

# GEOMETRICAL AND MECHANICAL DRAWING (869)

**This subject may not be taken with Geometrical and Building Drawing.**

Candidates will be required to reach a minimum standard in the subject as a whole. The use of drawing board, tee-square and set-square will be required. (Candidates may, if they wish, use a

drawing board fitted with a parallel motion straight edge. The use of drafting machines will be permitted). A2 size paper will be used. The recommendation of IS:696-1972 Indian Standard, Code of Practice for General Engineering Drawing should be followed.

## CLASS XII

*There will be two papers in the subject:*

**Paper I - Theory: 3 hours..... 80 Marks**

**Paper II - Project Work ..... 20 Marks**

### PAPER I (THEORY): 80 MARKS

#### Drawing (Engineering)

Candidates will be required to answer **all** questions.

The preparation of working drawings and assemblies from dimensioned sketches based on the following:

- fastening (nuts, bolts, studs, keys, cotters, pins, locking devices);
- rigid and flexible joints;
- screw threads; their projection and the proportions of standard types;
- transmission of motion and power, bearings, supports, shafts and coupling ;
- pressure transmission in pipes using water, oil, steam and gas;
- constructional details of prime moves and simple machine tools;
- the use of reference points and planes in dimensioning, machining and surface texture symbols;
- toleranced dimensions involving the use of IS:919 or B.S. 4500 Limits and Fits for Engineering.

Candidates will be expected to follow the recommendations given in IS:696 - 1972 Indian Standard, Code of Practice for General Engineering

Drawing. They should be familiar with both First and Third Angle projections.

### PAPER II (PROJECT WORK): 20 Marks

All candidates will be required to have completed **three** project sheets, selecting at least **one** from Section A (Orthographic Projections) and **one** from Section B (Assembly Drawings). **Each** Project sheet will carry **5 Marks**.

The Project work will be assessed by the subject teacher and the Visiting Examiner appointed locally and approved by the Council.

**Mark allocation for each Project sheet (5 marks)\*:**

Criteria		Marks
1.	Project size / completeness	1
2.	Line Quality	1
3.	Neatness	1
4.	Accuracy	1
5.	Title Block	1
<b>TOTAL</b>		<b>5</b>

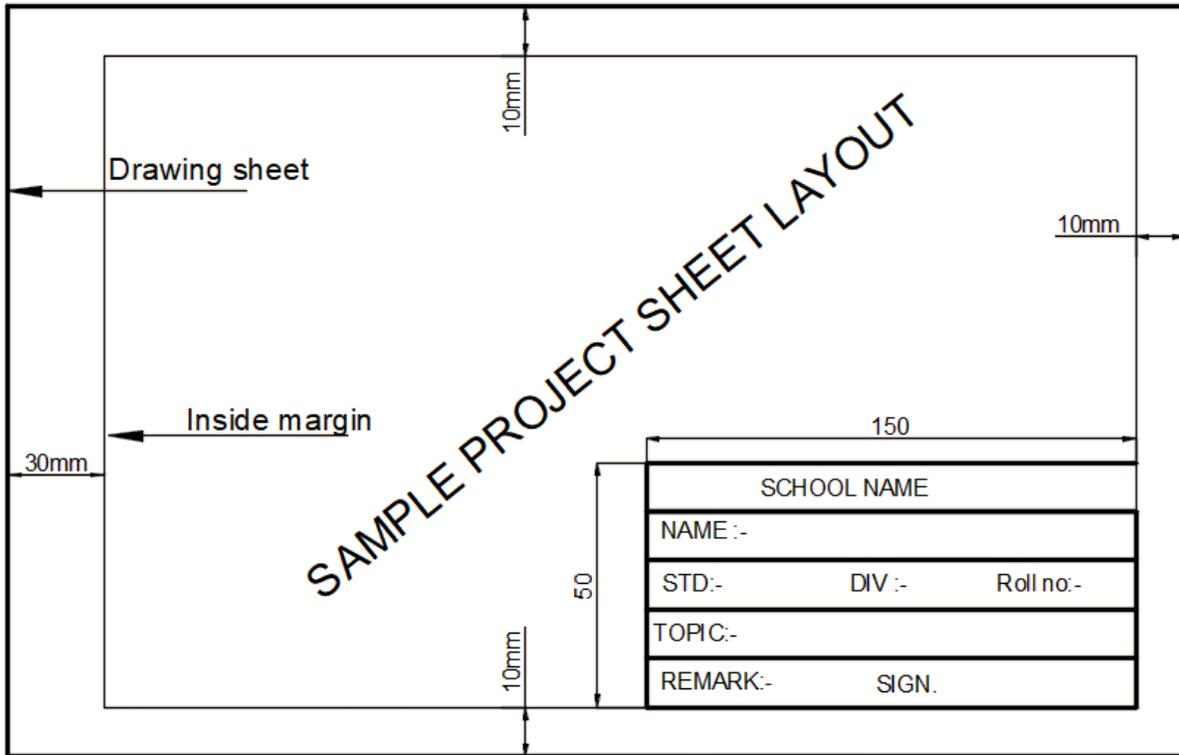
**Marks out of 20 will be distributed as given below:**

1.	3 Project sheets × 5 Marks	15 Marks
2.	Viva-Voce (Visiting Examiner)	5 Marks
<b>TOTAL</b>		<b>20 Marks</b>

**NOTE: No question paper for Project work will be set by the Council.**

## Instructions for Project Work:

- Candidates must use A2 size (**Half Imperial**) drawing sheets to complete all projects. A sample project sheet layout with specifications, is given below:



- Candidates must use the given layout and specifications to complete each project sheet.
- Accuracy, neat and clean work is expected from candidates while completing the project sheets.
- Candidates need **not** draw / paste the questions.
- For assembly drawing, candidates need to draw:
  - (i) Full sectional F.V.
  - (ii) T.V. by using 1<sup>st</sup> **OR** 3<sup>rd</sup> angle method of projection (omitting all the hidden lines)

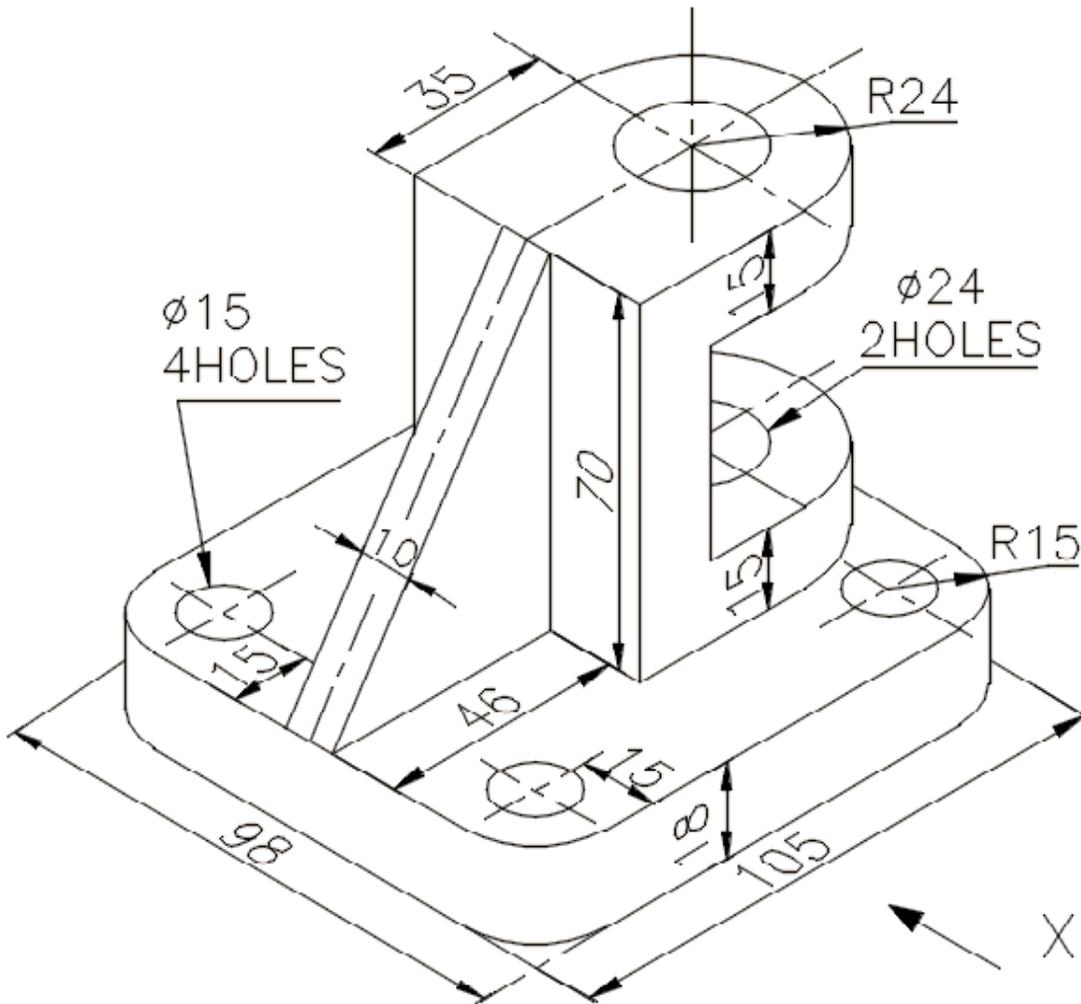
## PROJECT SHEETS:

Candidates are required to have completed **three** project sheets, selecting at least **one** from **Section A** (Orthographic Projections) and **one** from **Section B** (Assembly Drawings).

### SECTION A - ORTHOGRAPHIC PROJECTIONS

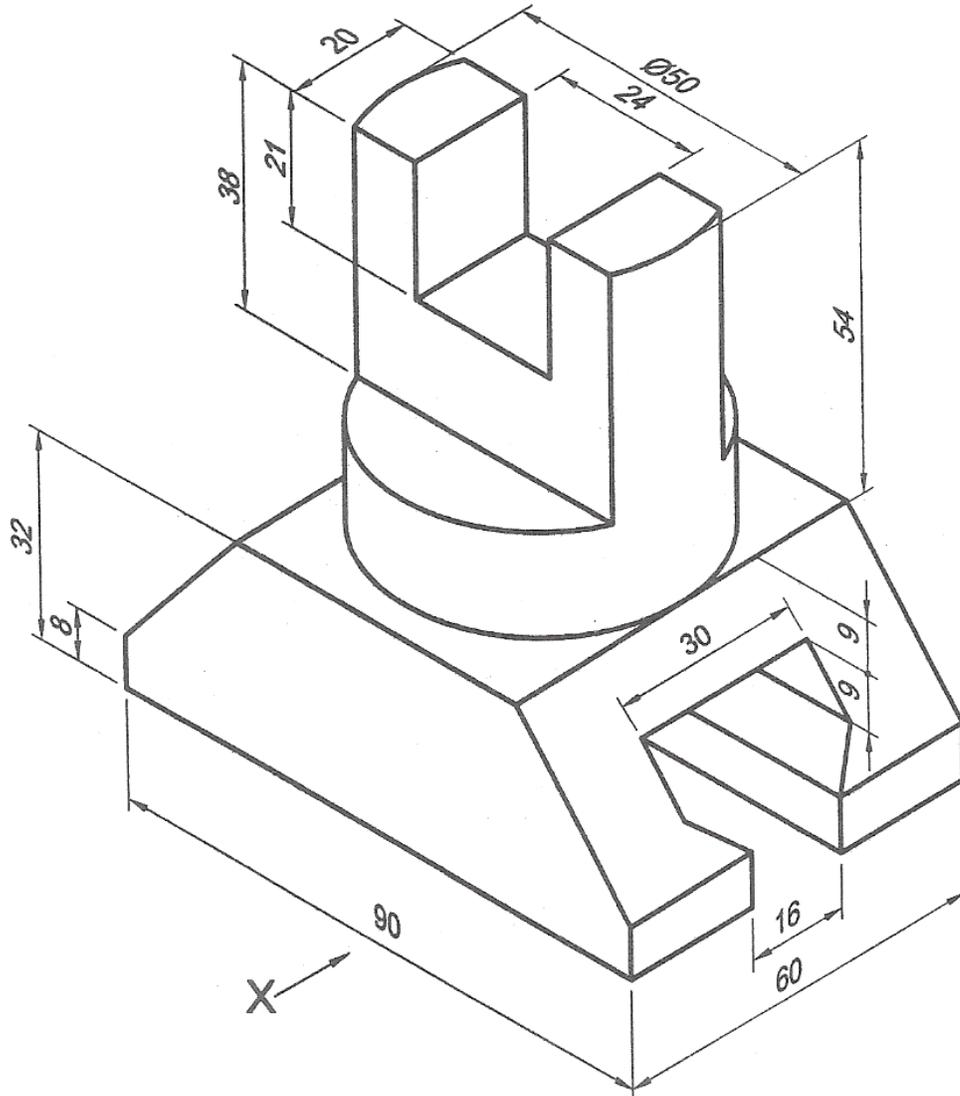
#### Project Sheet 1

Draw by using 1<sup>st</sup> OR 3<sup>rd</sup> angle method of projection i) F.V, ii) T.V. & iii) L.H.S.V



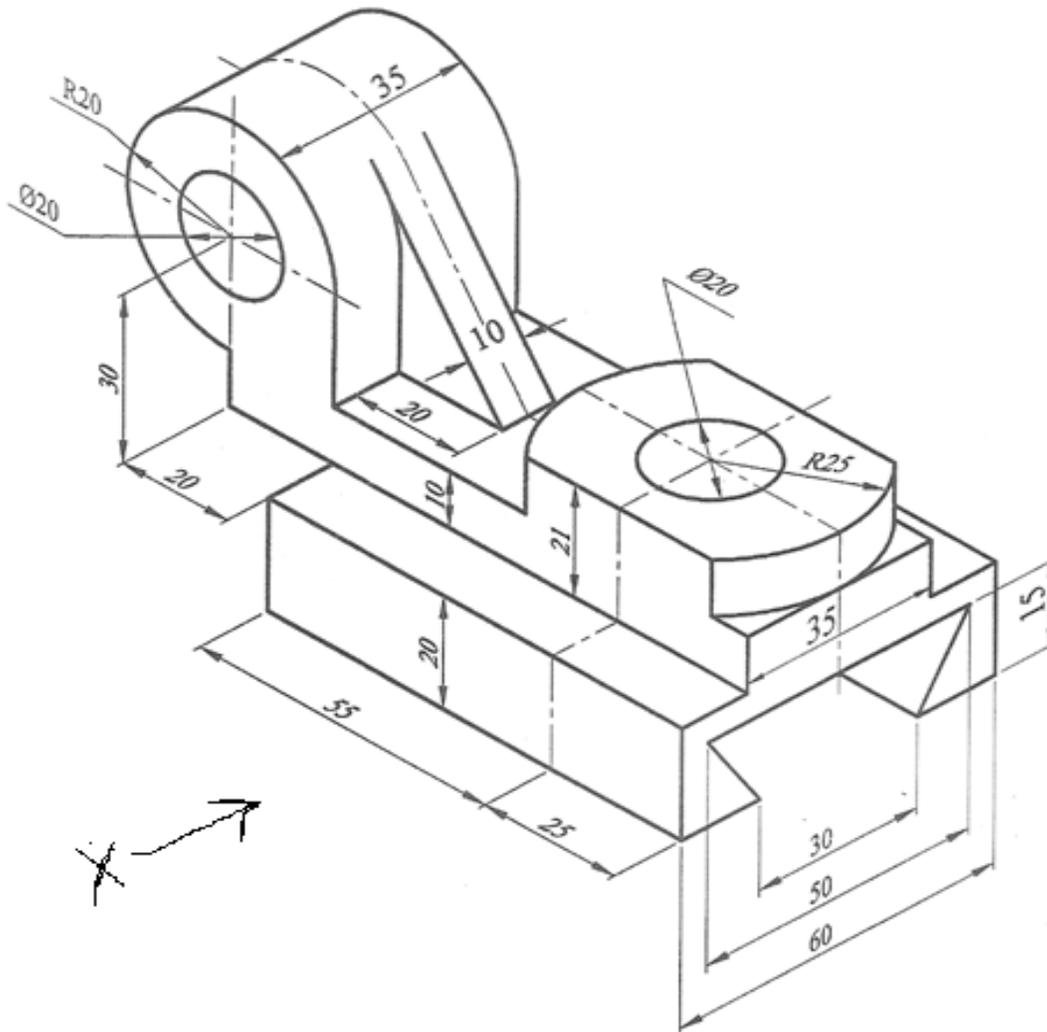
**Project Sheet 2**

Draw by using 1<sup>st</sup> OR 3<sup>rd</sup> angle method of projection i) F.V, ii) T.V. & iii) R.H.S.V



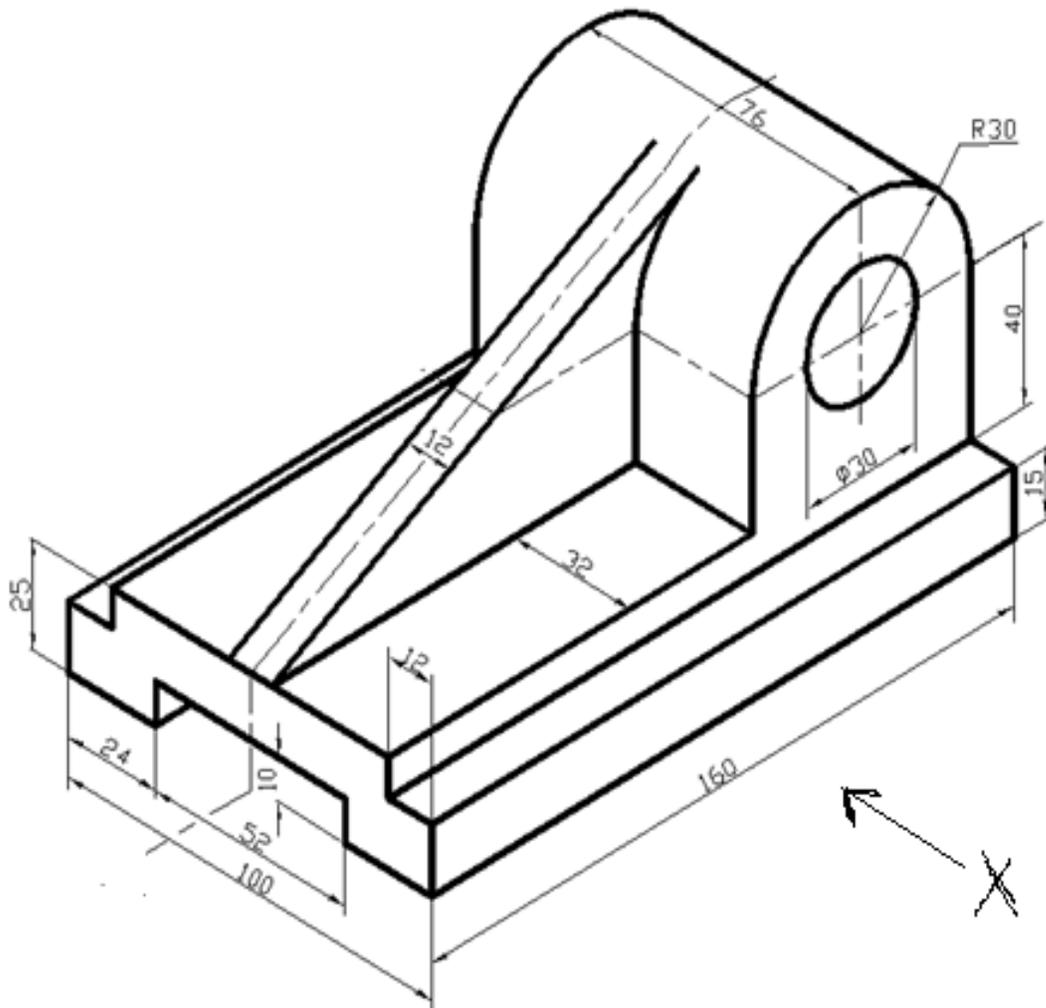
**Project Sheet 3**

Draw by using 1<sup>st</sup> OR 3<sup>rd</sup> angle method of projection i) F.V, ii) T.V. & iii) L.H.S.V



**Project Sheet 4**

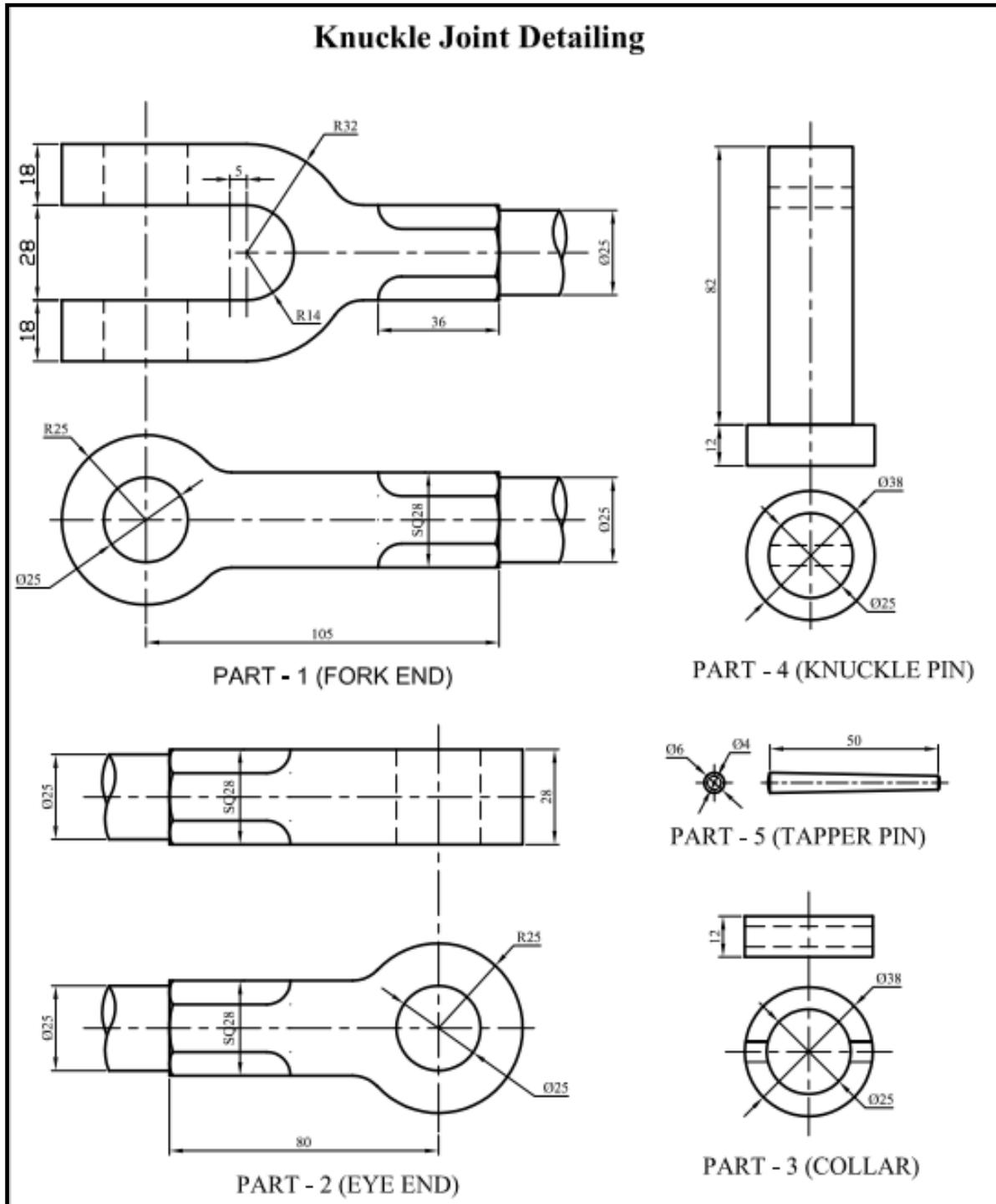
Draw by using 1<sup>st</sup> OR 3<sup>rd</sup> angle method of projection i) F.V, ii) T.V. & iii) L.H.S.V



# SECTION B - ASSEMBLY DRAWINGS

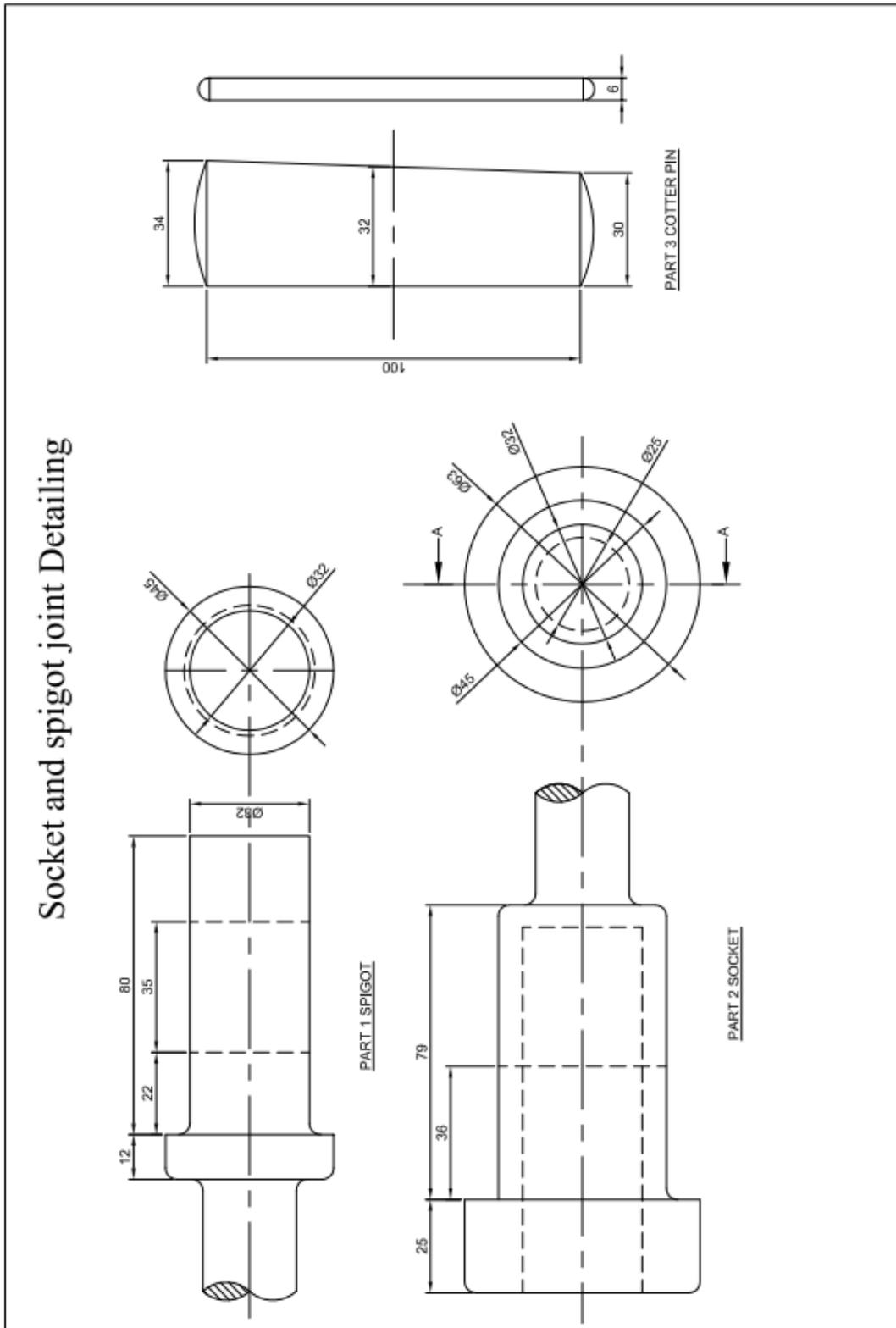
## Project Sheet 1

Draw full sectional F.V & T.V of the following details of machine Parts. (omitting all hidden details)



## Project Sheet 2

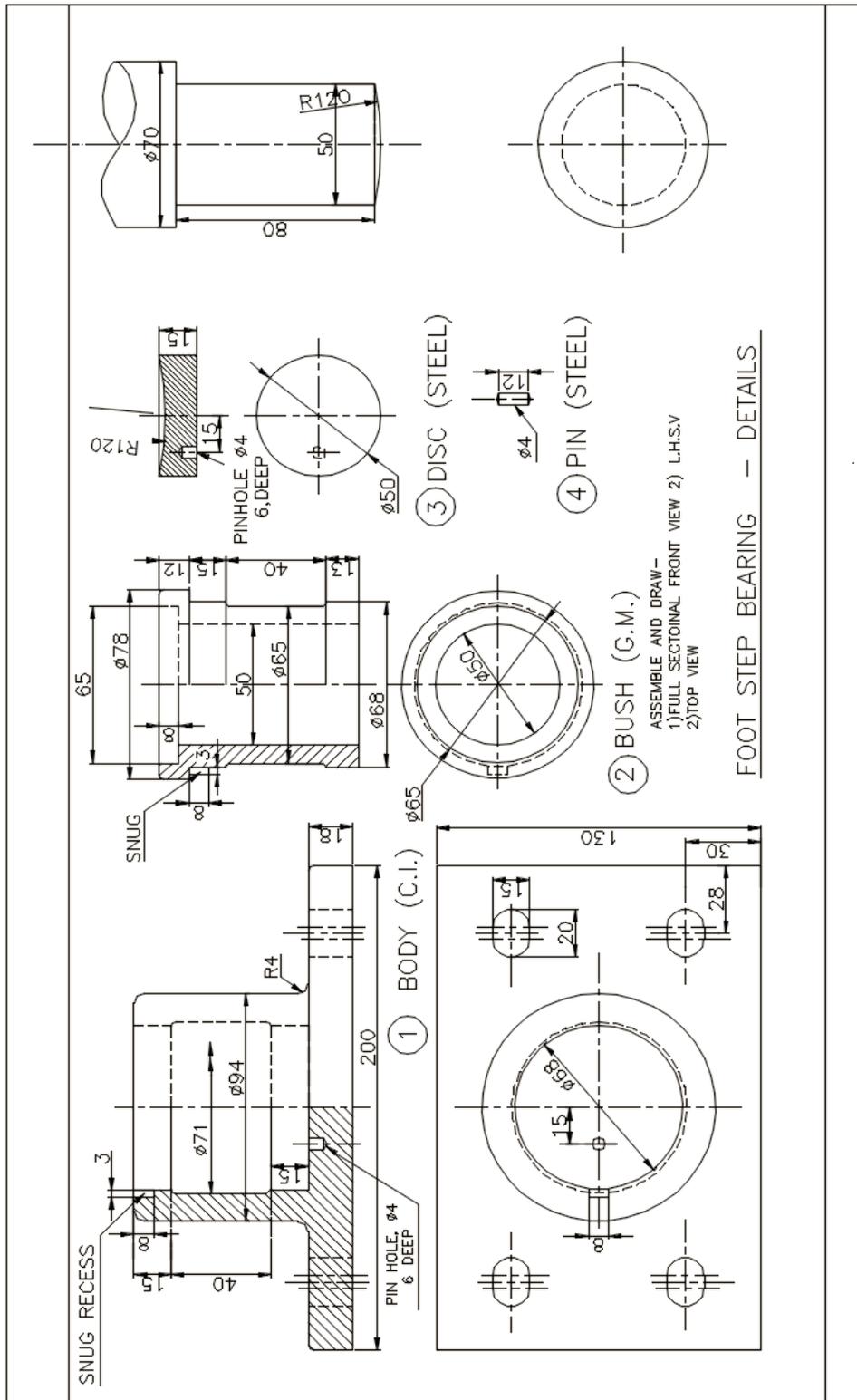
Draw full sectional F.V. & T.V. of the following details of machine Parts. (omitting all hidden details)





### Project Sheet 4

Draw full sectional F.V & T.V of the following details of machine Parts. (omitting all hidden details)



### SAMPLE TABLE FOR PROJECT WORK

S. No.	Unique Identification Number (Unique ID) of the candidate	<b>PROJECT SHEETS</b> (Total 3 sheets of 5 marks each)				TOTAL MARKS
		A	B	C	D	
		Teacher	Visiting Examiner	Average Marks (A + B ÷ 2)	Viva-Voce by Visiting Examiner on all three project sheets	
		15 Marks	15 Marks	15 Marks	5 Marks	20 Marks
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

\*For breakup of the 5 Marks (for each project sheet) to be awarded separately by the Teacher and the Visiting Examiner, please refer to the table giving the criteria for mark allocation for *each* project.

**NOTE: VIVA-VOCE of 5 Marks on the Project Sheets is to be conducted only by the Visiting Examiner and should be based on the Project Sheets only.**