

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY
Department of Mechanical Engineering

ME-119 Engineering Drawing & Graphics

2014-15 Semester I

Sheet11: 3D Fabrication from Flat Patterns

Instructions:

- You will work in your respective groups. No change of partners is allowed. Each group will submit a common assignment. The roll numbers of both the members shall be written on the 3D model at the time of submission using a marker pen available with the TAs/RAs.
- Each group will work on one problem only. The problem assigned to your group will be displayed on the screen.
- You will be given only one thick sheet for this exercise. Identify a suitable scale accordingly.
- Draw the flat patterns using AutoCAD. No need to draw borders and name plates. You shall nicely layout the FPs in the A3 sheet so as to minimize wastage. Modify the FPs by adding additional strips/tabs that facilitate proper joining.
- When you complete drawing your FPs using AutoCAD, request the TA to verify your printable pdf files of the flat patterns. If they are correct, he will copy them into a pen drive. Go with him to the printer room, get it printed and collect the print outs from him.
- Go to an empty drawing table along with the card board and A3 printouts of the FPs. Cut the FPs from the printouts and paste them suitably on the card board sheet. Obtain the final thick flat patterns by cutting them from the card board.
- Use only the scissors for cutting. No paper cutter shall be used as you may injure yourselves; Furthermore, they leave cut marks on the drawing board. Each group must bring their own scissors, adhesive tape, fevicol glue tube and stapler.
- Fold the individual FPs into the respective constituent 3D shapes and join them using adhesive tape.
- Joint the constituent 3D shapes to obtain the desired object using adhesive tape.
- Write your roll numbers and submit.

Problem 1:

A square prism of 50 mm side and 200 mm length, intersects a cone with 180 mm base diameter and 180 mm slant length. Cone lies in HP and axis of prism intersects the axis of cone at 65 mm from its base. Prism has its lateral sides at 45° to HP. Develop the surface and produce 3D model.

Problem 2:

A square prism of 50 mm side and 200 mm length, intersects a cone with 180 mm base diameter and 180 mm slant length. Cone lies in HP and axis of prism intersects the axis of cone at 50 mm from its base. Prism has two of its lateral sides parallel to HP. Develop the surface and produce 3D model.

Problem 3:

A triangular prism of 60 mm side and 200 mm length, intersects a cone with 180 mm base diameter and 180 mm slant length. Cone lies in HP and axis of prism and cone bisect each other. Prism is oriented in such a way that it has one of its lateral surfaces parallel to HP and the opposite edge is towards the apex of cone. Develop the surface and produce 3D model.

Problem 4:

A triangular prism of 60 mm side and 200 mm length, intersects a cone with 180 mm base diameter and 180 mm slant length. Cone lies in HP and axis of prism intersects the axis of cone at 50 mm from its base. Prism is oriented in such a way that it has one of its lateral surfaces parallel to HP and the opposite edge is towards the base of cone. Develop the surface and produce 3D model.