Engineering Graphics and Design
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Week 7
Examples: Section Views of Assembly

Welcome to week 7. Today we are doing week 7 practical. In our week 7 practical, we will be doing Section View of Assembly. Separately, we did the section view in week 5. But in this lab, particularly, we will be focusing on working drawing. And working drawing means we will be here doing the assembly drawing and assembly of a system.

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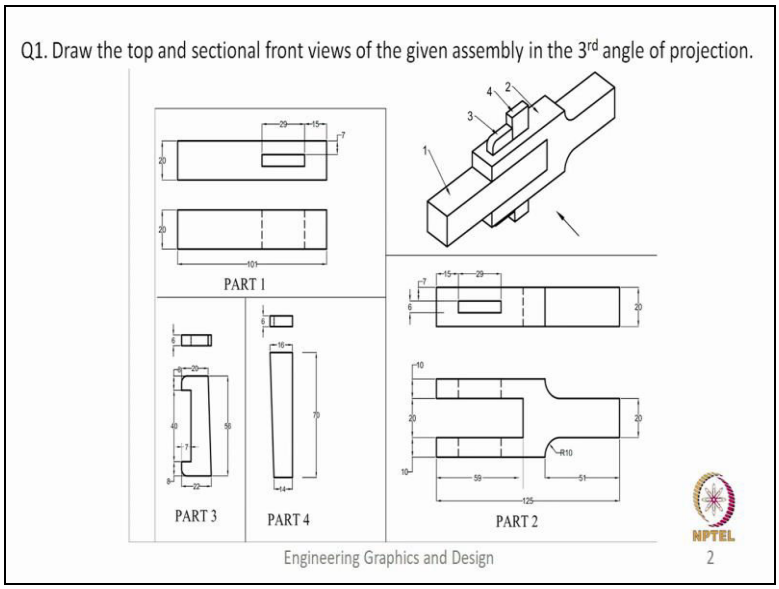

So, let us come to the question. The question is a draw the top and sectional front view of given assembly in the third angle of projection. A particular assembly is given here. This is the assembly. The name of this assembly is Gib and Cotter Joint. This is a joint. So, what is this gib and cotter joint?

The gib and cotter joint is usually used to joint two coaxial rods or bars together, together by the means of gib and cotter. If we come here, here we can see two parts. This part is called cotter and this part is called gib and these are the, this is the bar and this is the fork. These are the four basic parts of a gib and cotter joint.

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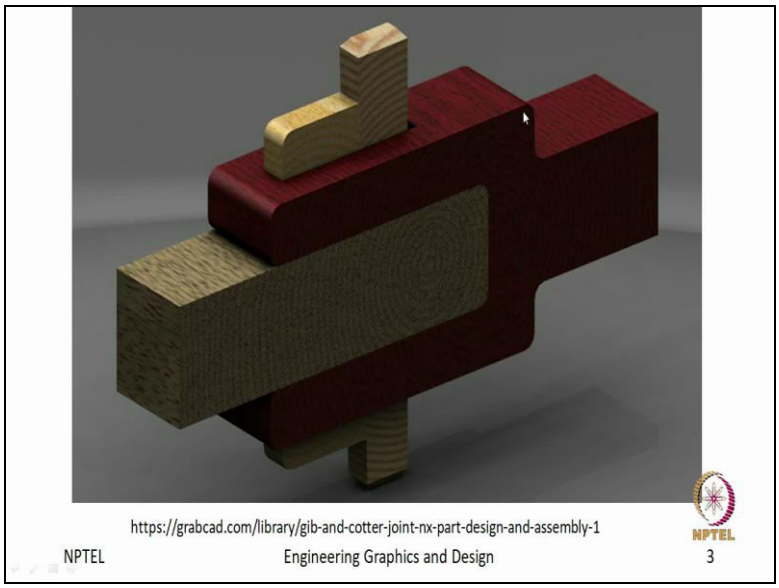

If we will see a photograph, may be it might be a bit clearer to us. This part is fork. This part is bar and these two parts is: this is cotter and this is gib. Cotter is a like wedge or flat shaped rectangular bar and one side of the cotter is always kept as a bit tapered. So that it will be easier for us to join the two systems. So, I will show a video for your convenience, so that you can understand how this assembly actually happens.

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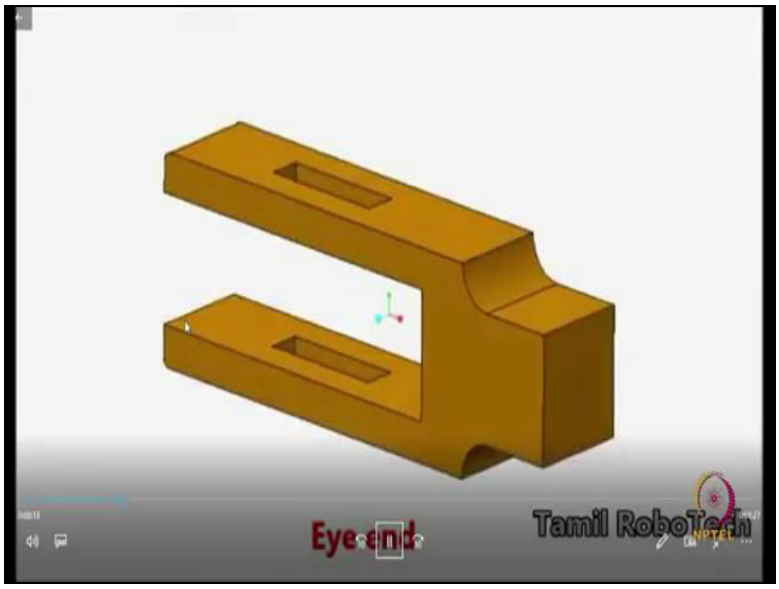

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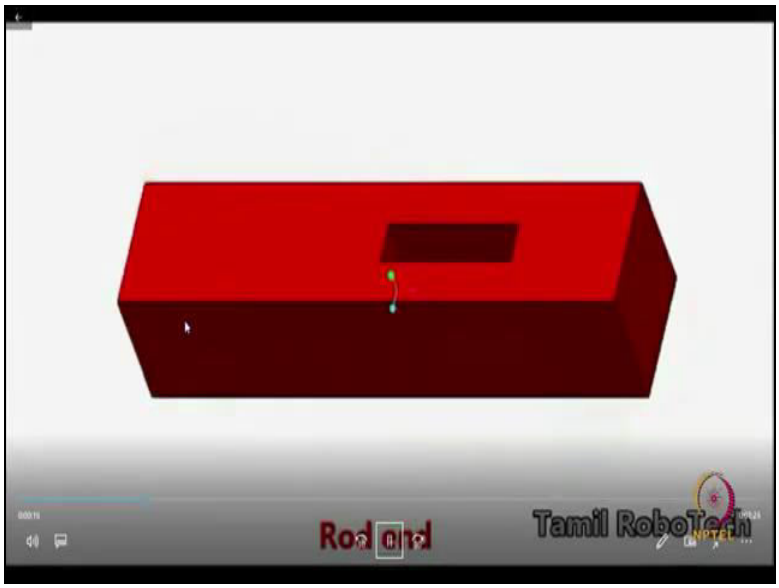

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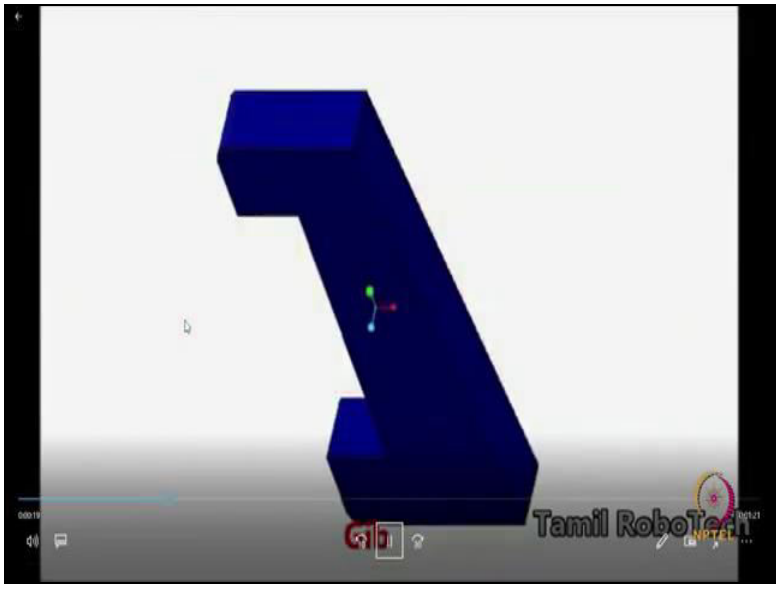

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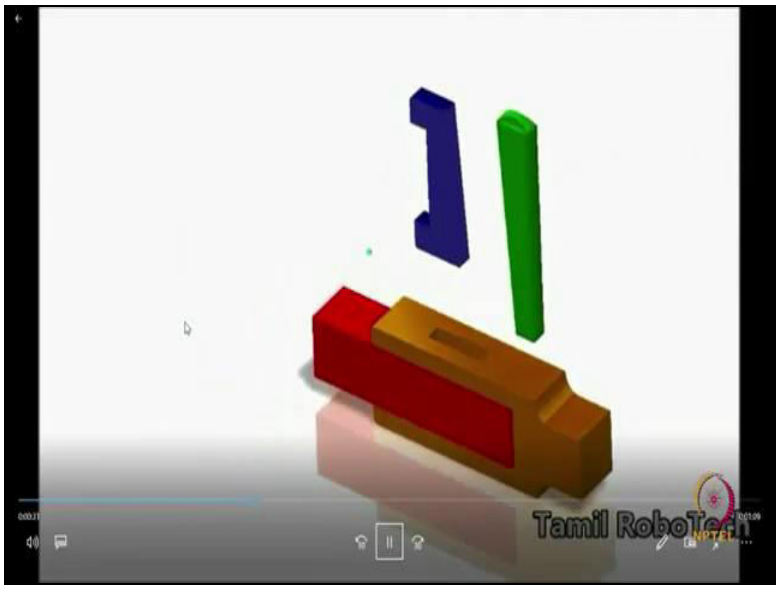

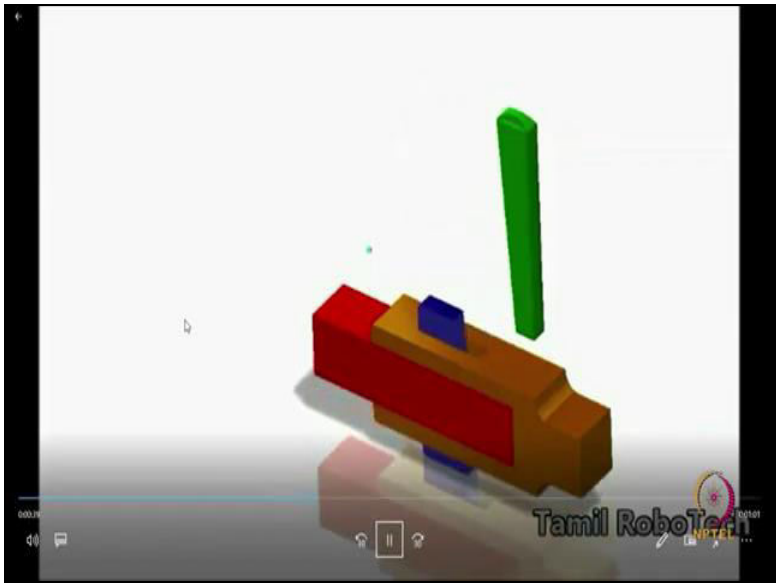

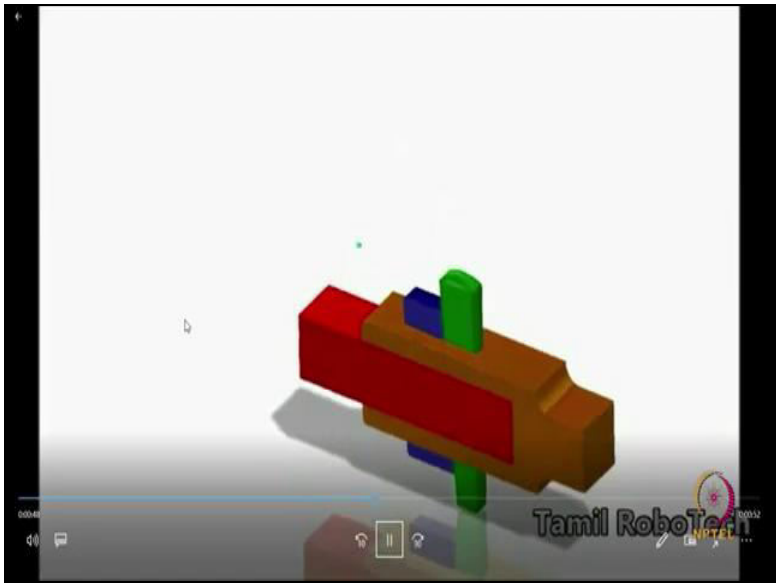

Look at this video. Say this is the fork. This is the bar or rod. This is the gib. And this is the cotter. Now see, how the assembly happens. We are joining the bar and the fork with the help of the gib. And finally, the cotter goes into this. And our assembly is done. This is the assembly of gib and cotter. Now you have a clear idea of how this gib and cotter joint works. Now we should come to the drawing.

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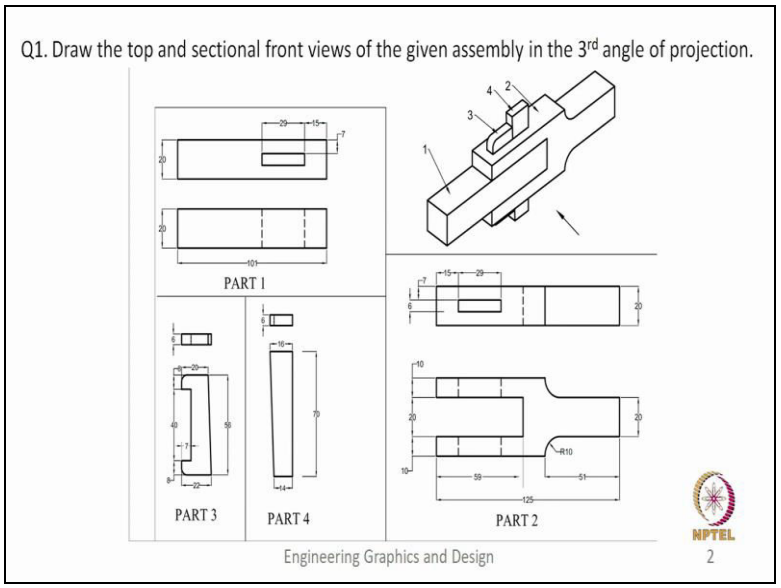

This is our question paper. And as I said this is the fork, this is the rod. This is the cotter and this is the gib. These are the four parts. The first drawing is sectional front view. We will start with the sectional front view. As it is a third angle projection, we will start the sectional front view from here. I have already drawn the reference line as well as I have already found a place where I will make the drawing. So let us start the drawing.

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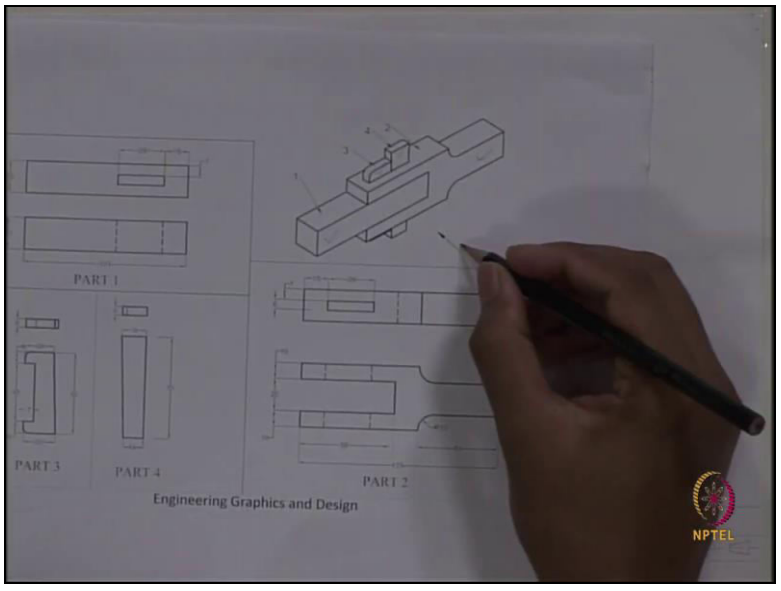

The first part what I will be drawing, if you see this is the front viewing direction, from the front, if you look at it, the outline of this we will be looking at. I think it should be very clear to if you look from this side, you will be looking at this face, this face. So without wasting

time, first we should be drawing these two parts. Later we will see like after sectioning what will be retained or what will be not. First, let us draw these two parts.

From here we will start. The first side has a length of 20. Then this side has a length of 20, then it has a length of 51, which includes an arc of 10. So, we will draw a length of 41 each. The same thing we will draw here also. The next part is this and this. If we see, the whole length of the part is 125 and this is 51. So, the rest of the part will be, from here to here will be 74. The whole length is 125. So, it should be start from here, from here to 74 this side.

If we look at here, here is an arc of radius 10. So, we have to draw that also on the both side. An arc of radius 10. First we have to find the center, from here at a distance of 10. This side also from here at a distance of 10. 10 this side, similarly, 10 this side. Now, the next part is, we have drawn this, we have drawn this, these two arcs and these lengths, the whole length.

Now, the internal part we have to draw. This bar is inside the fork. So, the dimension of the bar is already given here. Some part is inside the fork and some part is outside. The whole length is 101 and here this length is 59. So, a length of 42 will be outside the fork. This is a length of 10. This also has a length of 10. This has the length of 59. Similarly, this has a length of 59 also. And we have to join this. This part we have drawn.

Now, this part. This part has a length of 101 and width of 20, 101. The two important part we have already drawn. One is the fork and other is the bar. But here the catch is there. We have been asked to draw the sectional front view. If this is the front view and if there is a section, section goes through this, section goes through this, this, this and this.

Then we have to draw the view of the internal part also. We will be able to see the gib and cotter also while doing section. So, we should draw that also, not only the outer parts. So let us come to that. So actually whatever we have drawn that is after the cutting. After cutting also we will be seeing this kind of cross section. So, that we have drawn. Now, another two part is left, that is the gib and cotter. Those two are left. That we have to draw, because we are doing the sectioning we will be able to see these two parts also.

If we look properly that there is a kind of key, from where we are inserting those two things. That has a size of 29, and what is the distance? It has a distance from this left side it has a distance of 15. So, that we have to draw. 15 from this side, then a length of 29, till this point. Here also it is same. 15 from this side then a length of 29. Here, our cotter will be there.

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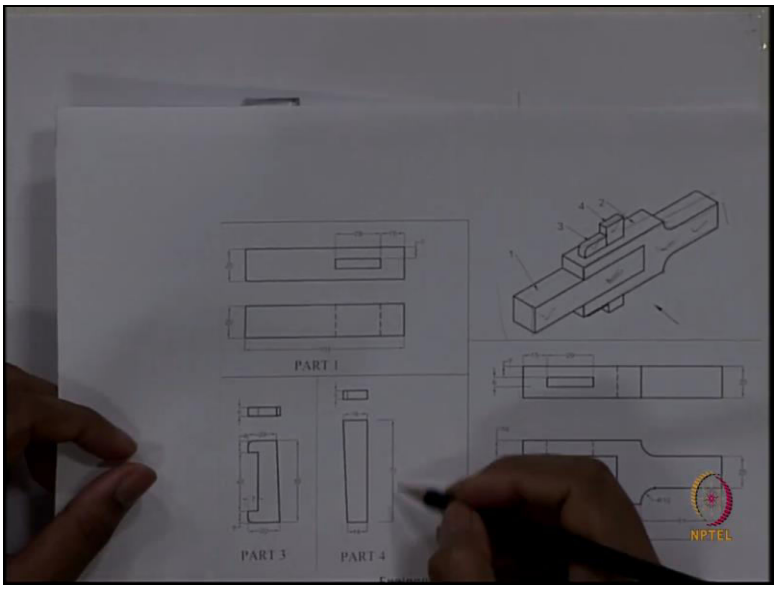

The length of the cotter is 70. And if we look at here, some part will be outside, some part will be outside, what is the whole length, we have to draw. So, some part, the top part, it has a width of 16. It as I said already like it is a taper part and the lower part has a width of 14. That we will draw. This is 14. And this is 16. And we have to join this to get the cotter.

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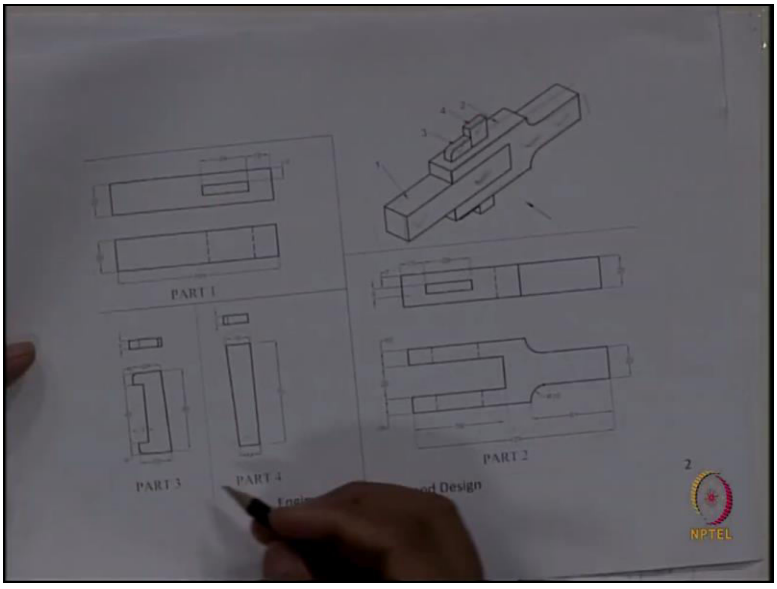

The next part is the gib. This side is already there. Like this has a length of 56 and this is a 40. The 40 is automatically will be matched with this part. These from these to this is already 40. And on top of this it will have a length of 8. And this length is 7. And this whole length is here 22. Here 20. So, first we will draw this, 8, at a distance of 7 from this side.

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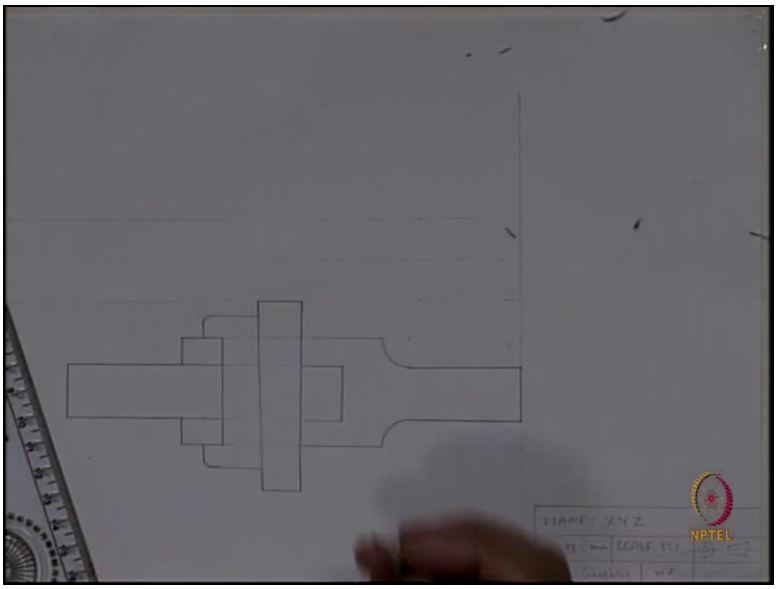

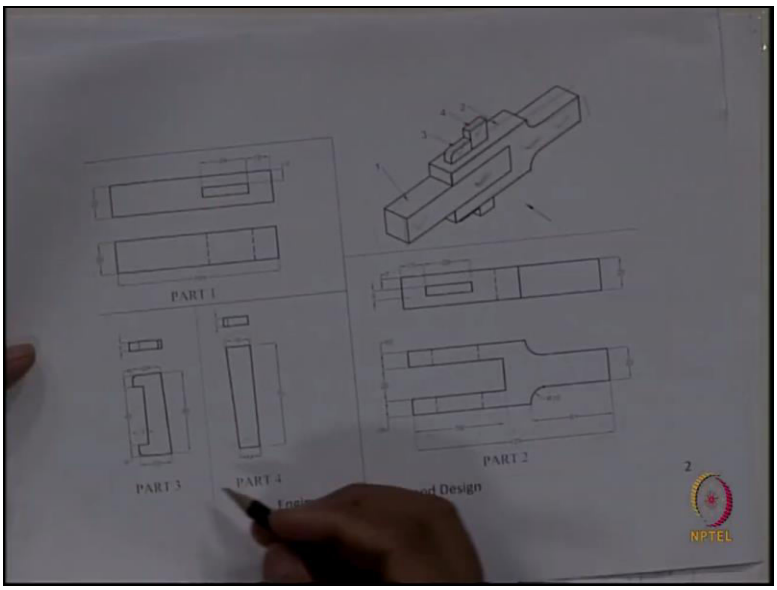

This has a length of 7, from here the length of 8. And if you see this distance; is automatically, by default, it is 22. You do not need to measure again. Here also it is the same. 7 from this side, now a distance of 8. See, now the interesting part is coming.

We will be able to see the gib and cotter, while looking at the section view. So, these internal lines we have to remove. So, we will be removing those lines, so that we can clearly see the gib and cotter, because it is a sectional view. So, this side of the gib is that is actually there is a fillet. So, this much small fillet you can even do it by your hand.

And it should be clear to you that these lines I have removed. There should not be any line because it is the section view. And in that section view what we should see? We should have

section we should sectioned this and this part. So this whole part we will be able to see this kind of section, even for these also we will be able to see section.

But these are two different parts, as it has been covered in the lecture that if there are two different parts, we should do the sectioning line in such a way that there is a clear distinction between these two lines. Is it clear? So if we do the sectioning, here, like this, so this part should have a sectioning like this, opposite, so that we can distinguish. So, we have to do the sectioning.

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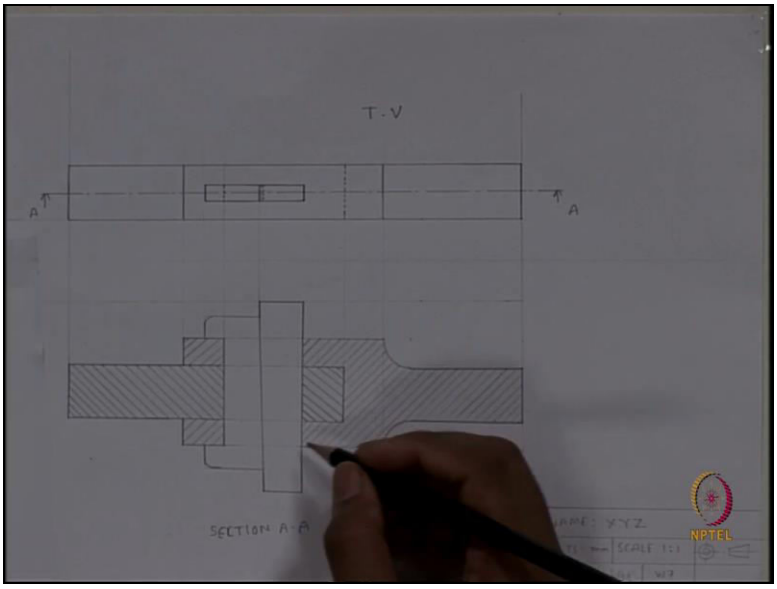

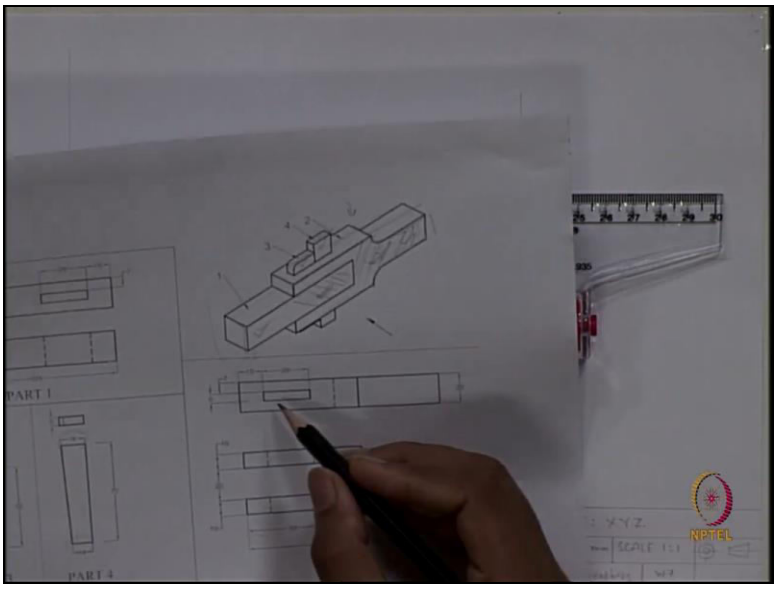

Let us say for this part if we do the sectioning, like this, if we do it like this for this part, for this part we have to do it on the other way, like this. So, now we will be doing the sectioning.

We have finished drawing the sectioning lines for one part, but still we have to draw it for the other part. Our sectional front view is done, this part and this part.

This was sectioned directly and as we said previously also we would not do sectioning for those parts which are actually joining two different parts, like bolts, screws, in this case cotter and gib. We would not do sectioning for this part. So, these parts will be intact. The other two part the fork and bar was sectioned and we did show the sectioning line for these two parts.

And for showing sectioning parts in two different cases, we can use the different angle lines like here I have used +45° and -45° as well as you can use different spacing also that I have not used here, but in your case you can always use. So, sectional front view is done. Now we will be going for the top view, for the same.

For this assembly, if we look from the top, it is very clear like we will be able to see one rectangular outline, one whole rectangular outline. The left side will be starting from here and the right side will be starting from here. And the position of this outline we can easily get, if I draw a projector line from the front view. From the front view I have drawn to here one projector line, here one projector line.

So, definitely the whole rectangle will be within those two projector lines, and it has a width of 20. 20 this side and 20 this side. This will be the whole outline we will be looking from the top. Now let us come at this point. From here the arc has been started and if we look from the top, we will be able to see this line. This line is at a distance of 51 from the right side. We will be able to see that this line.

And from here also if we draw a projector line, directly we can get the position, like this or we can directly measure from here also, from this side. From both side we can measure. This side also if we look from the top there is a change of edge, from one edge to another edge. Here also we will be able to see one line and that line has a distance of 42 from the left. Either from this or directly from this projector line, we can draw this.

And in that top view what else we will be able to see? We will be able to see that top portion of the gib and the cotter. Top portion of the both. And what is the length, the total length of them? 20 is for gib and 16 is for cotter. First we have to define the center for this part. This is the cutting plane that I have right now drawn. First I have drawn the sectional front view actually, but I should have drawn it later after the top view.

First you should start, you can start, with the top view also. In that top view here is the cutting plane. Once you cut along this plane, you will be able to see this sectional front view. First I have drawn this so that you can understand the actual parts like the gib and cotter. That is why I have drawn this first, and now I am drawing this.

This key slot has a width of 6. This side 3, this side 3. And total distance of 36 I have to take, because I am looking at the top view, the whole 36 lengths I will be able to see. Which lengths I will be able to see? Till this part. From this part to this part I will be able to see. From here again 6.

This is the key slot as well as that top part of the gib and cotter what I will be seeing in the top view that I have drawn. Another important part is I will be able to see this part from the top. But inside the gib there is a cut. So that cut I have to represent and I have to represent that using a hidden line. And the hidden line will be positioned exactly above this line.

If I draw a projector line; on top of the projector line, here the hidden line will be there. This hidden line is for this cut of the gib. And corresponding to this corner line, I will be able to see another line here. That also I will draw. And corresponding to this line already I have drawn this, but if you properly look at the cotter, it is actually inclined.

So corresponding to this corner I can see one line but this line will be at a distance from this line. Again this point will be at a distance from this corner. And the end point also will be at a distance from this corner. So, for all of these three points actually I should see three different hidden lines that also I have to draw here.

One hidden line and in between this and other two hidden lines, another and for this point. So, actually in this small area, there is one solid line and three hidden lines, one solid line for this corner and three hidden line for this point, this point and this point. These areas actually we have to do that.

I know that you are not able to look at this properly, but still you have to show this. Another point is when we are looking from the top, this part of the bar actually the bar is ended here the fork is started here. So, corresponding to this part also we will be able to see a hidden line that also you have to show. This will be corresponding to this line. Here we have to show another hidden line.

So, now, I think we are almost done. This is the top view. And this is the sectional front view for a gib cotter assembly. This will be our viewing direction. And this is the cutting plane and after cutting, this is the view of Section A-A. Again I am repeating you, repeating for you that this is our top view. So, if we look from the top, what we will be see?

We will be see this part is this, this part along with a hidden line of for this, is this and this. We will be able to look at this cotter and the gib from the top and the cotter has some inclined part that is why we put the hidden lines over there. The gib has a hidden part. So we have put hidden lines here. Corresponding to this again another solid line and corresponding to this another solid line. So our top view is done.

And in top view, we have the sectioned it like this, like this we have sectioned. And the sectional front view we have drawn here. In the sectional front view, we did not section the gib and cotter because already we have said you previously like we do not do sectioning for bolt, nut, screw, cotter those parts. Cotter is used for joining.

This is a fastener. We do not do sectioning for this. But for the fork and the bar we will do sectioning and those are two different parts. So we did the sectioning with two different angles. So with this actually I think we should be able to finish this. So thank you all. We will again meet in next week lab.