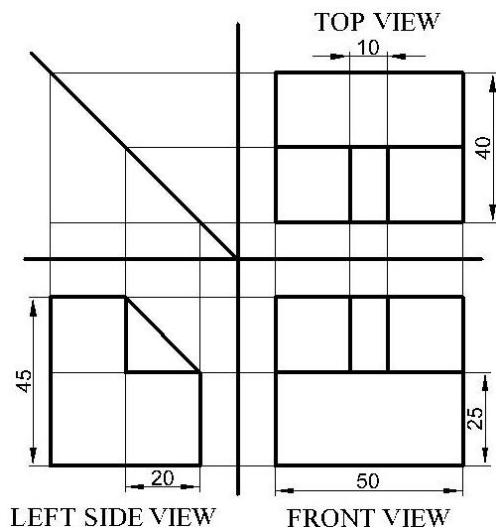
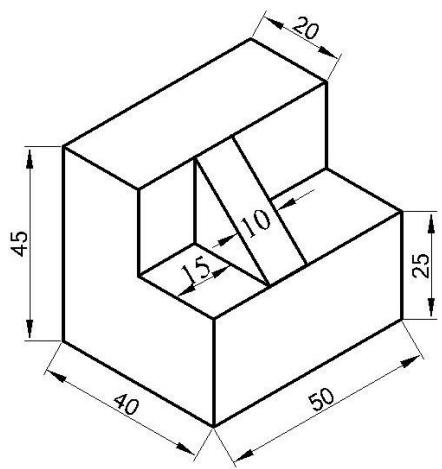
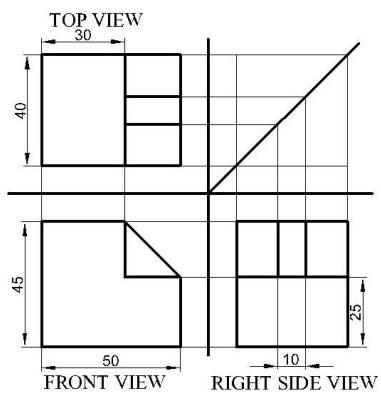
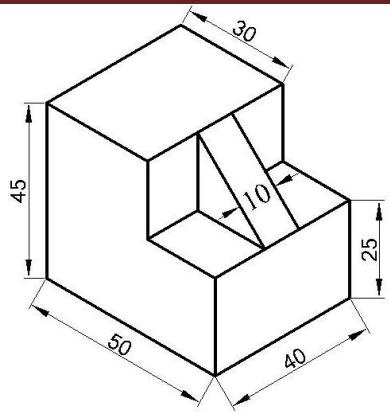
Orthographic projection

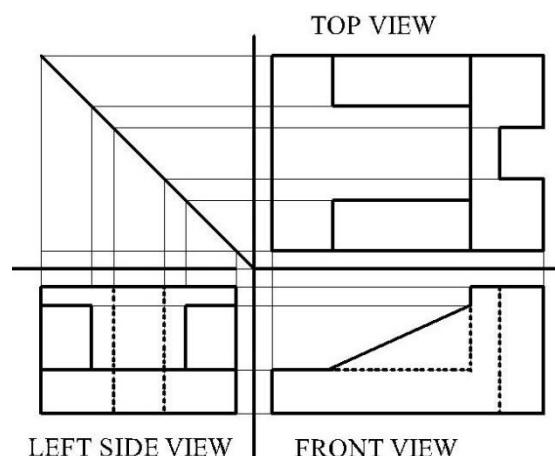
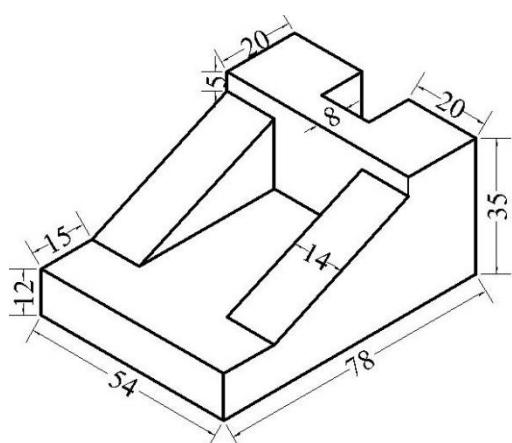
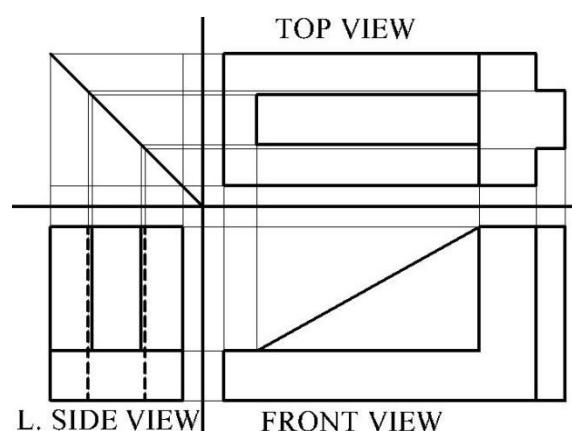
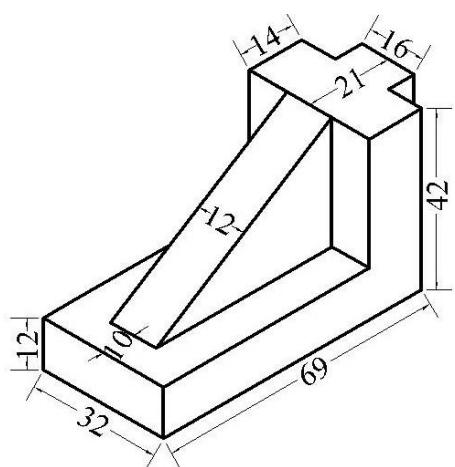
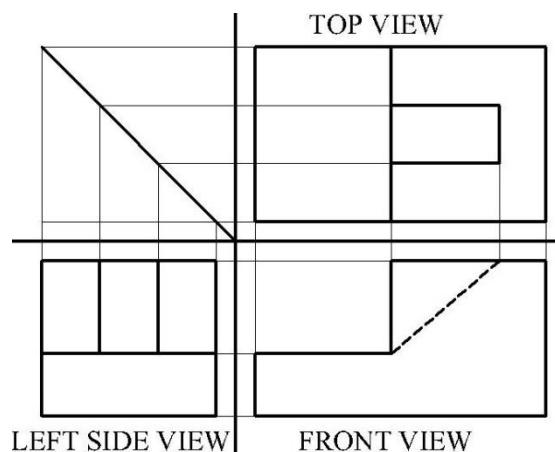
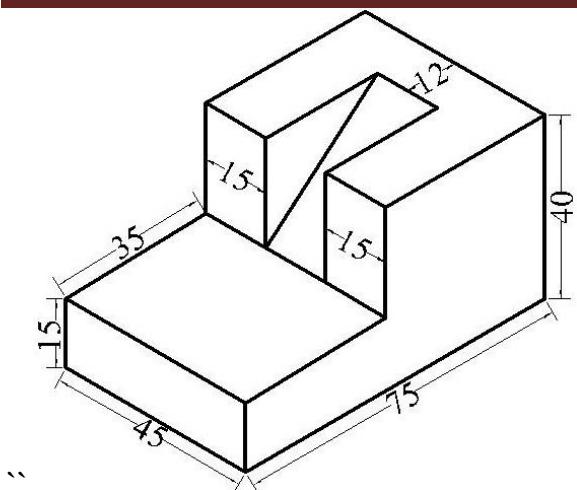
The projection or view obtained on a plane of projection or picture plane, when the projectors are parallel to each other but perpendicular to the picture plane is known as orthographic projection. Orthographic means to draw or to write at an right angle.

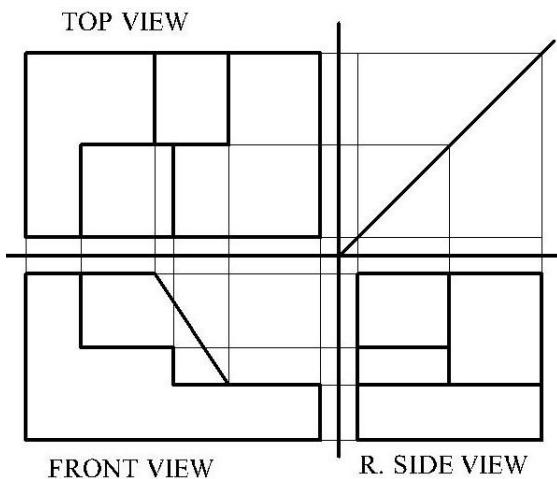
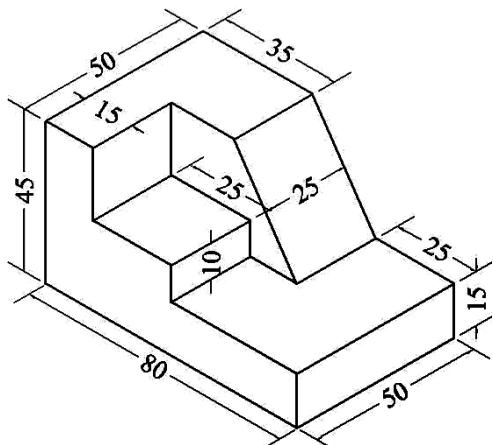
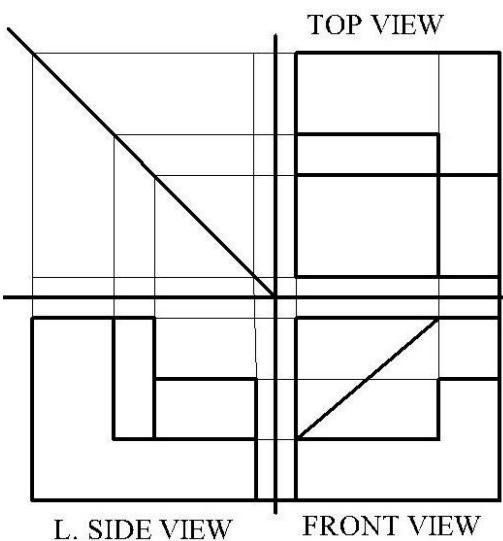
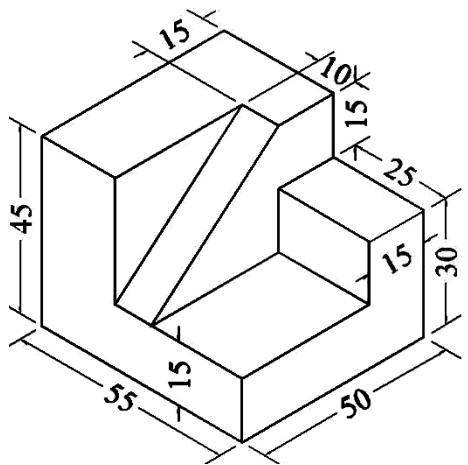
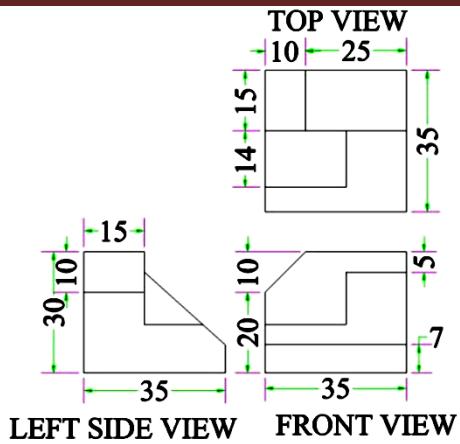
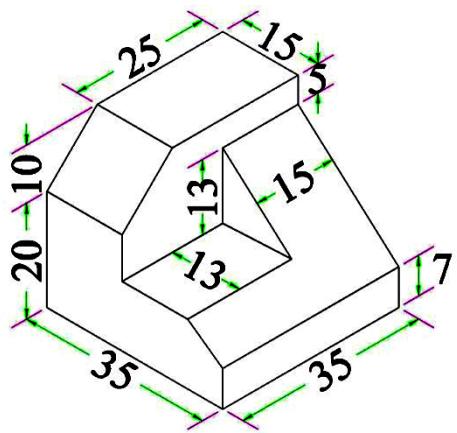
Draw complete orthographic views (Top, Side & Front) of the given solid figures.

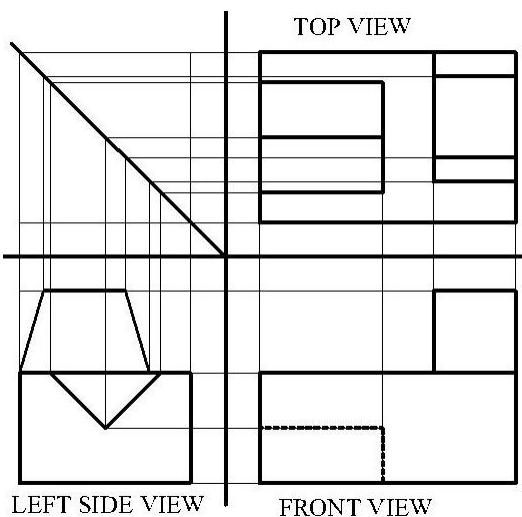
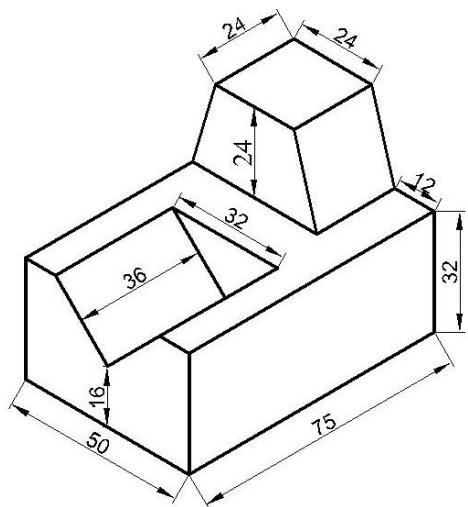
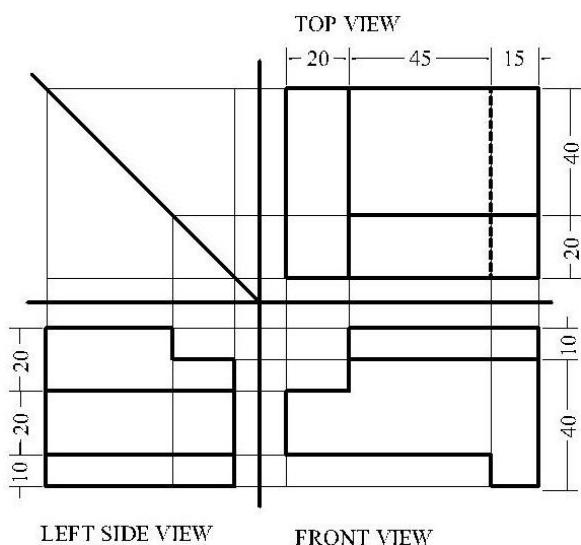
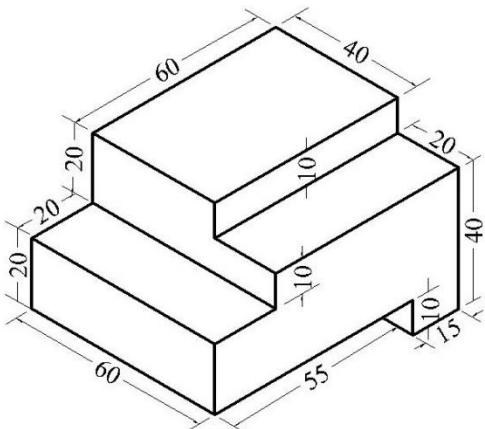
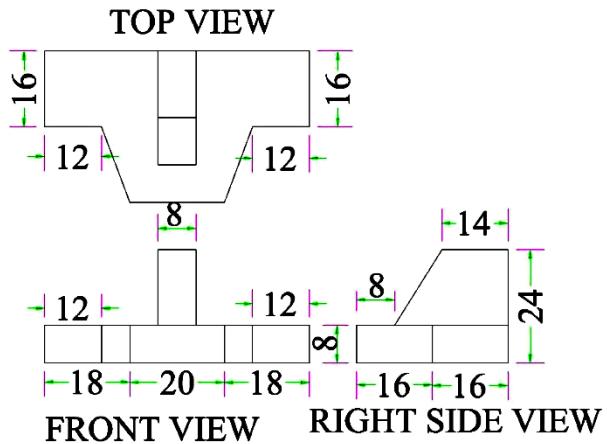
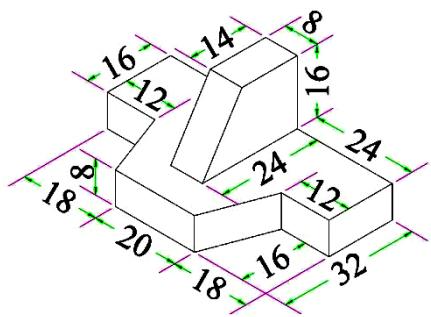


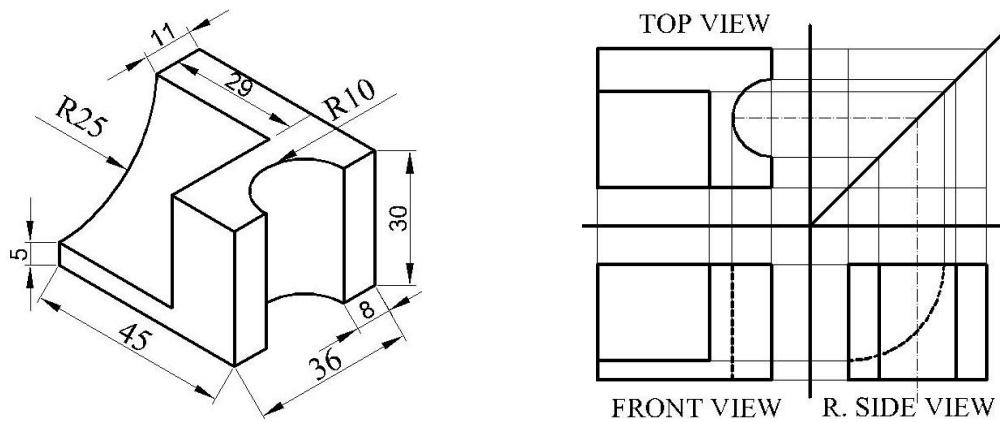
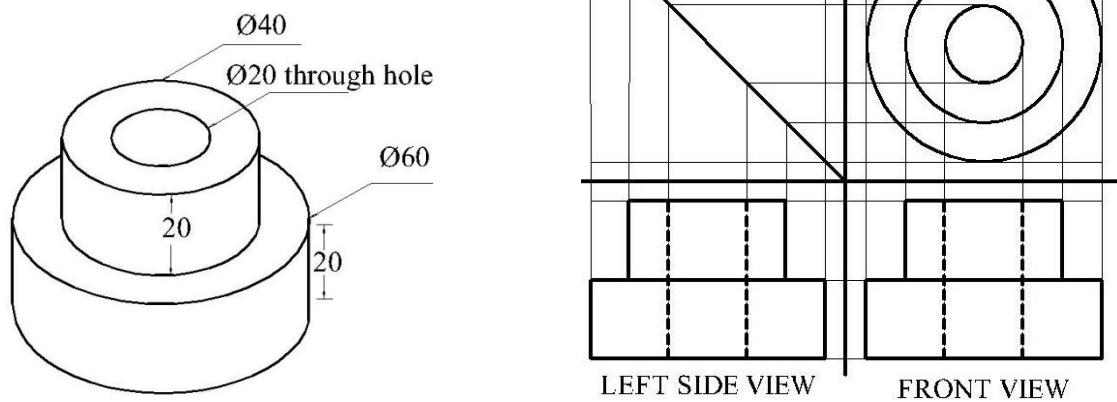
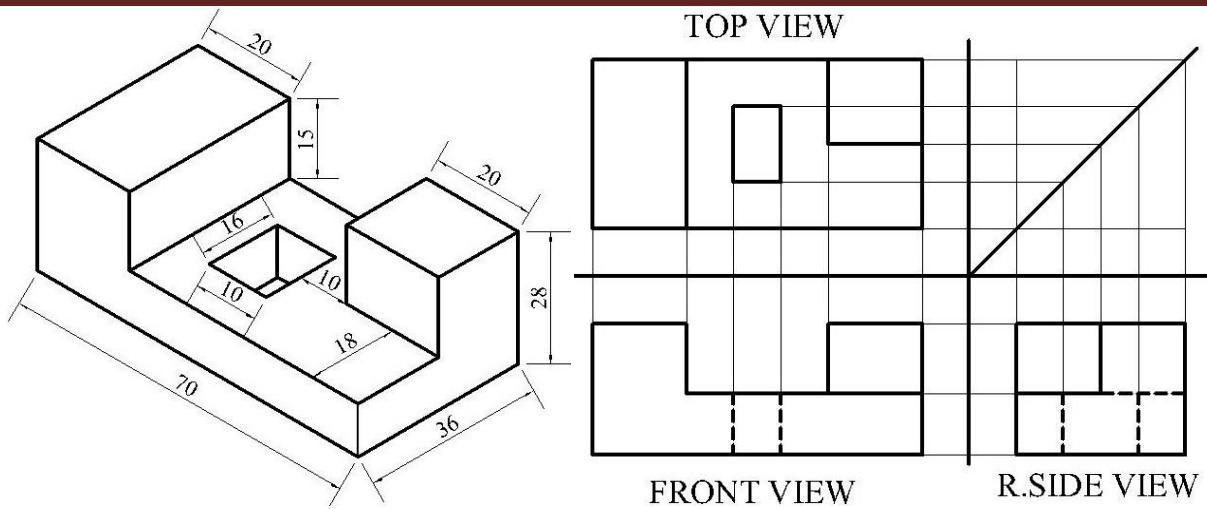


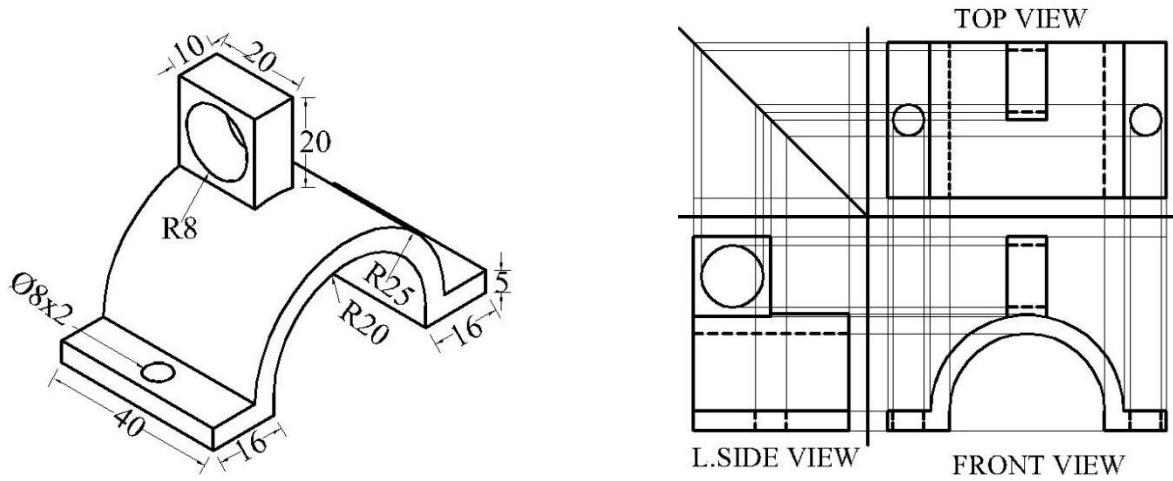
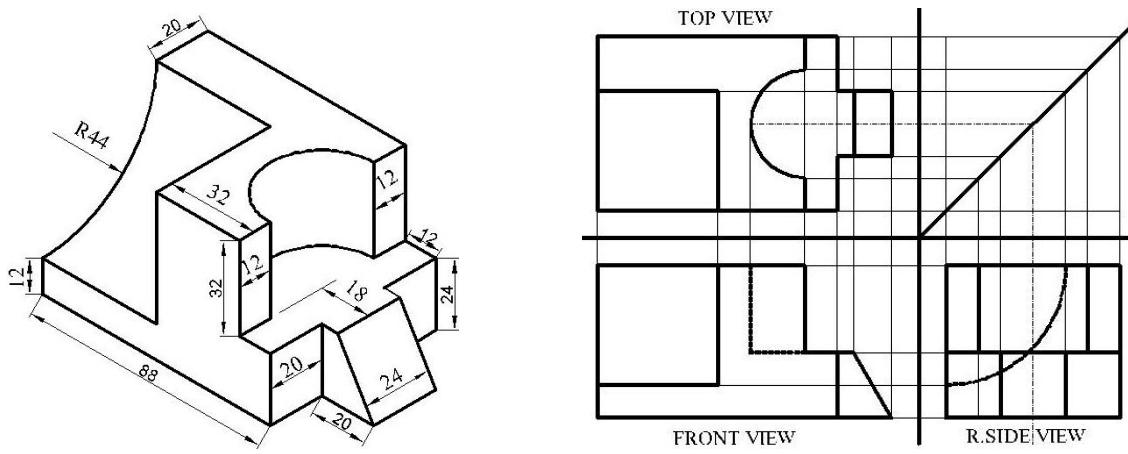
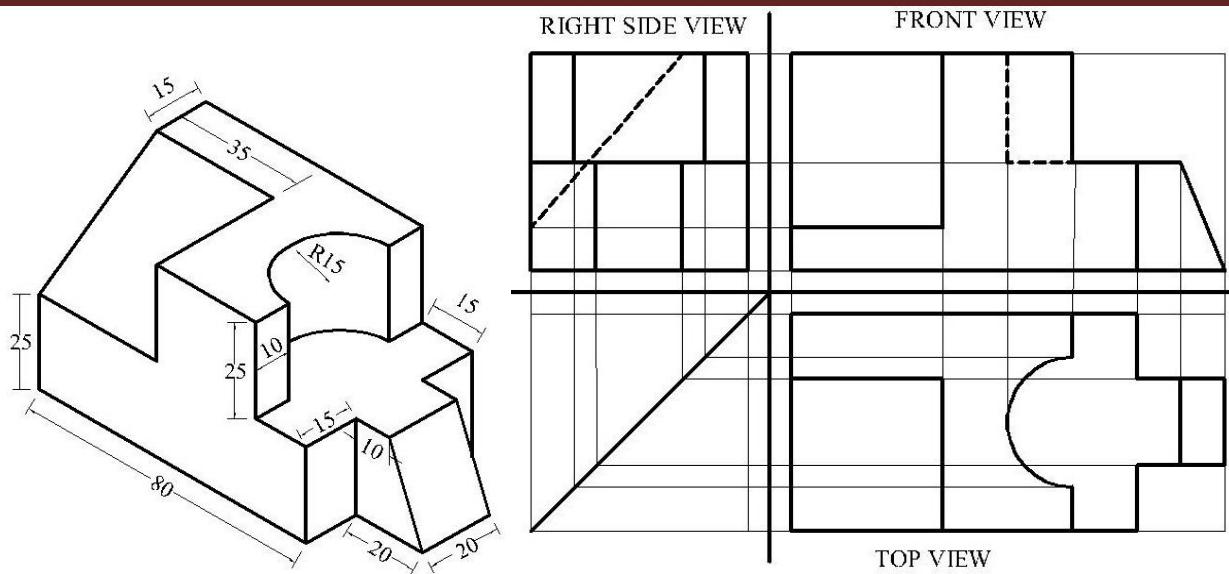


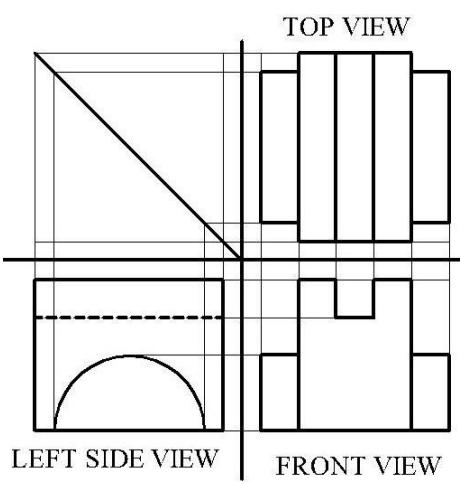
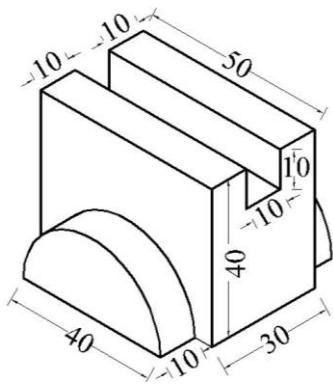
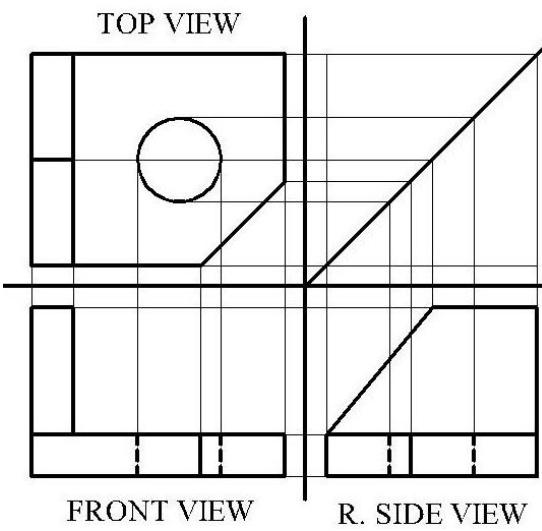
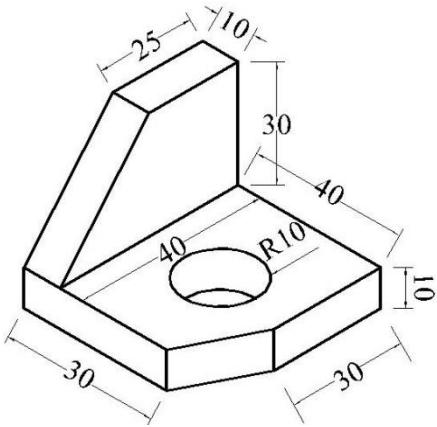
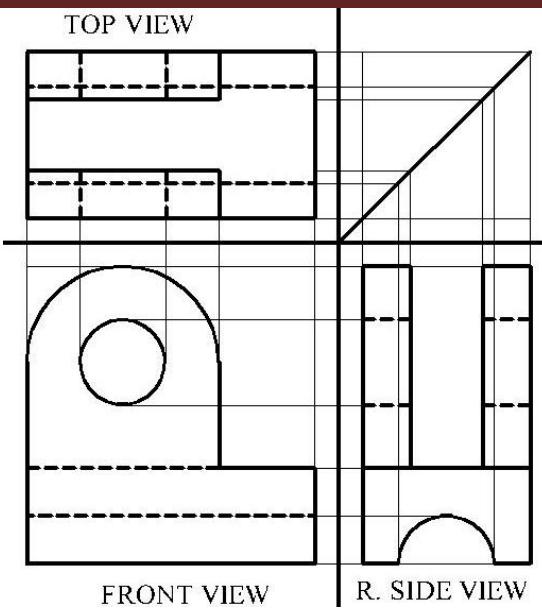
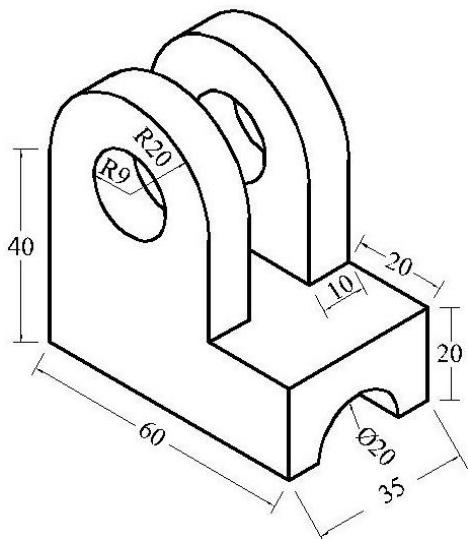


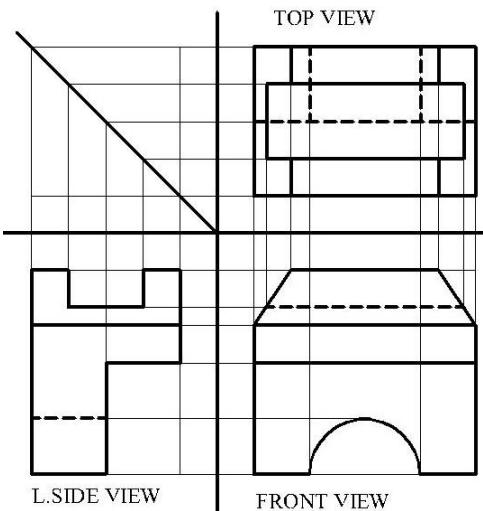
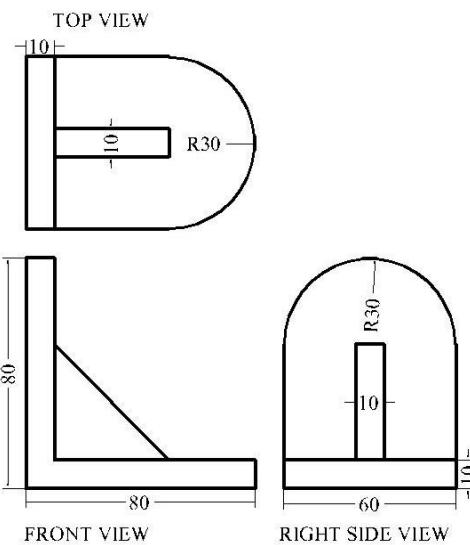
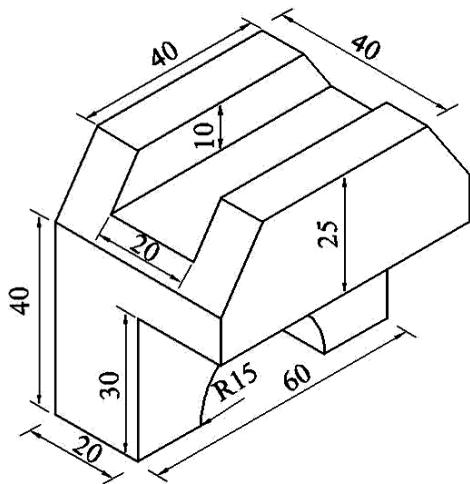
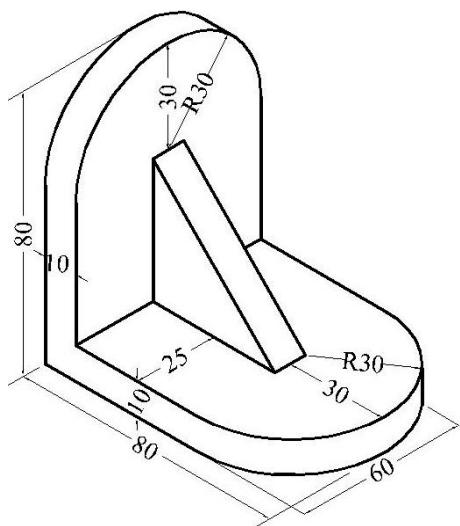
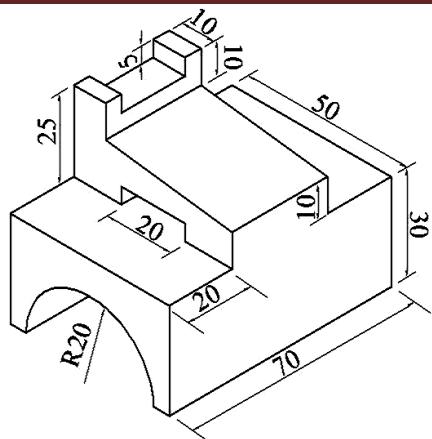


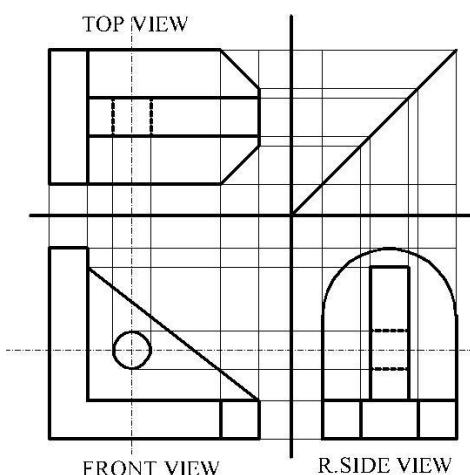
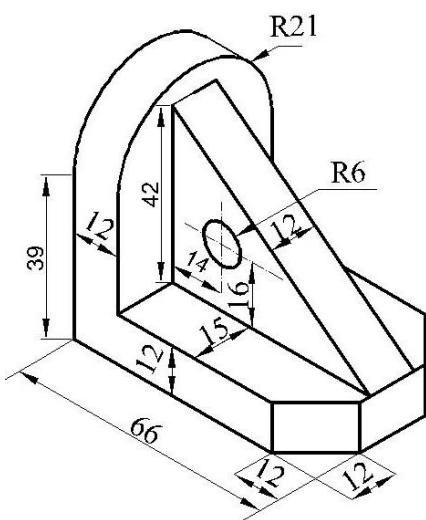
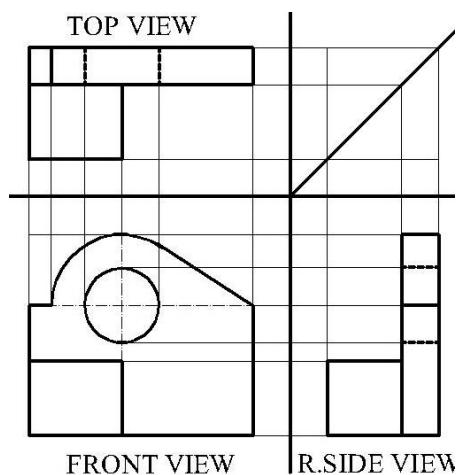
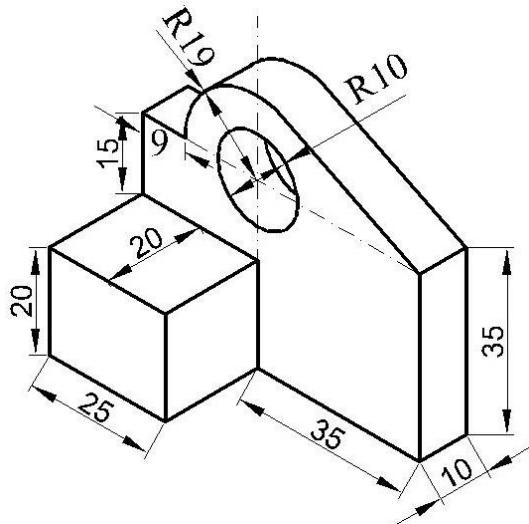
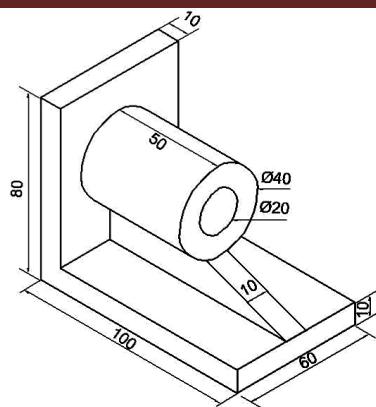


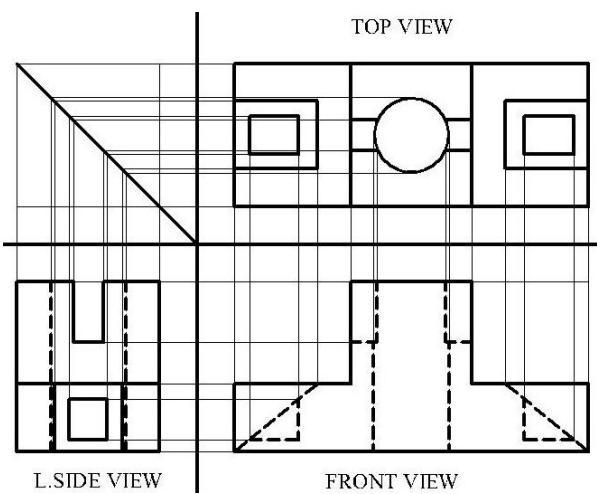
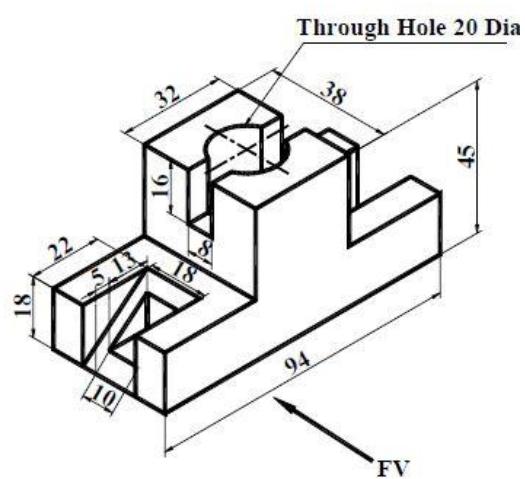
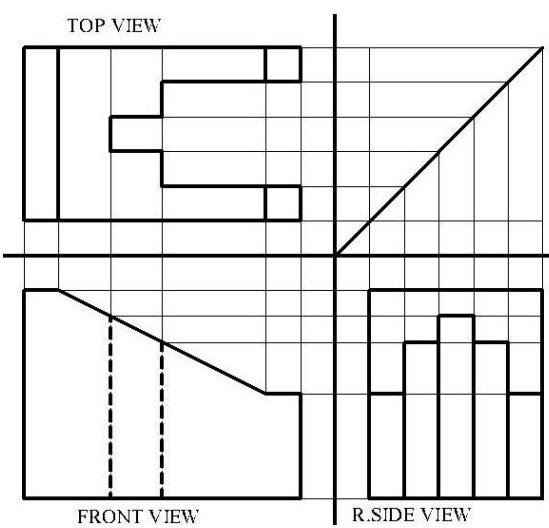
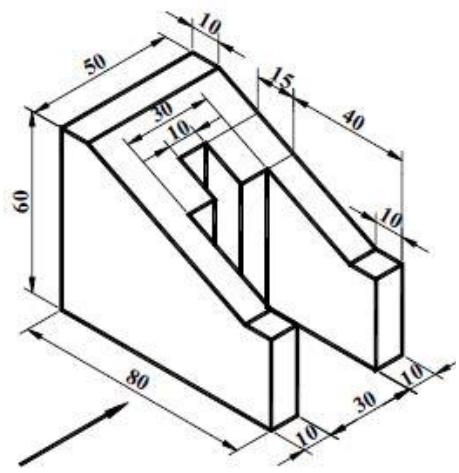
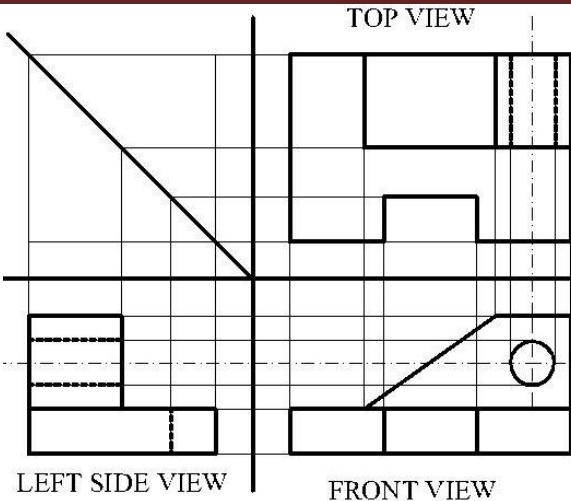
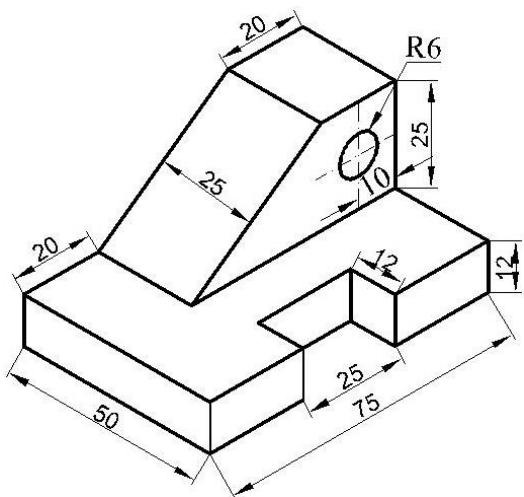


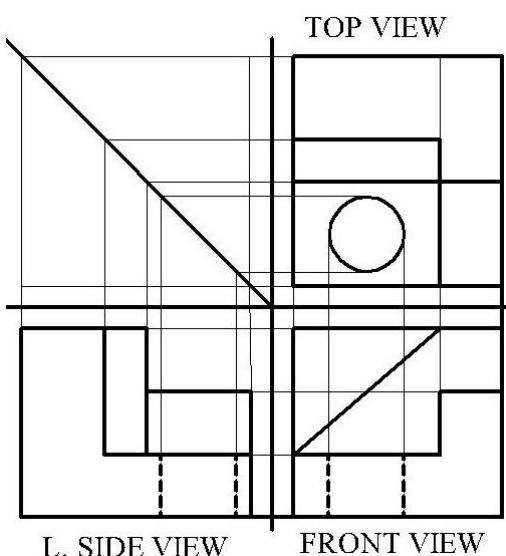
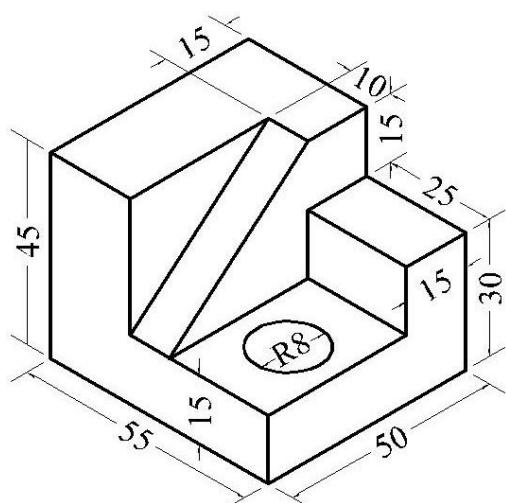
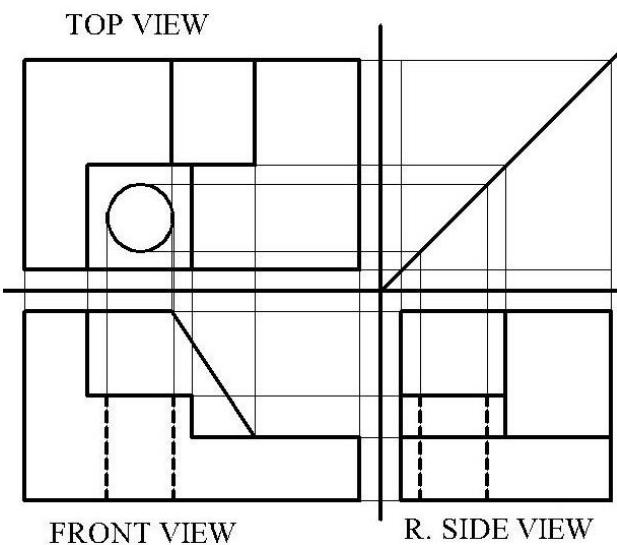
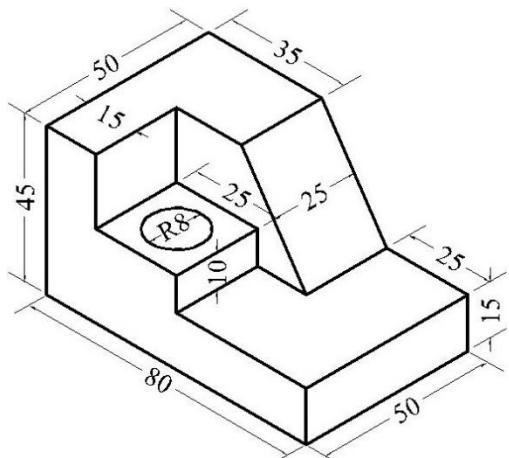
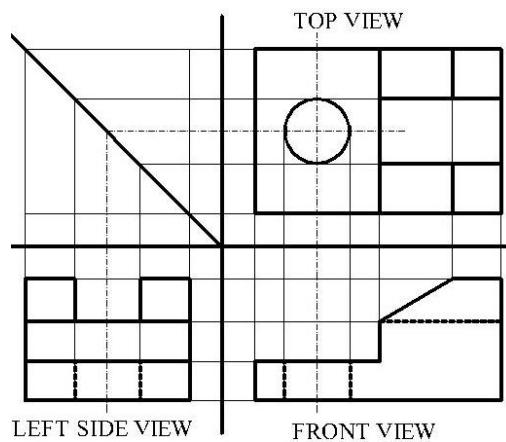
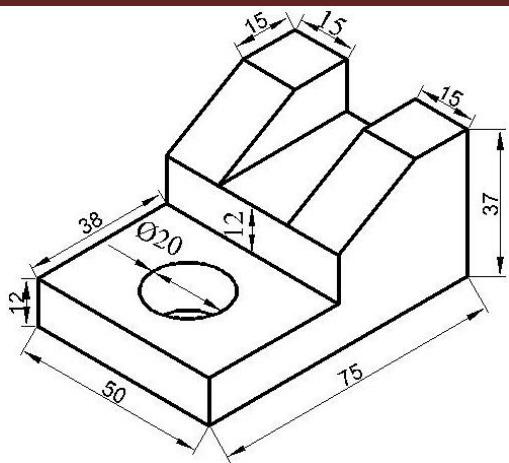


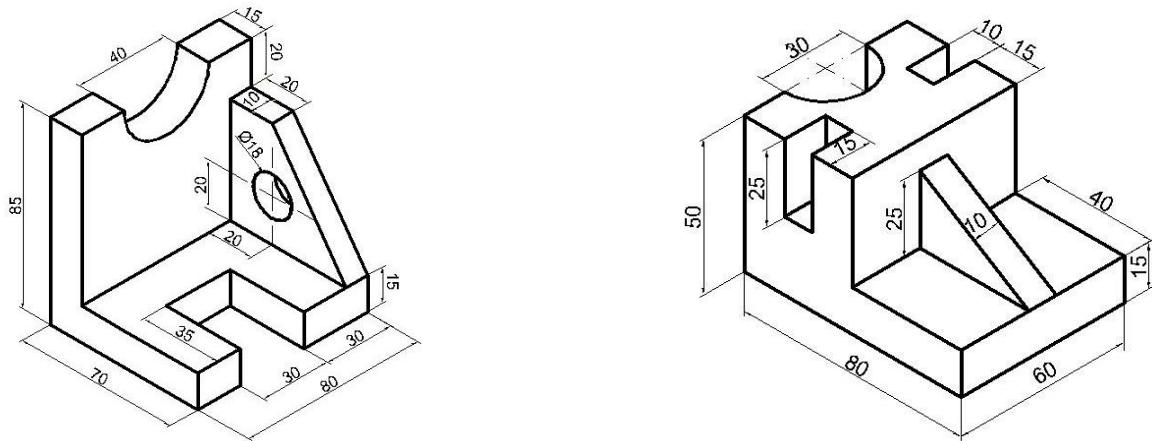
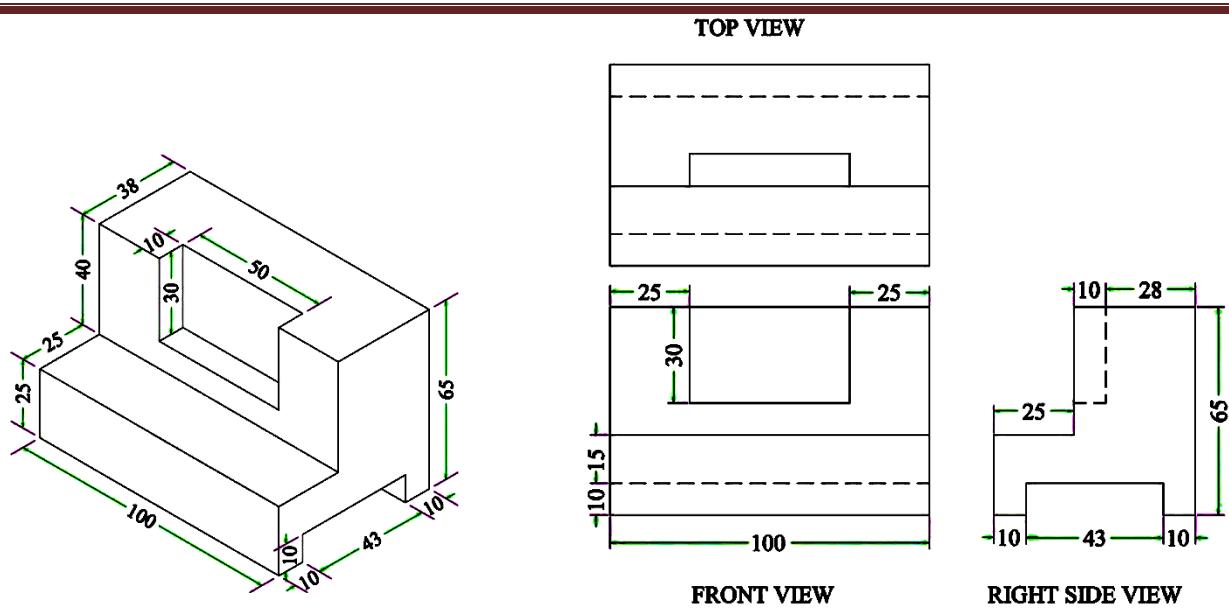






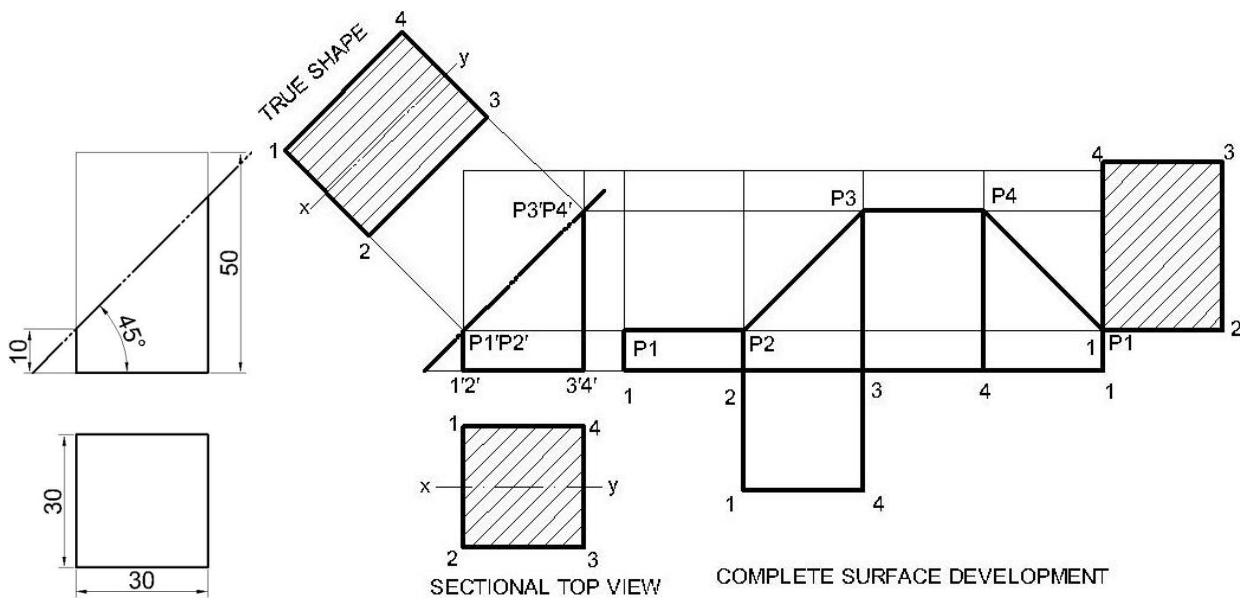
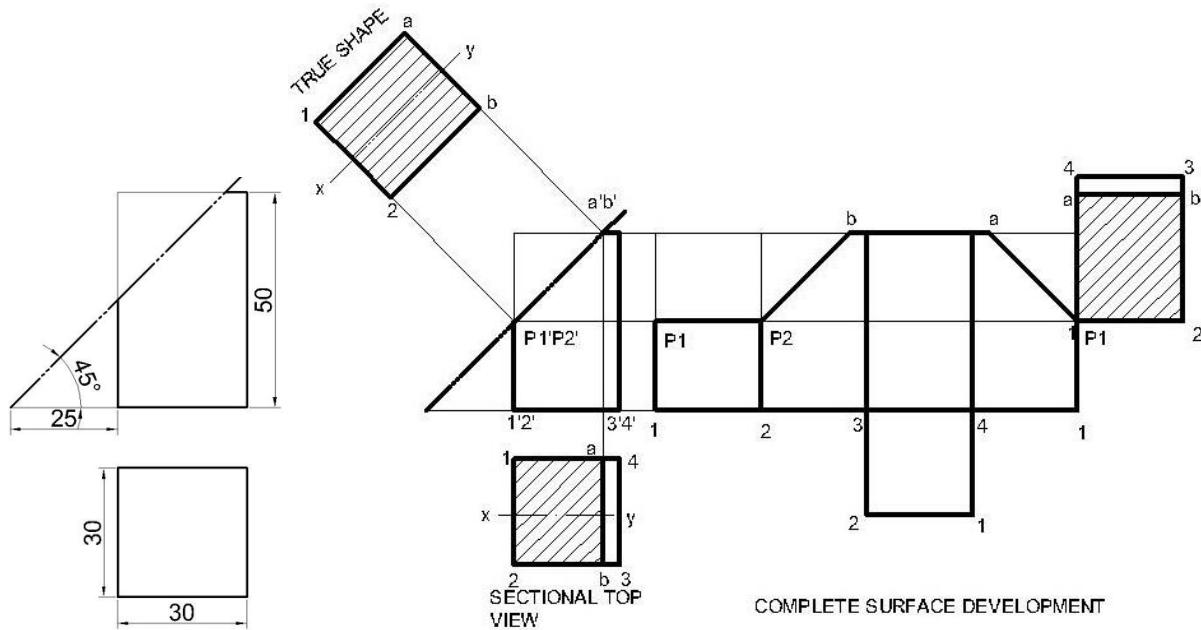


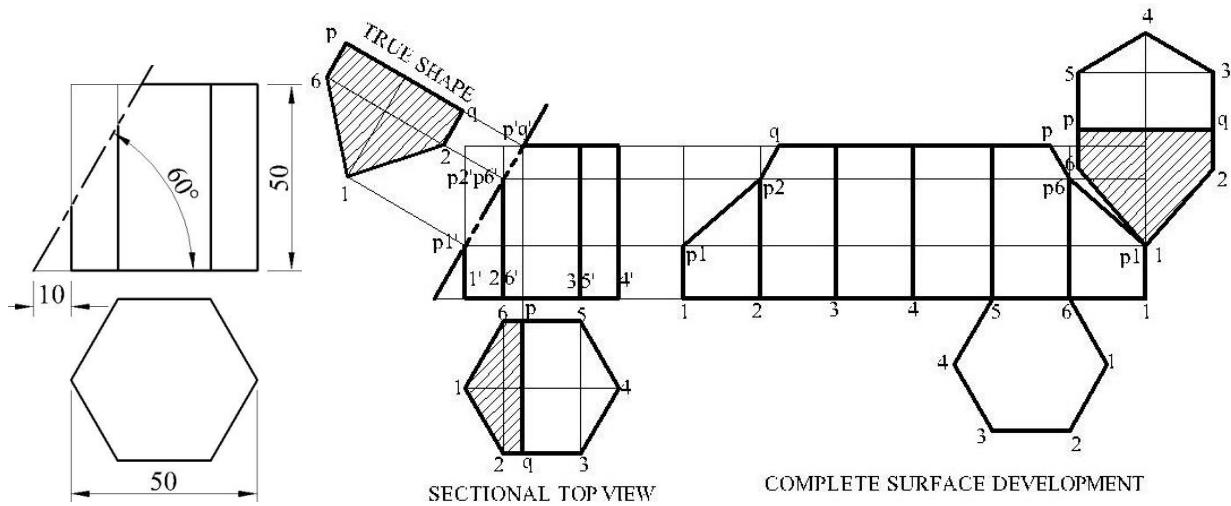
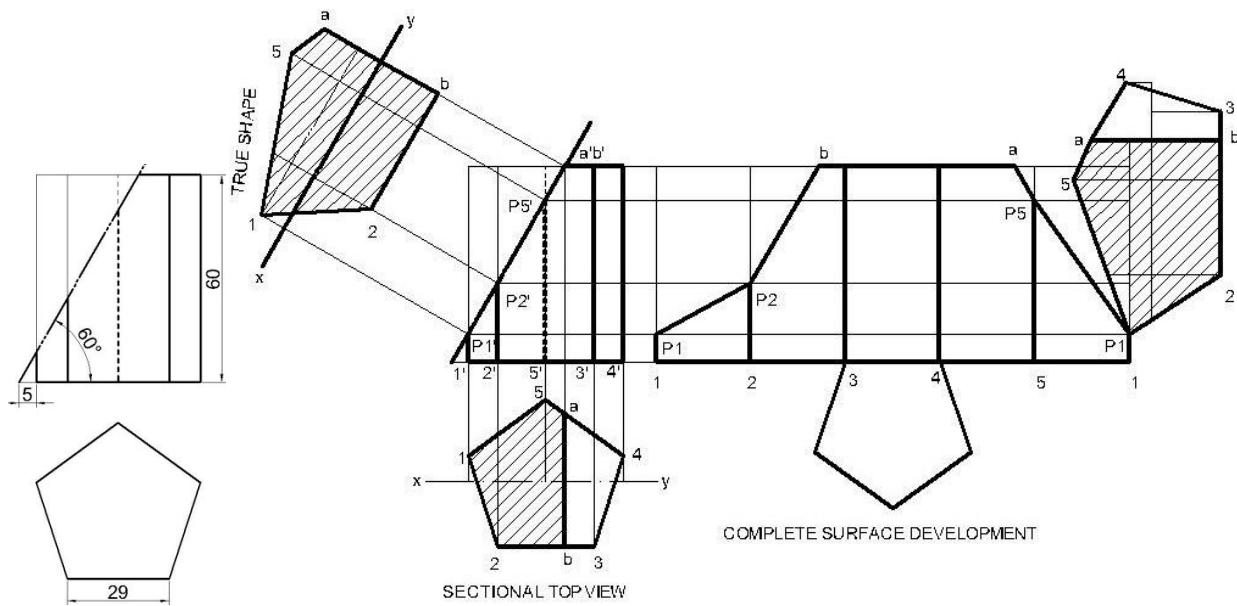
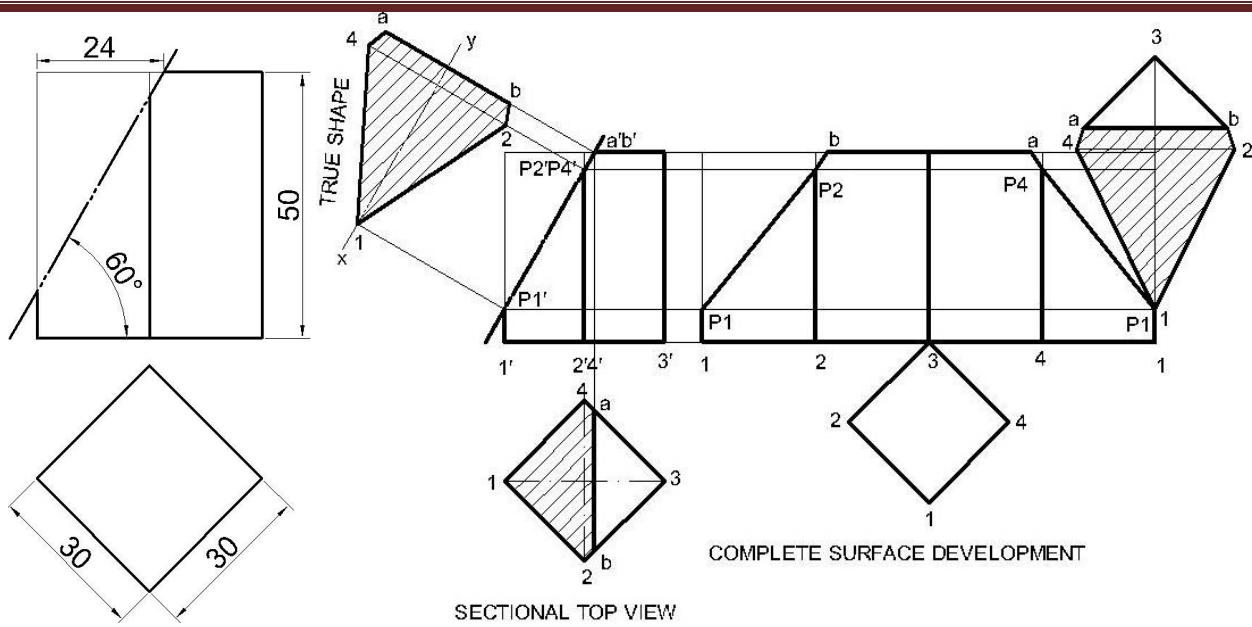


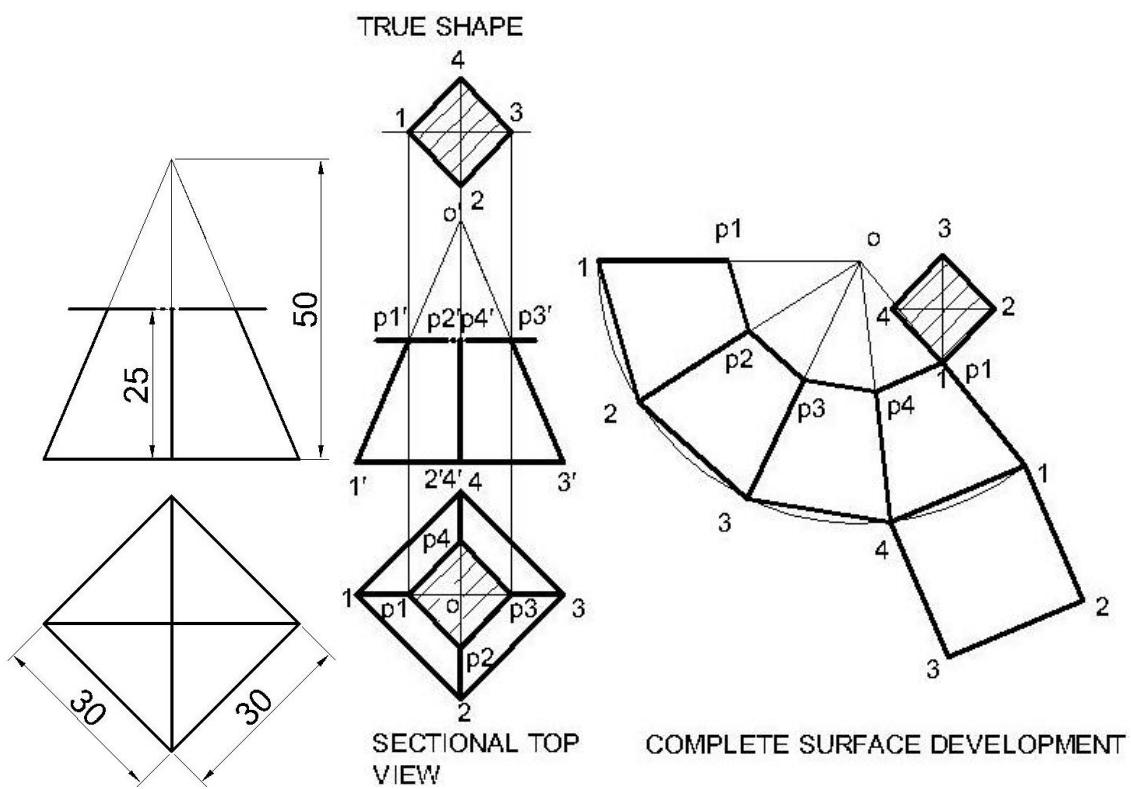
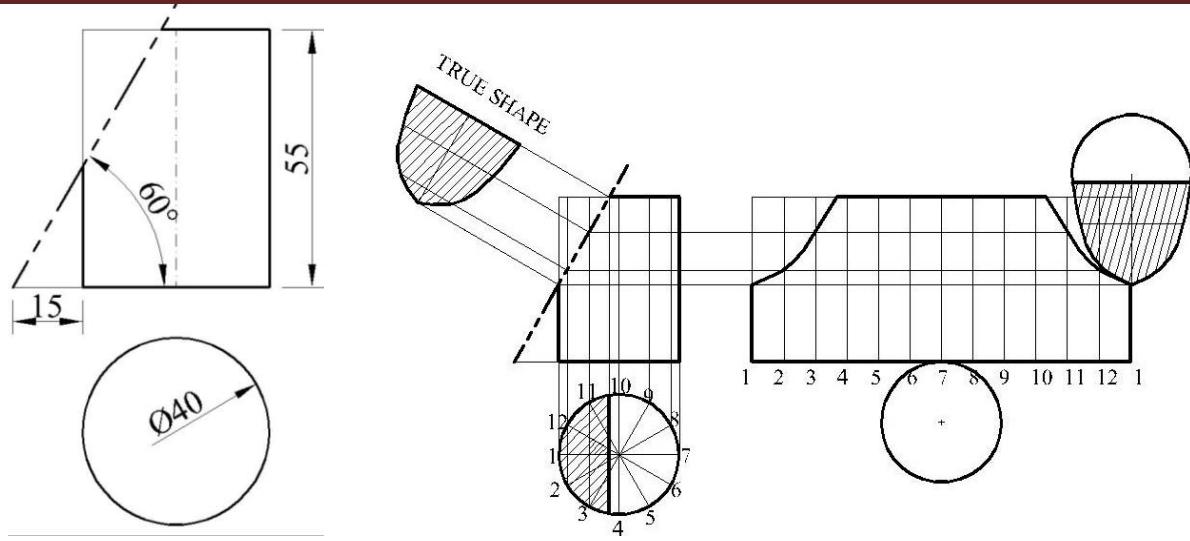


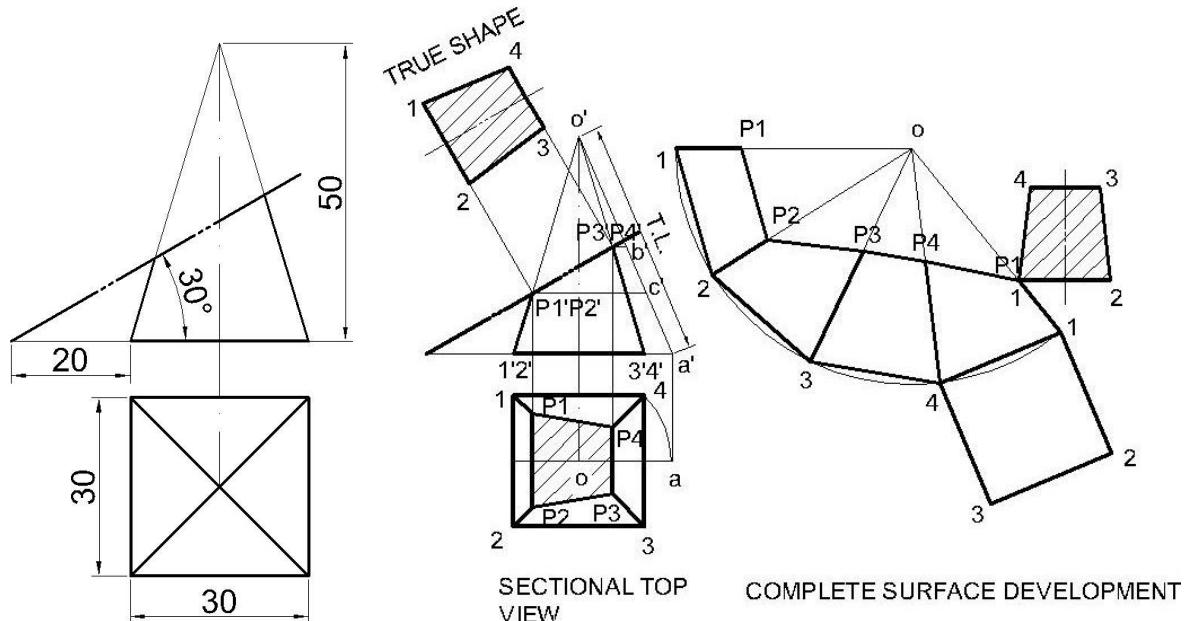
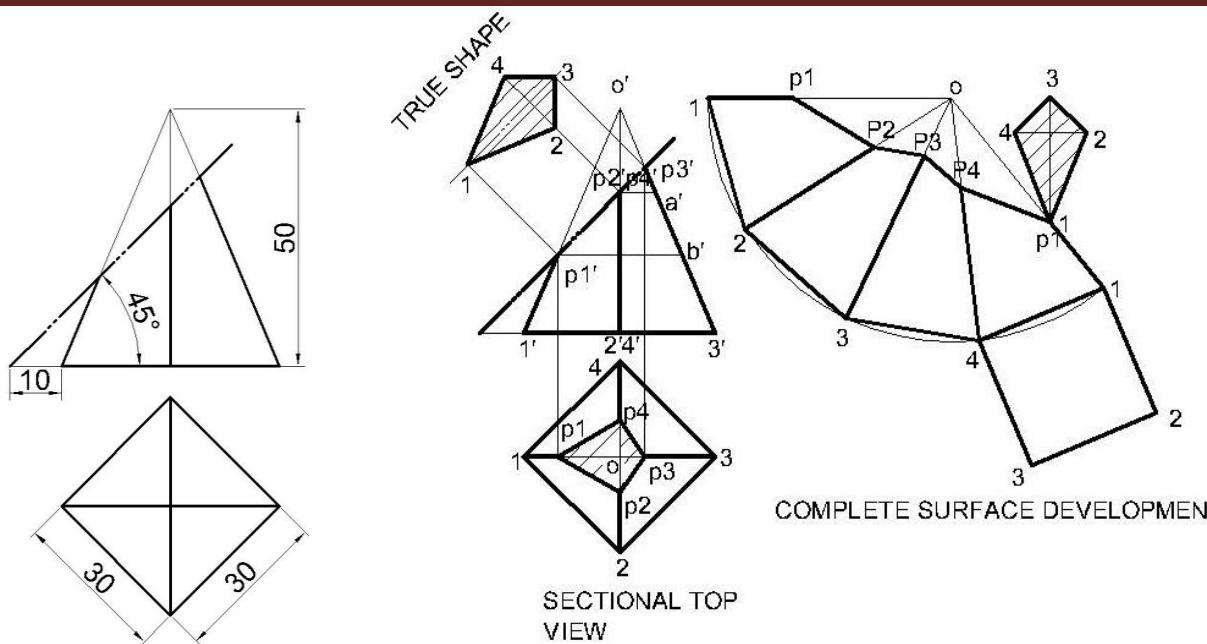
4: SURFACE DEVELOPMENT

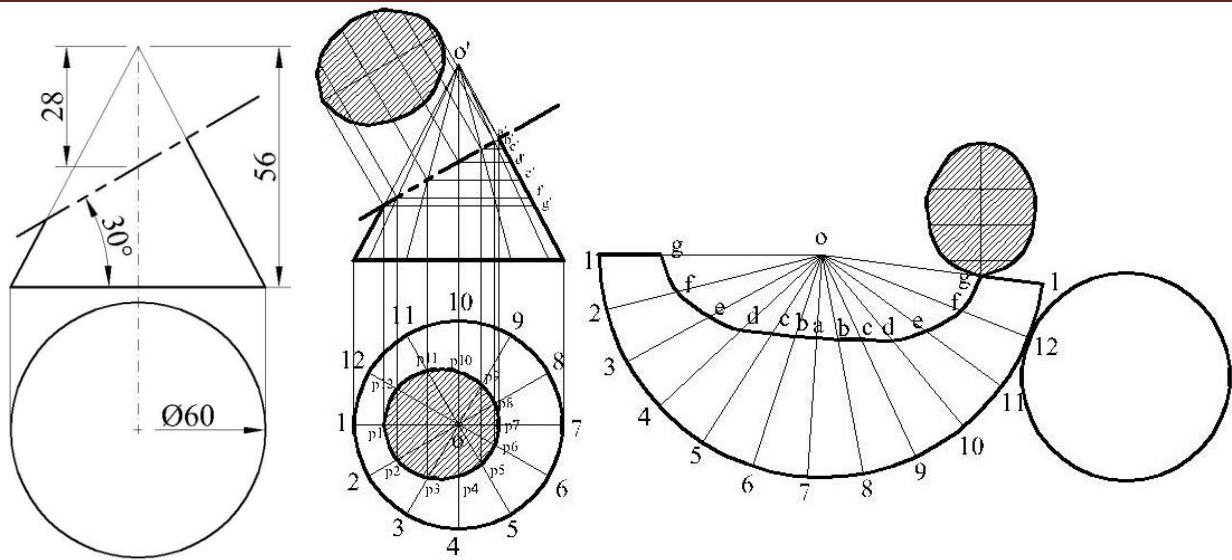
If a cutting plane cuts the given objects in to given position, as shown in figures. Reproduce the given views of the objects and draw complete surface development and also draw the true shape of the section.



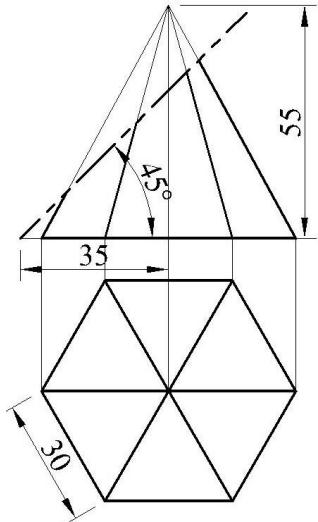




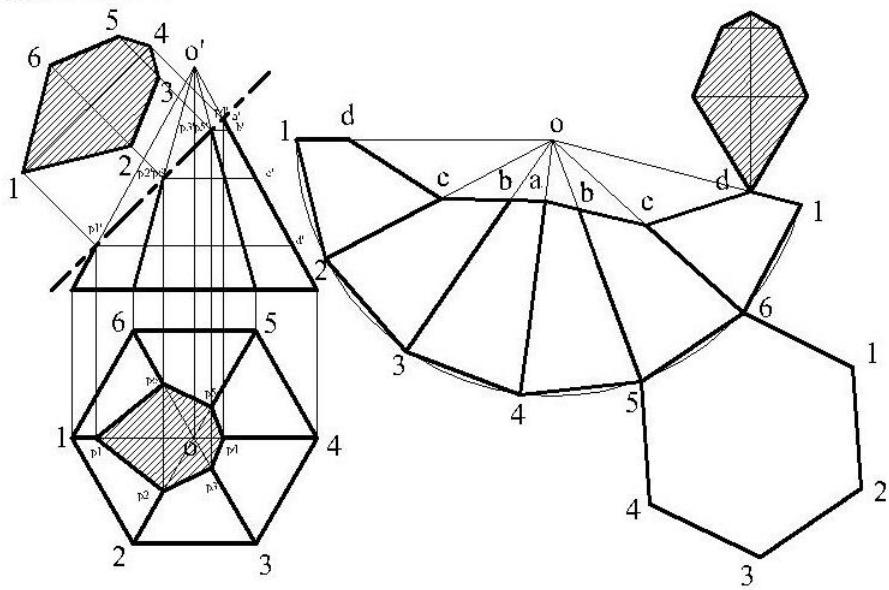




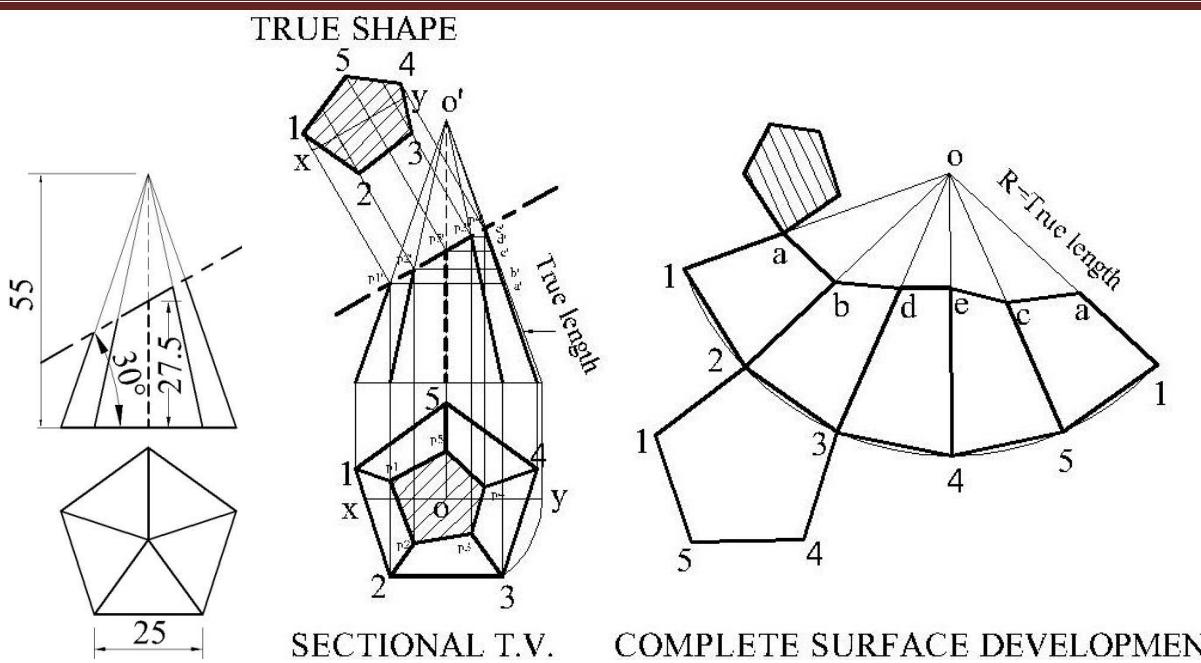
TRUE SHAPE

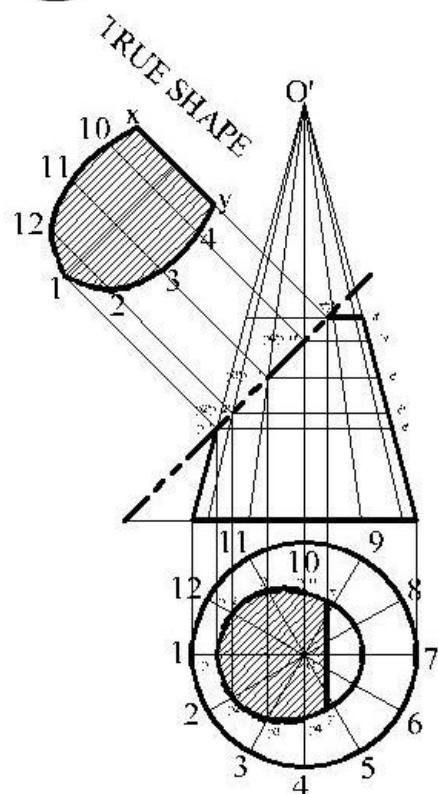
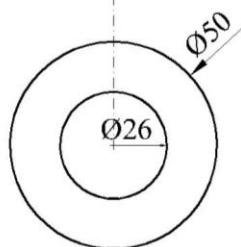
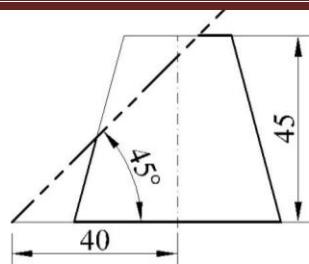


SECTIONAL TOP VIEW

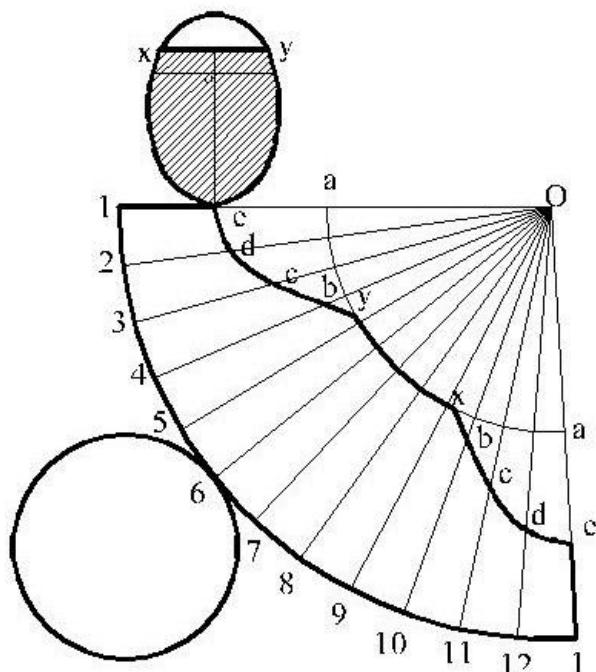


COMPLETE SURFACE DEVELOPMENT

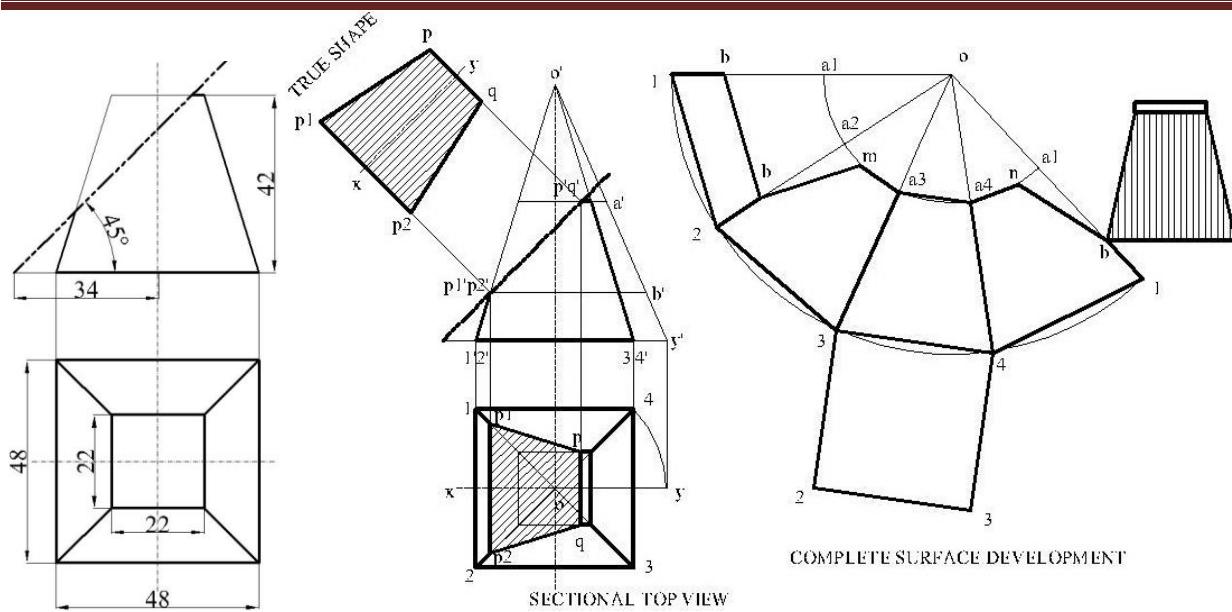




SECTIONAL TOP VIEW



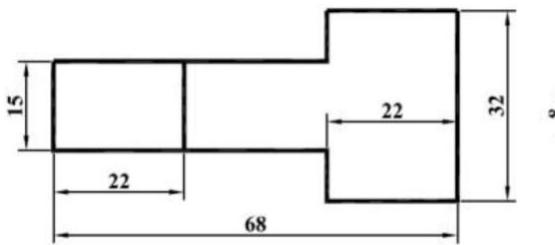
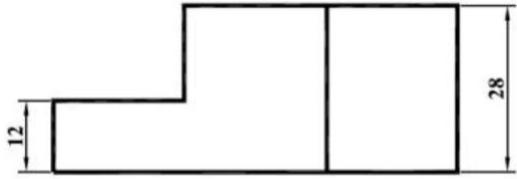
COMPLETE SURFACE DEVELOPMENT



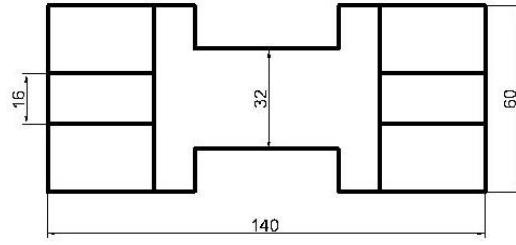
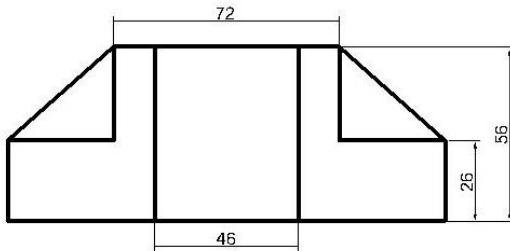
5: PICTORIAL PROJECTION

5.1 Isometric Projection

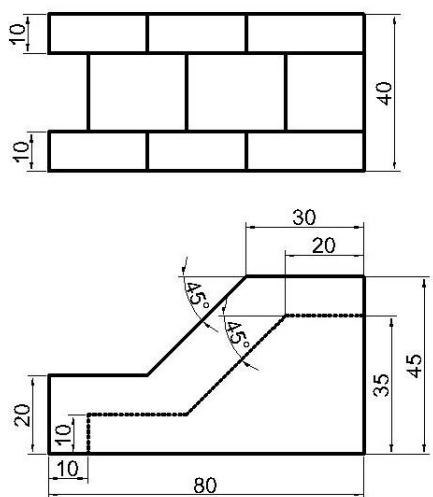
Draw an isometric view from the given orthographic views.



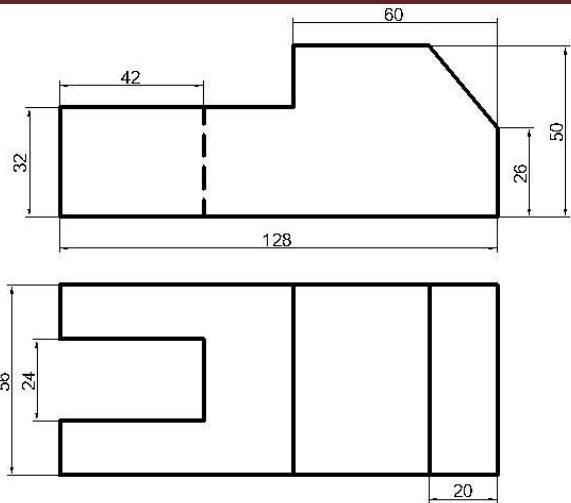
(Figure: 5.1-1)



(Figure: 5.1-2)

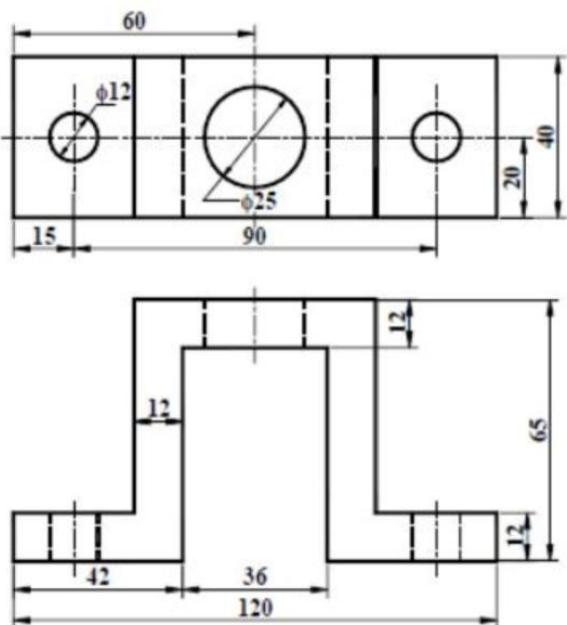


(Figure: 5.1-3)

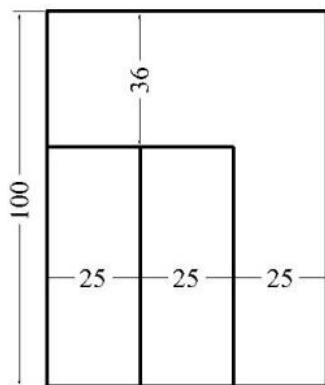


(Figure: 5.1-4)

TOP VIEW

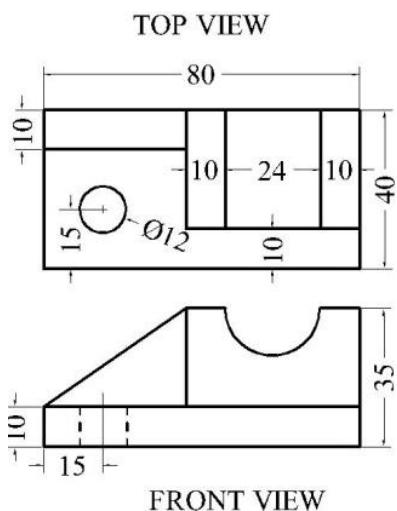


(Figure: 5.1-5)

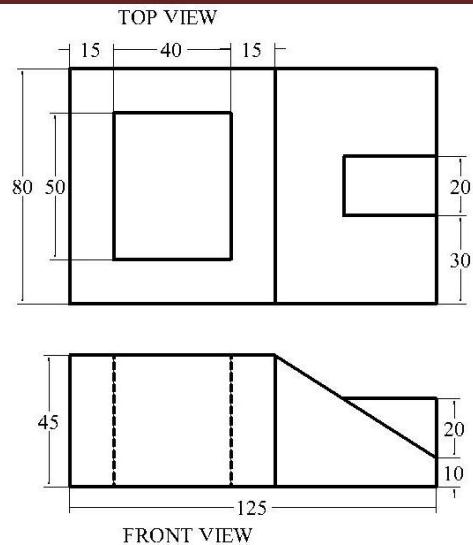


FRONT VIEW

(Figure: 5.1-6)



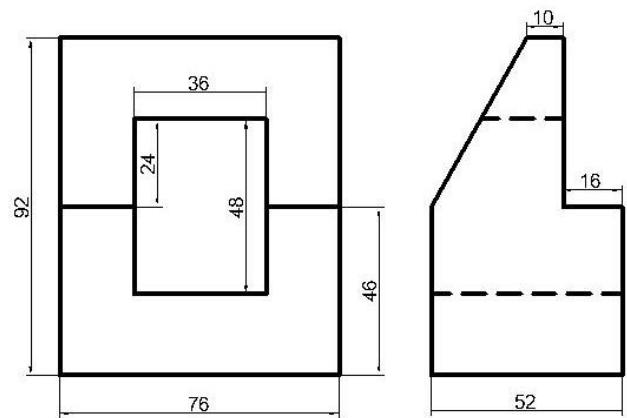
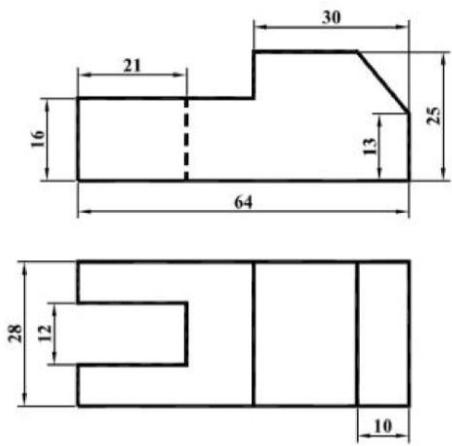
(Figure: 5.1-7)



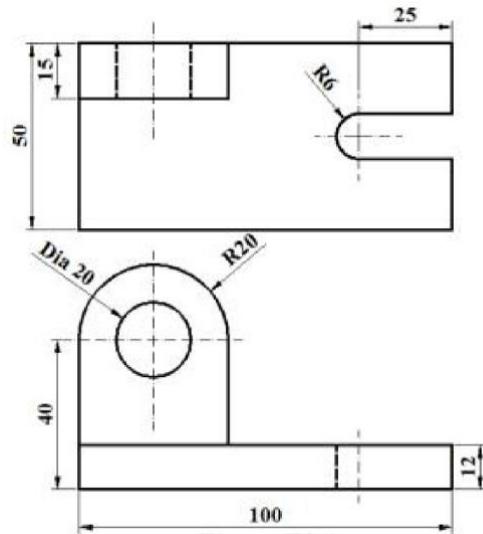
(Figure: 5.1-8)

5.2 Oblique projection

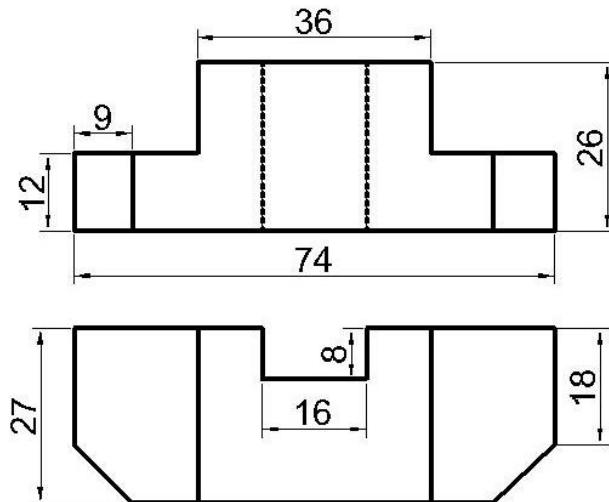
Draw an oblique view from the given orthographic views.



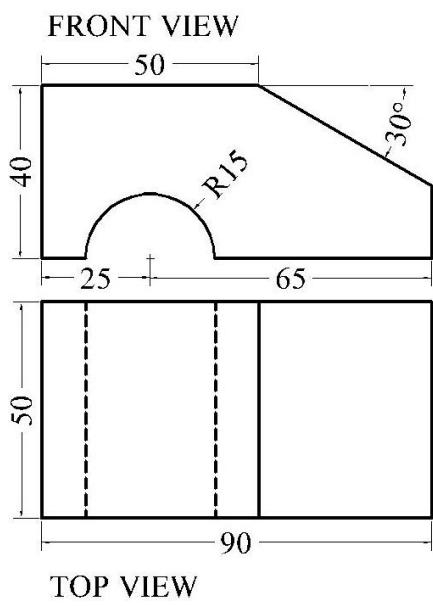
(Figure: 5.2-1)



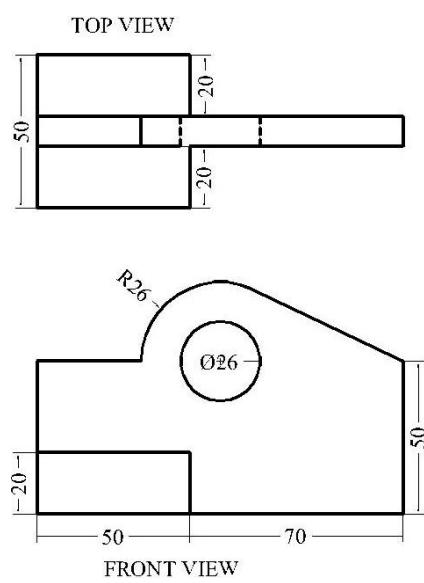
(Figure: 5.2-2)



(Figure: 5.2-3)

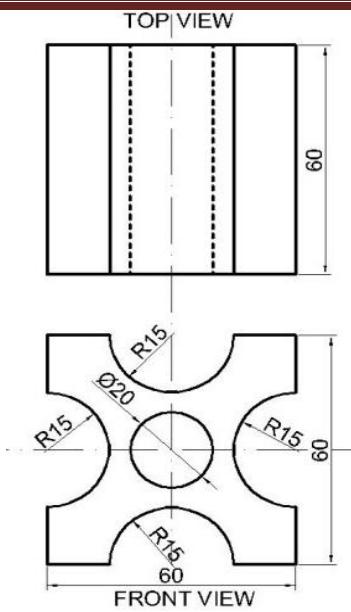


(Figure: 5.2-4)

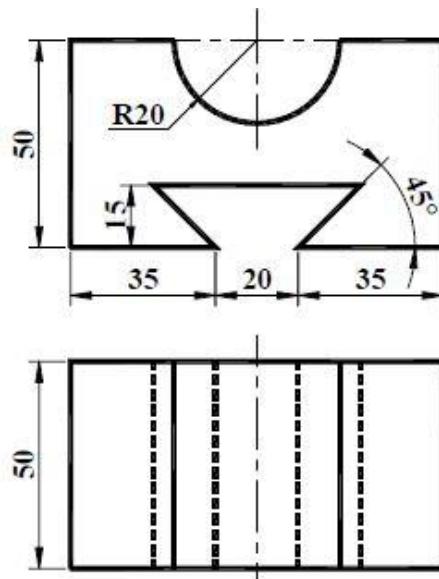


(Figure: 5.2-5)

(Figure: 5.2-6)



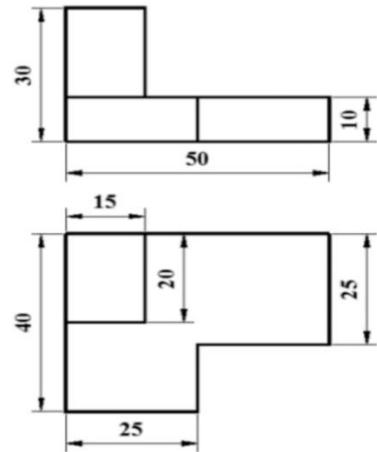
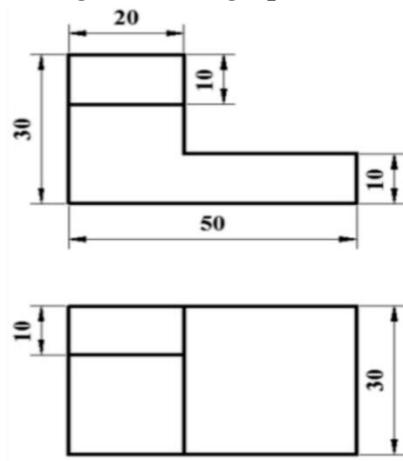
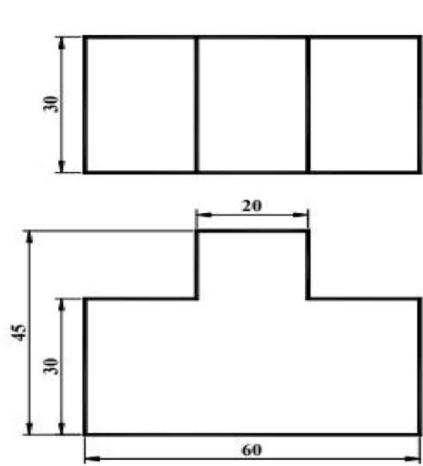
(Figure: 5.2-7)



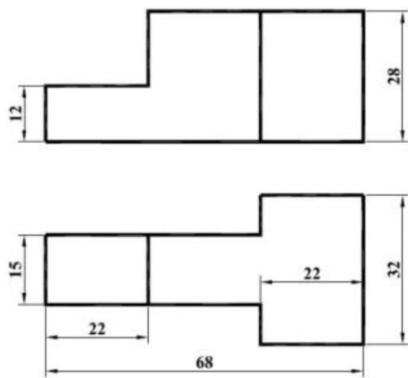
(Figure: 5.2-8)

5.3 Perspective Projection

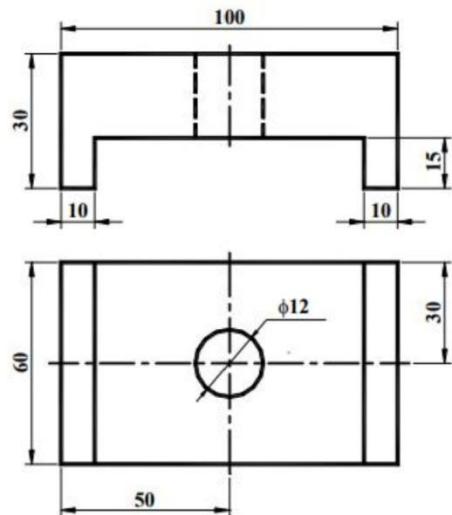
Draw the perspective projection from the given orthographic views.



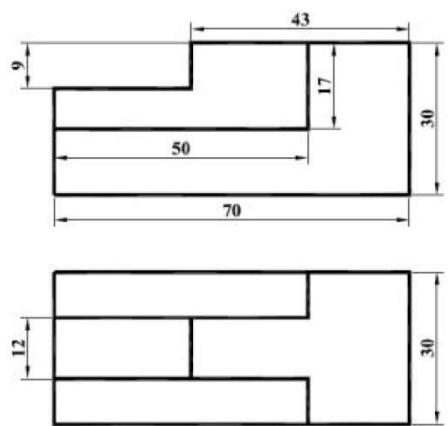
(Figure: 5.3-1)



(Figure: 5.3-2)



(Figure: 5.3-3)



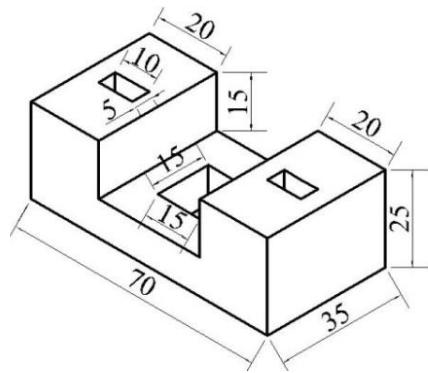
(Figure: 5.3-4)

(Figure: 5.3-5)

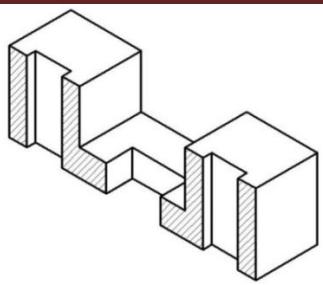
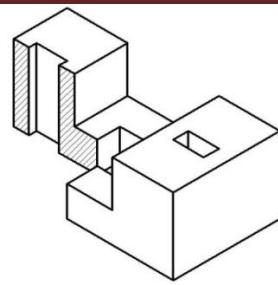
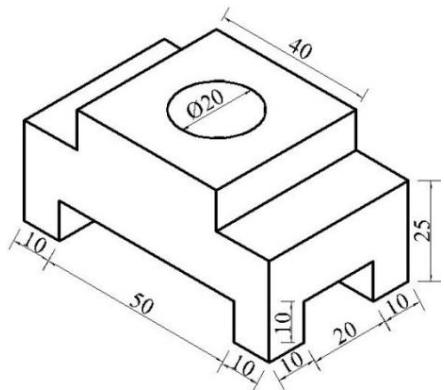
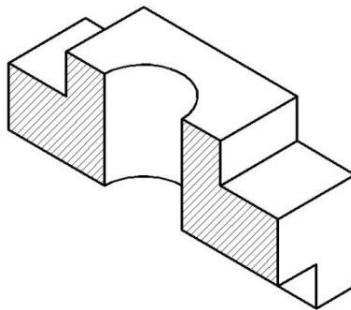
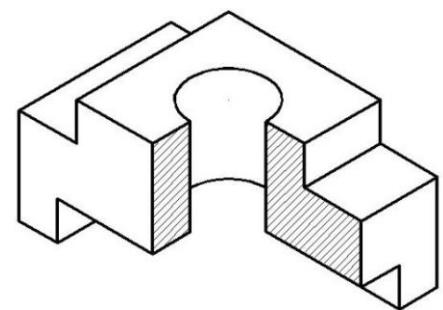
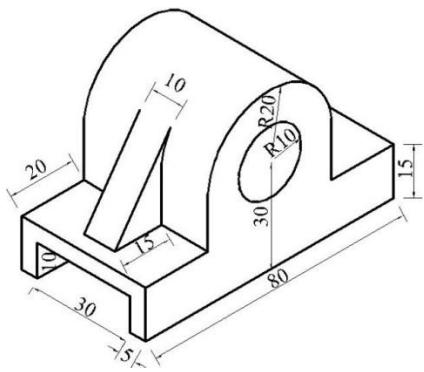
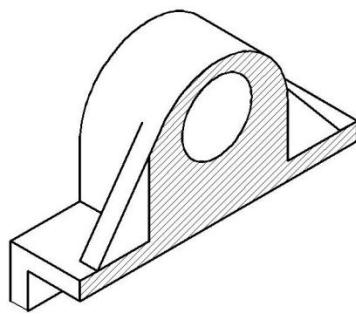
(Figure: 5.3-6)

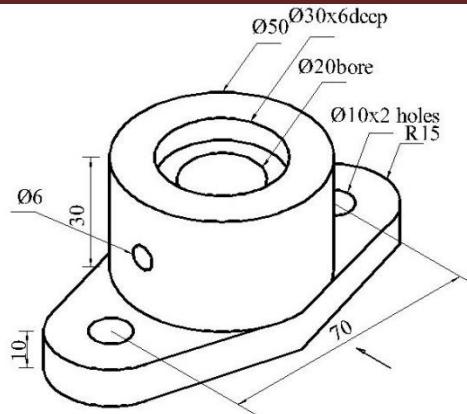
5.4 Sectional Views

Draw Full sectional and Half sectional front view of the given solid figures

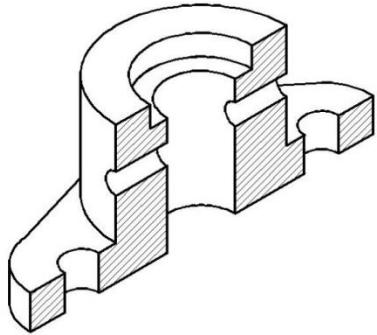


(Figure: 5.4-1)

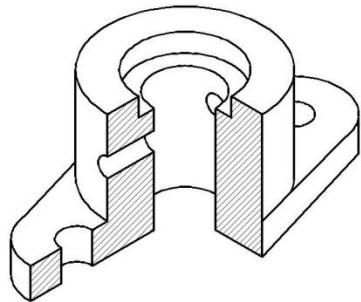
*Full section (Figure: 5.4-1)**Half section (Figure: 5.4-1)**(Figure: 5.4-2)**Full section (Figure: 5.4-2)**Half section (Figure: 5.4-2)**(Figure: 5.4-3)**Full section (Figure: 5.4-3)*



(Figure: 5.4-4)



Full section (Figure: 5.4-4)



Half section (Figure: 5.5-4)

6:GRAPHICAL SYMBOLS

Sketch free hand the graphical symbols for the following Engineering items.

Electronics and Electrical

Amplifier		Antenna		Arrester		Battery	
Circuit Breaker		Capacitor		Coil		Connector	
Electric Contact		Core		Fuse		Directional Coupler	
Ground		Handset		Rectifier		Visual Signaling device	
Receiver		Repeater		Ground		Handset	
Thermocouple		Inductor Winding		Incandescent Lamp		Ballast Lamp	
Transformer		Switch		Resistor		Transmission Path	
Generator		Motor		Solenoid		Thermostat	
Thermistor		Variable Resistor		Voltmeter		NPN-type Transistor	
PNP-type Transistor		Direct Current		Alternating Current		Power Frequency	
Apparatus & Machine suitable for DC or AC		Half-wave Rectifier		Line or Cable existing		Line or Cable planned	
Controlled Rectifier		Power Line		Underground Cable		Overhead Line	

Electronics and Electrical

Conductors or a group of Conductors		Flexible Conductors		Two Conductors		Three Conductors	
Four Conductors		Junction of Conductors		Crossing without Electrical Connection		Crossing and Connecting Conductors	
Frame and Chassis Connection		Fault		Fault to Frame		Earth Fault	
Mechanically Coupled Machine		DC Generator		AC Generator		DC Motor	
AC Motor Single Phase		Three Phase Motor		Three Phase Motor in Delta Connection		One Way Switch (Single Pole Switch)	
Two Pole Switch		Three Pole Switch		Two Way Switch		Intermediate Switch	
Push Button Switch		Socket Outlets		Socket Outlets, 5A		Socket Outlets, 5A with Switch	
Socket Outlets, 15A with Switch		Lamp mounted on ceiling		Group of 3, 40 Watt Lamp		Lamp mounted on wall	
Fluorescent Lamp		Ceiling Fan		Wall mounted Fan		Exhaust Fan	
Fan Regulator		Bell		Pickup		Buzzer	
Siren		Public addressing System		Diode with Filament		Telephone- Telegraph Line	

