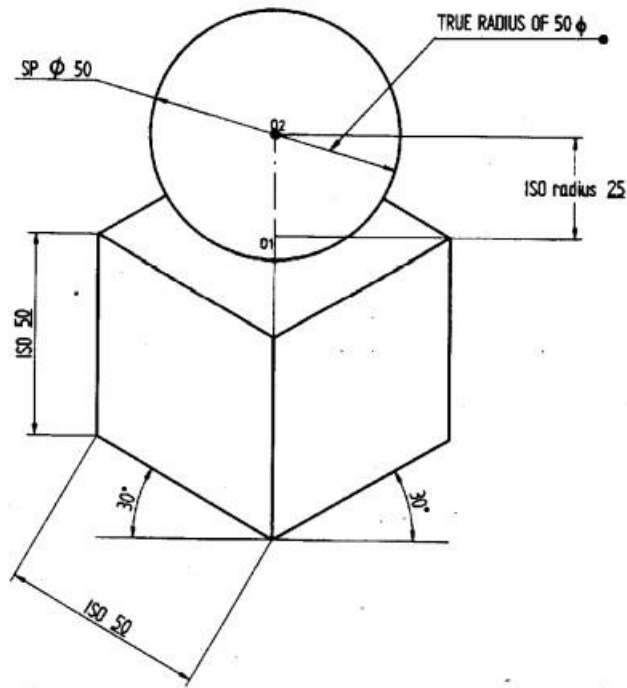


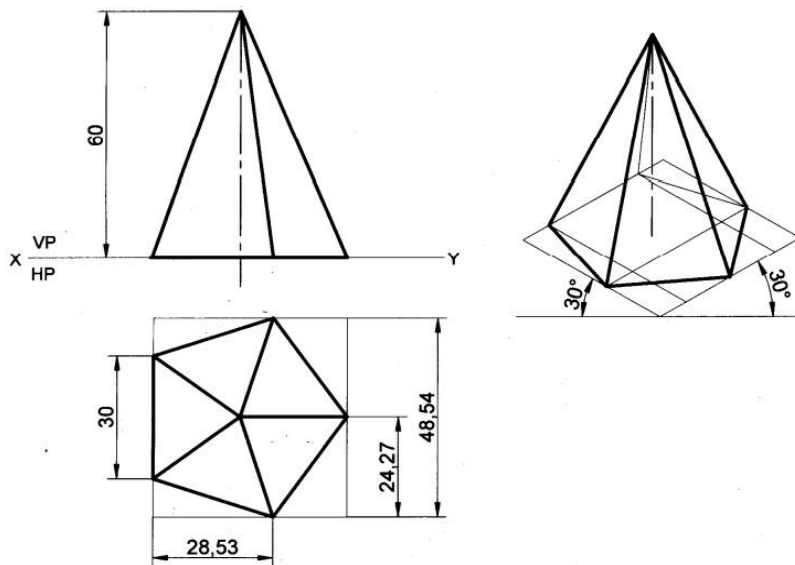
Unit-4

Isometric Projection

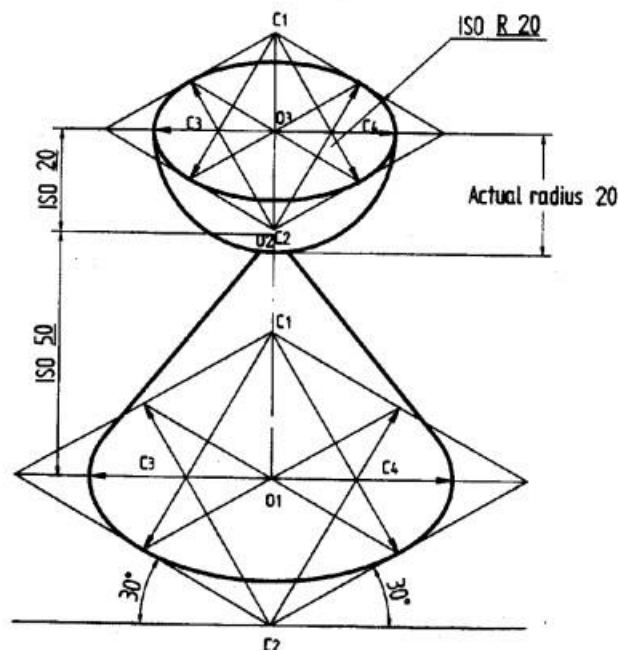
1. A sphere of diameter 50 mm rests centrally on top of a cube of sides 50 mm. Draw the Isometric projections of the combination of solids.



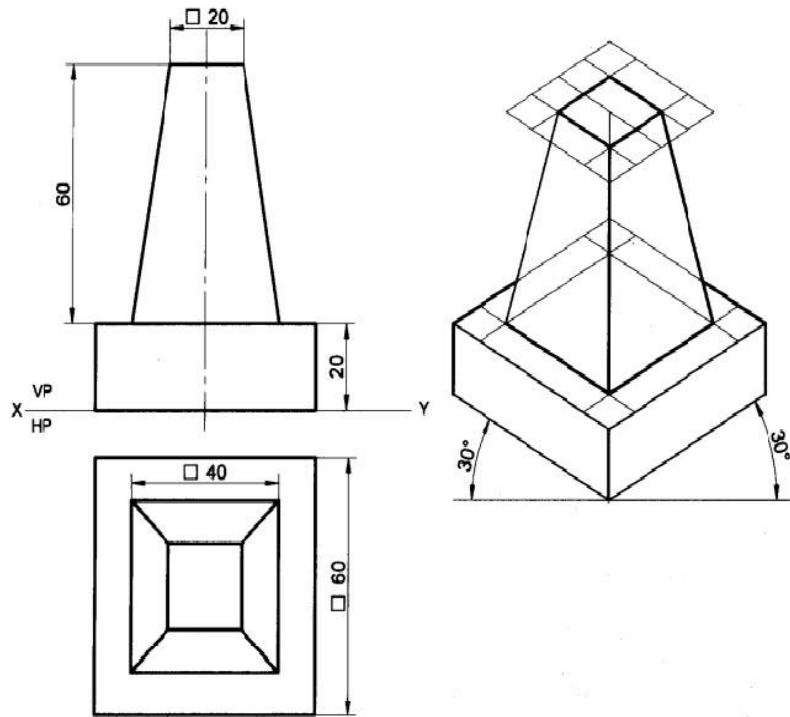
2. A pentagonal pyramid of base side 30 mm and axis length 60 mm is resting on HP on its base with a side of base perpendicular to VP. Draw its isometric projections.



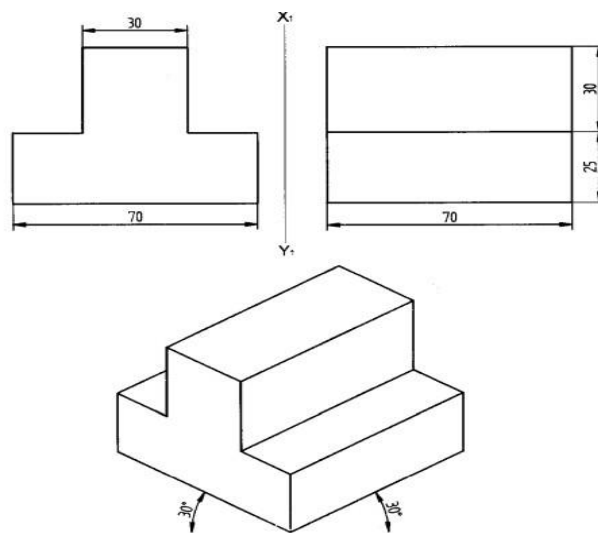
3. A hemisphere of 40 mm diameter is supported co-axially on the vertex of a cone of base diameter 60 mm and axis length 50 mm. The flat circular face of the hemisphere is facing upside. Draw the isometric projection of the combination of solids.



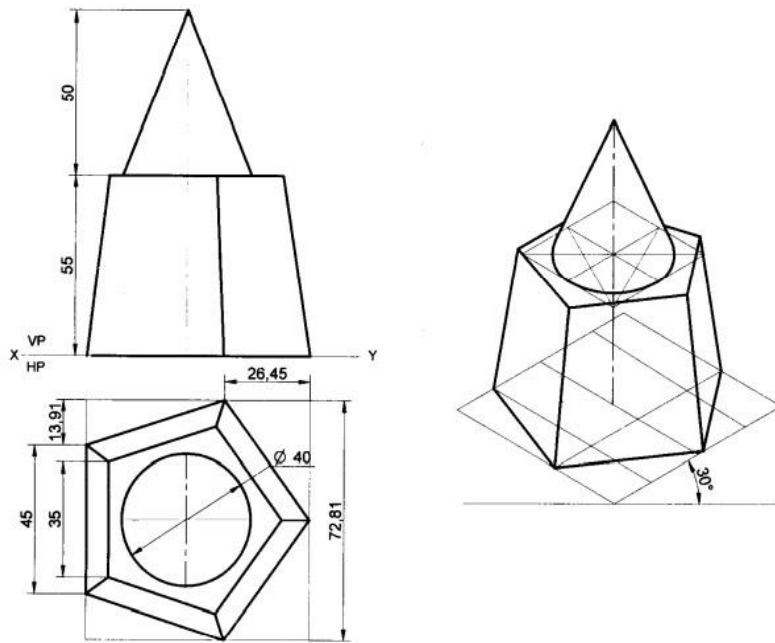
4. The frustum of a square pyramid of base 40 mm, top face 20 mm and height 60 mm rest on the centre of the top of a square block of sides 60 mm and height 20 mm. The base edges of the pyramid are parallel to the top edges of the square block. Draw the isometric projection of the combination of the solids.



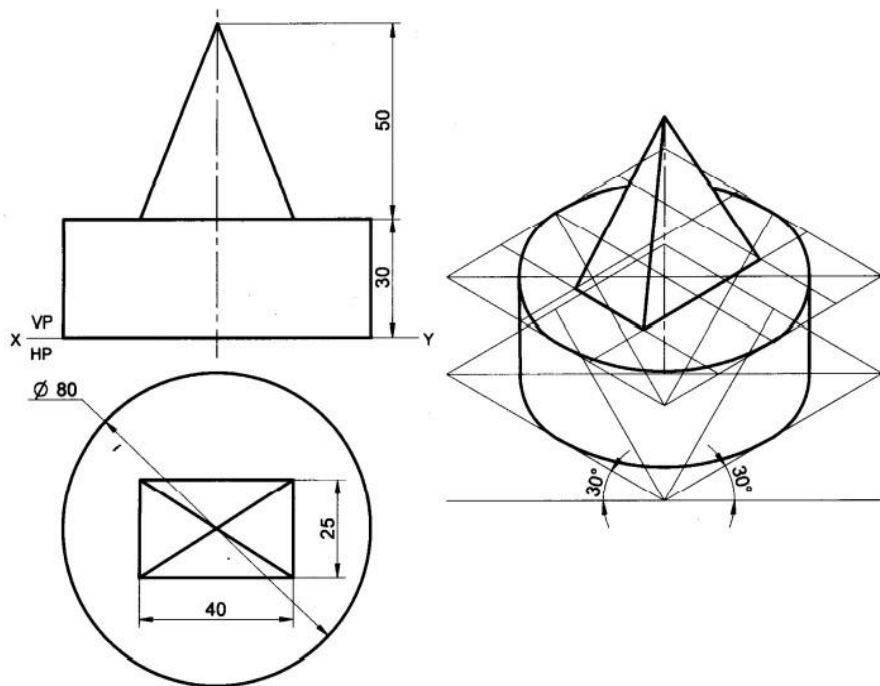
5. A square prism of base side - 30 mm and length - 70 mm is resting on its rectangular face on top of a square slab side - 70 mm and 25 mm thick. Draw the isometric projection of the combination.



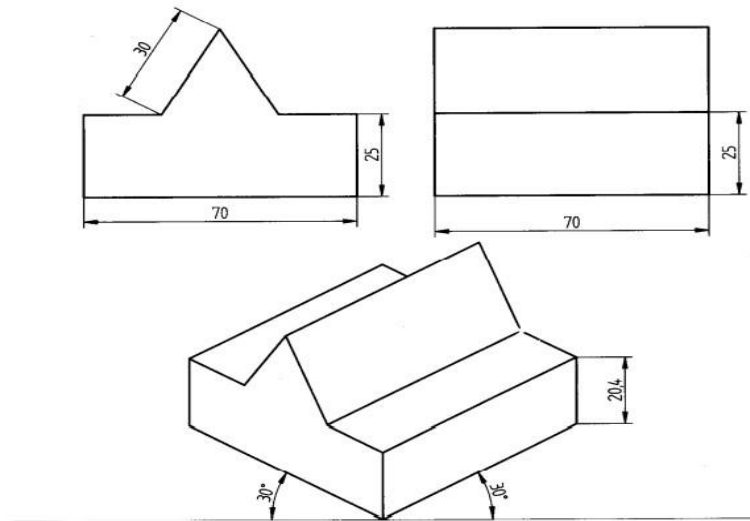
6. A cone of base diameter 40 mm and height 50 mm rests centrally over a frustum of a pentagonal pyramid of base side 45 mm and top side 35 mm and height 55 mm. Draw the isometric projections of the solids.



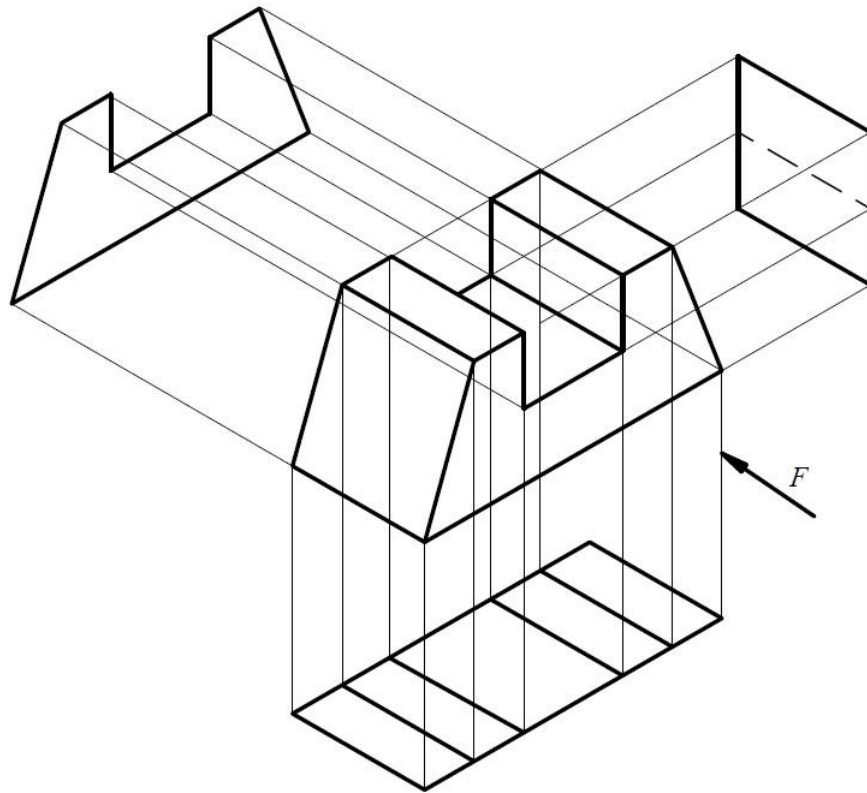
7. A rectangular pyramid of base - 40 mm x 25 mm and height 50 mm is placed centrally on a cylindrical slab of diameter 100 mm and thickness - 30 mm. Draw the isometric projection of the combination.



8. A triangular prism base side 30 mm and length - 70 mm is resting on its rectangular face on top of a square slab side - 70 mm and 25 mm thick. Draw the isometric projection of the combination.

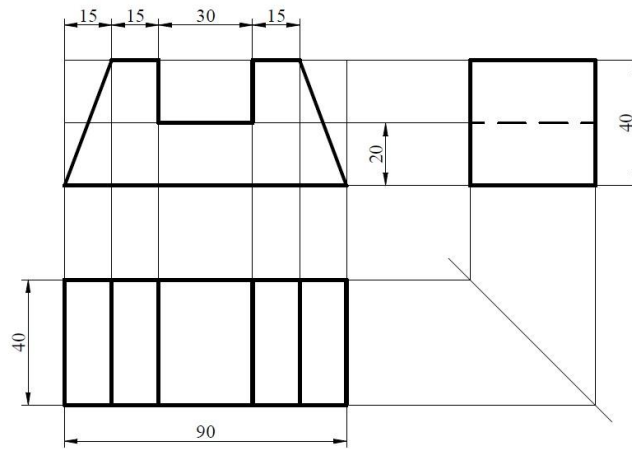
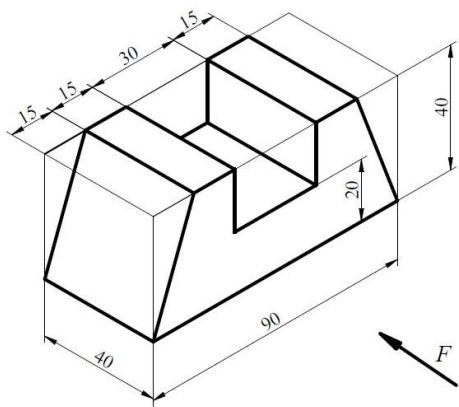


Conversion of isometric drawings into orthographic views

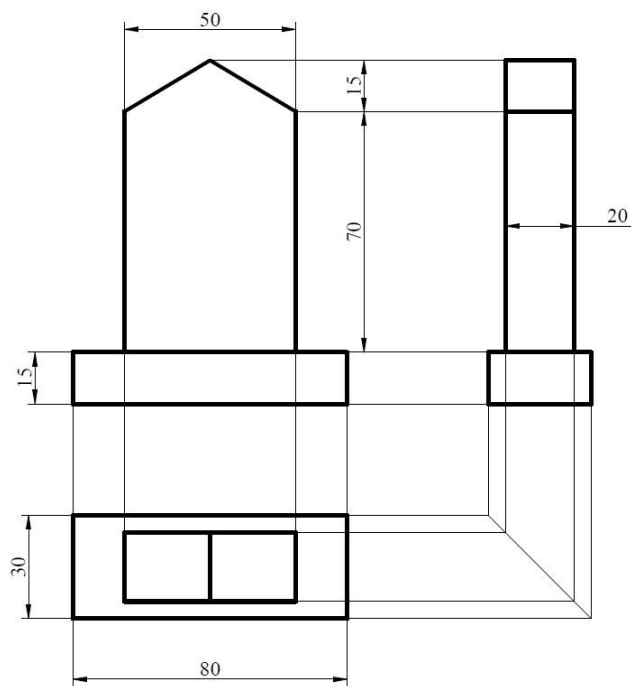
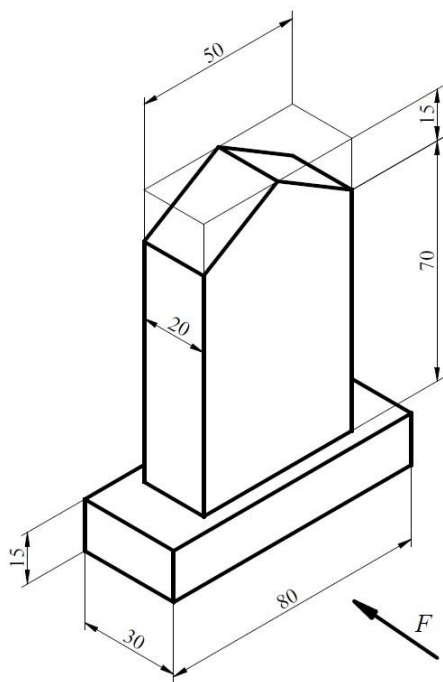


Draw the front view, top view and a side view of the components shown in the following figures. 'F' indicates the direction of front view.

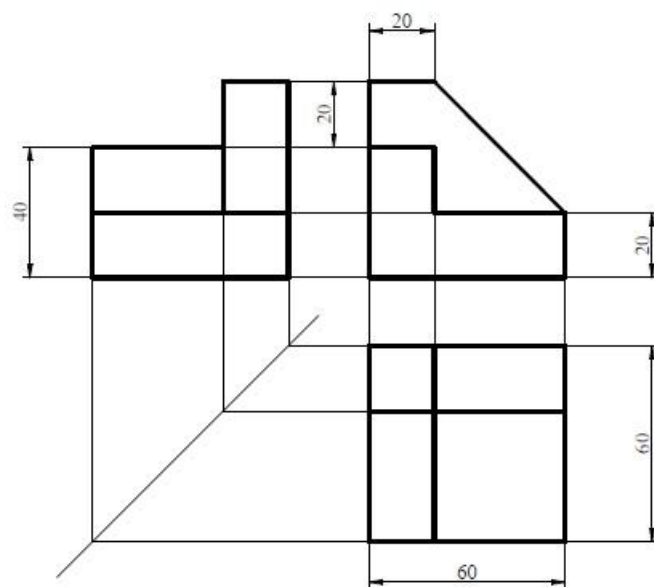
1.



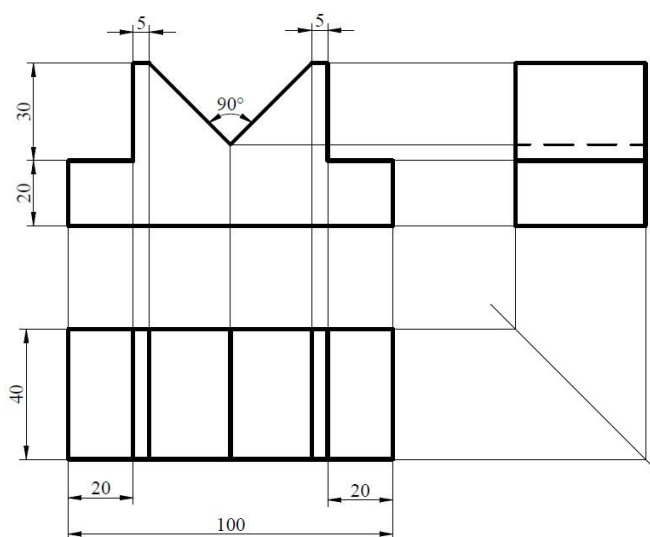
2.



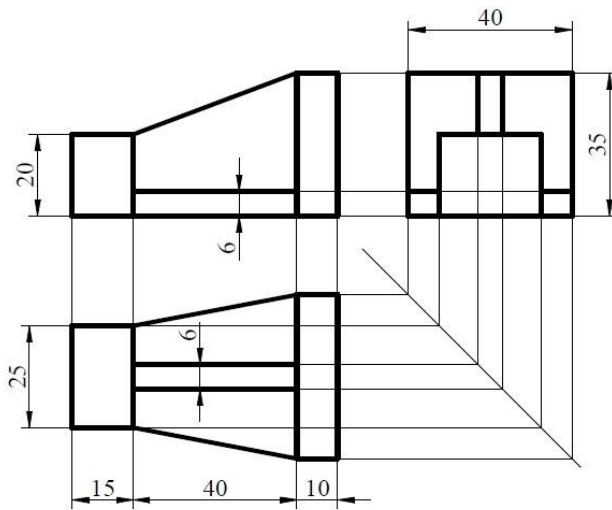
3.



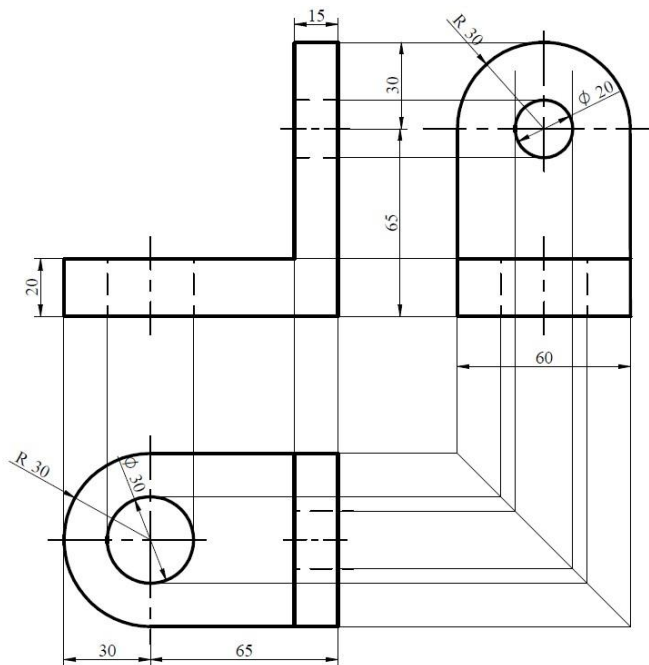
4.



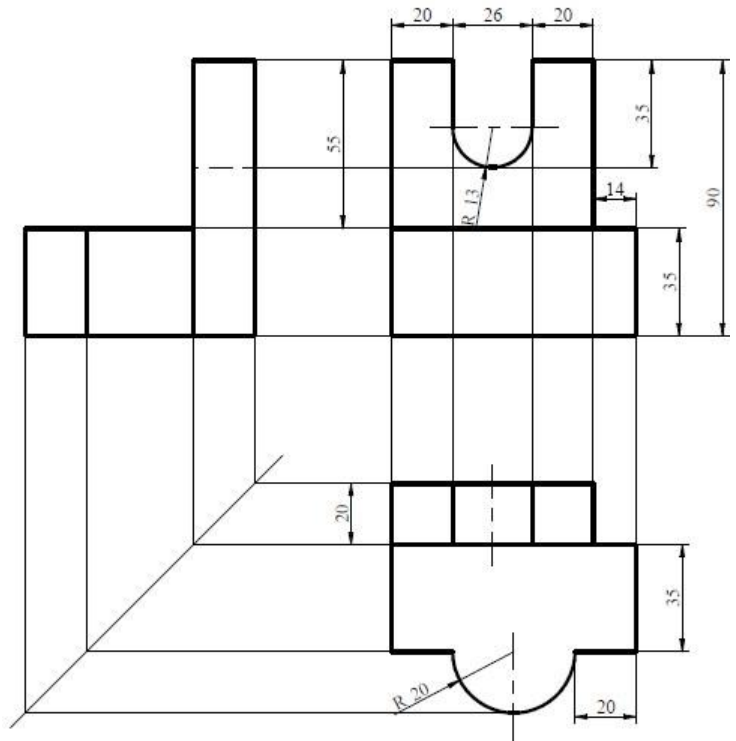
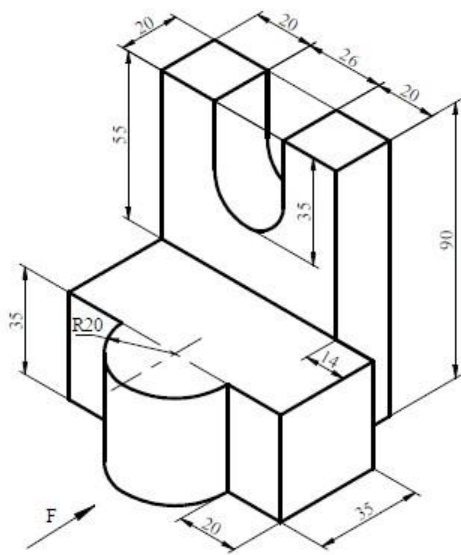
5.



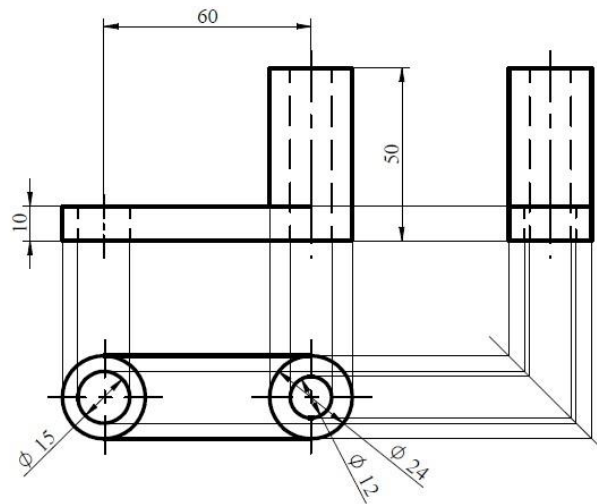
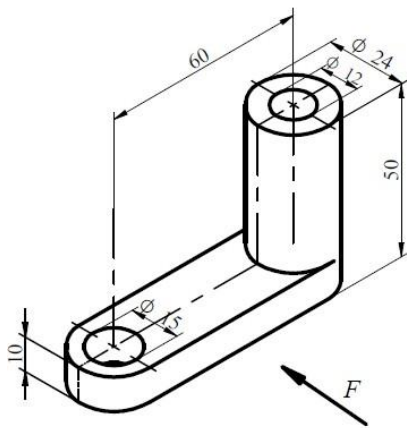
Isometric view of the mechanical part. Dimensions are given in mm. The part has a base plate with a width of 60 mm and a depth of 65 mm. The base plate has a rounded front edge with a radius of $R30$ and a central circular hole with a diameter of $\Phi30$. The base plate is 20 mm thick. A vertical plate is attached to the base plate, with a height of 65 mm and a width of 30 mm. The vertical plate has a rounded top edge with a radius of $R30$ and a central circular hole with a diameter of $\Phi20$. The vertical plate is 15 mm thick. A force vector F is applied to the right side of the vertical plate, pointing downwards and to the right.



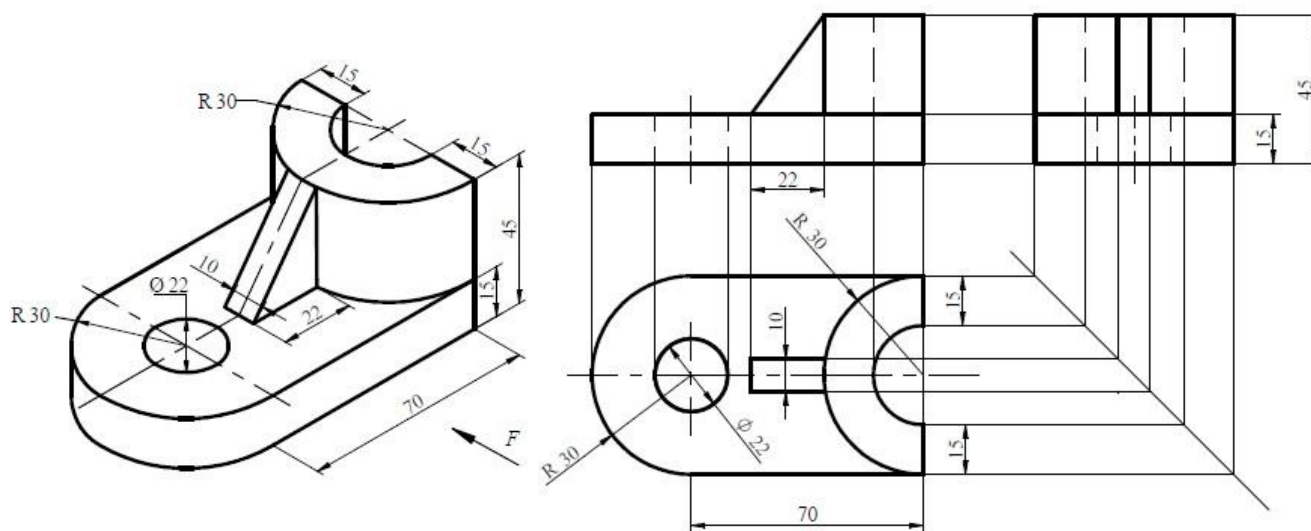
7.



8.



9.



Unit 5

1BCEDS103/203 (CS STREAM)

Computer Network Drawing (For CIE Only):

2D Network drawing with wired and wireless, Network topology - wired and wireless.

3D Modeling: Raspberry Pi / Arduino boards, Router & switches, IoT devices - Concept of converting to 3D printing format (stl) Concept of Industrial drawing

Web links and Video Lectures (e-Resources):

- <https://nptel.ac.in/courses/112104172> • <https://nptel.ac.in/courses/112102304>
- <https://nptel.ac.in/courses/112105294>
- <https://www.coursera.org/courses?query=3d%20modeling&utm>
- <https://www.youtube.com/watch?v=zbqrNg4C98U>

1BCEDC103/203 (CV STREAM)

Building Components Drafting (For CIE Only):

Modeling Basic Building Components: foundations, columns, beams, slabs, walls, doors windows, staircase, assigning materials and rendering building components.

Drafting a 2D floor plan for a simple single-storey residential/commercial building, Converting the floor plan into 3D model with walls, openings, and roof structure. Concept of building drawing

Web links and Video Lectures (e-Resources):

- <https://nptel.ac.in/courses/112104172> • <https://nptel.ac.in/courses/112102304>
- <https://nptel.ac.in/courses/112105294>
- <https://www.coursera.org/courses?query=3d%20modeling&utm>
- <https://www.g sourcedata.com/a-guide-to-the-world-of-civil-engineering-drawings-the-architectural-atlas/>

1BCEDEC103/203 (ECE STREAM)

Electronic Components Visualisation (For CIE Only):

3D Modelling: Optical fibre cable with core and cladding, photonic crystal fibers, Antenna: Single element patch antenna, antenna array.

Sheet Metal & Surface Design: PCB Enclosures: Creation of different geometry with slots as per Standards: NMEA-0183, applying material properties for heat sink and water/dust proofing and rendering for realistic visualization.

Concept of Industrial drawing

Web links and Video Lectures (e-Resources):

- <https://nptel.ac.in/courses/112104172> • <https://nptel.ac.in/courses/112102304>
- <https://nptel.ac.in/courses/112105294>
- <https://www.coursera.org/courses?query=3d%20modeling&utm>
- <https://fiberoptics.com/optical-fiber-cable-structure/>
- <https://www.newport.com.cn/t/photonic-crystal-fibers>

1BCEDE103/203 (EE STREAM)**Electrical Drawing (For CIE Only):**

2D drawing of switches, sockets, panels, junction boxes, antenna, electric circuits.

Schematic diagrams of Automatic fire alarm, Call bell system, UPS system, Basic power system diagram.

Concept of Industrial drawing

Web links and Video Lectures (e-Resources):

- <https://nptel.ac.in/courses/112104172> • <https://nptel.ac.in/courses/112102304>
- <https://nptel.ac.in/courses/112105294>
- <https://www.coursera.org/courses?query=3d%20modeling&utm>
- <https://elion.co.in/understanding-electrical-drawings-a-beginners-guide/>

1BCEDM103/203 (ME STREAM)**Concept of Part Design (For CIE Only):**

3D Modeling: Simple machine parts / engineering components. (Applying material properties and rendering for realistic visualization)

Sheet Metal & Surface Design: Automotive panels, HVAC ducting concept of Industrial drawing

Web links and Video Lectures (e-Resources):

- <https://nptel.ac.in/courses/112104172> • <https://nptel.ac.in/courses/112102304>
- <https://nptel.ac.in/courses/112105294>
- <https://www.coursera.org/courses?query=3d%20modeling&utm>
- <https://www.classcentral.com/subject/sheet-metal-design?utm>