

Fig. 21.108

Weld this side. When the symbol is below the reference line the weld is to be placed where the arrow indicates.

Weld the far side. When the symbol is above the reference line the weld is to be placed on the far side of the joint that the arrow indicates.

Weld all round, e.g. welding of cylinders, pipes etc.

Weld on site.

Spot weld.

Seam weld.

Supplementary symbols are used with the main welding symbol to give additional information.

Activities

OFFSET SECTIONS

Q1.

- Draw the given elevations of the machined block as shown in Fig. 21.109.
- Project an offset sectional plan A–A from the elevation.

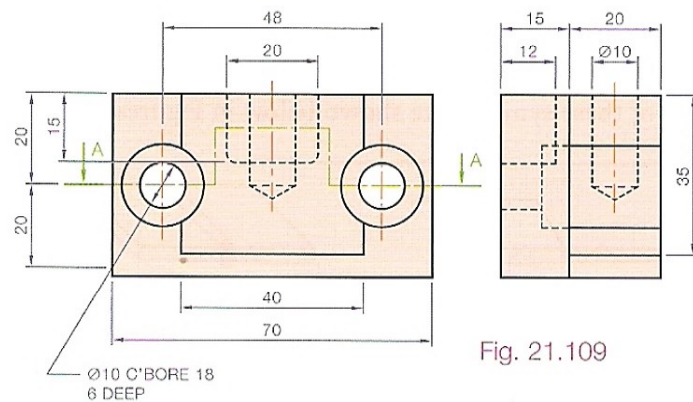


Fig. 21.109

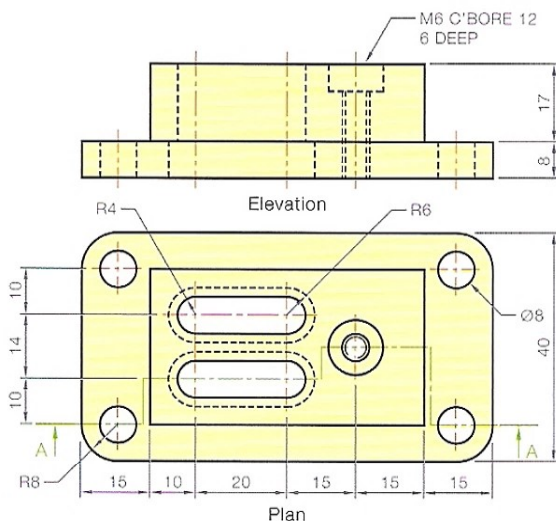


Fig. 21.110

Q2. Given the plan and elevation of a shaped block in Fig. 21.110.

- Draw the given plan.
- Project the offset section on section plane A–A.

ALIGNED SECTIONS

Q3. and Q4.

In Figures 21.111 and 21.112 you are given the plan and elevation of a shaped block.

- Draw the given views.
- Project an aligned end view on plane A-A.

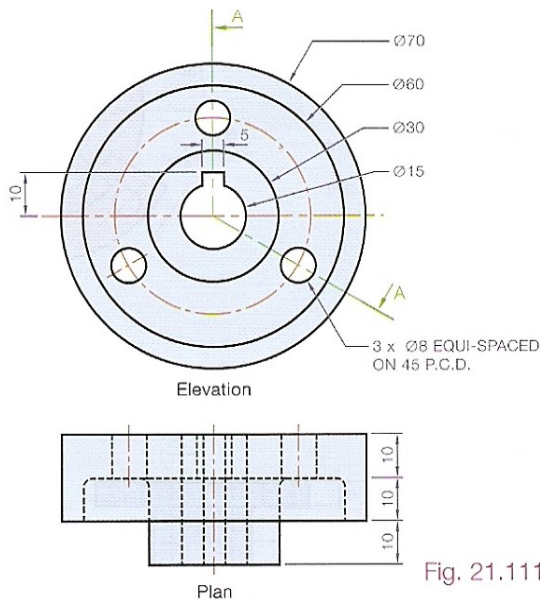


Fig. 21.111

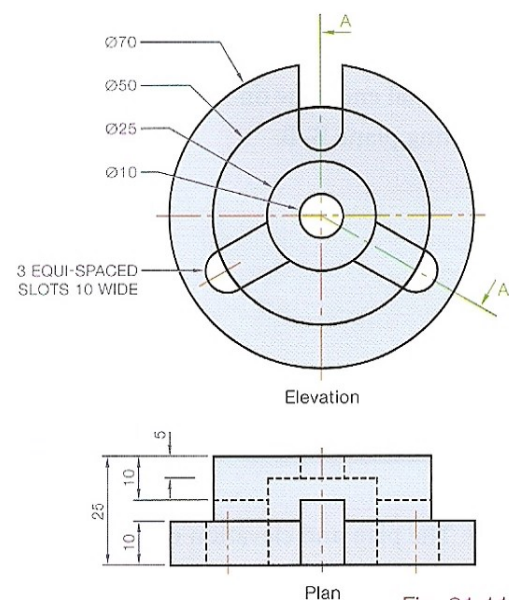


Fig. 21.112

Q5. and Q6.

In Figures 21.113 and 21.114 the plan and elevation of a shaped block are given in first-angle projection.

- Draw the given views in **third-angle** projection.
- Project an aligned end view on plane A-A.

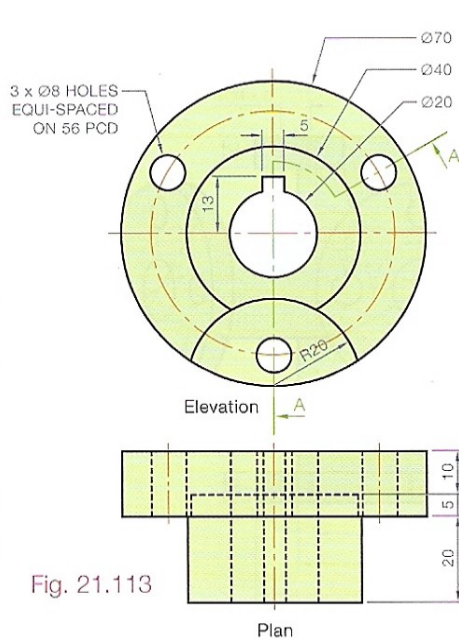


Fig. 21.113

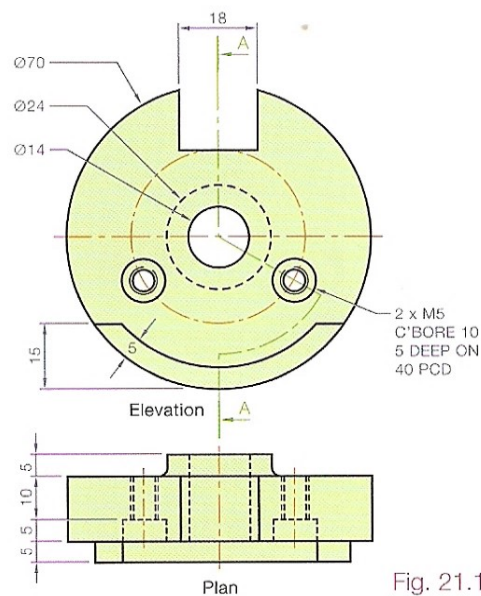


Fig. 21.114

HALF SECTIONS

Q7. and Q8.

In Figures 21.115 and 21.116 the plan and elevation of a shaped block are given.

- Draw the given views.
- Project a half-sectional end view on cutting plane B-B.

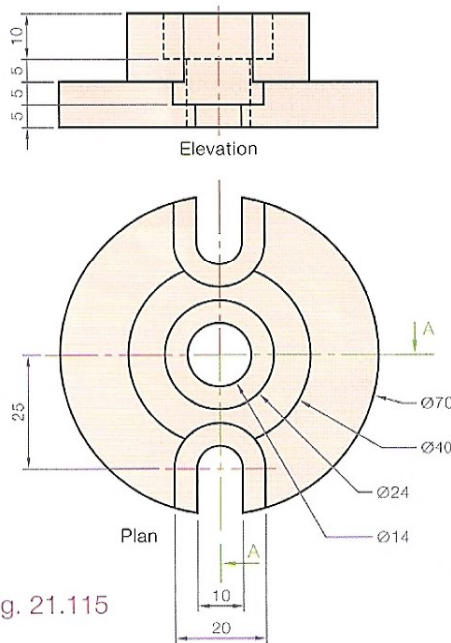


Fig. 21.115

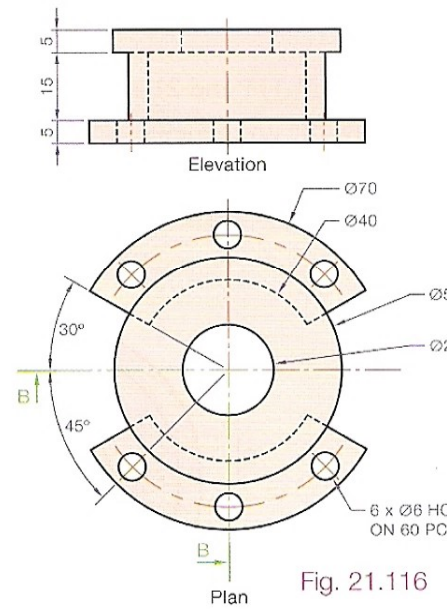


Fig. 21.116

SECTIONS

Q9. The plan and elevation of a valve casting are shown in Fig. 21.117.

- Draw the given elevation.
- Project a sectional end view on plane A-A.
- Insert:
 - ISO symbol,
 - six leading dimensions,
 - the title 'VALVE CASTING'.

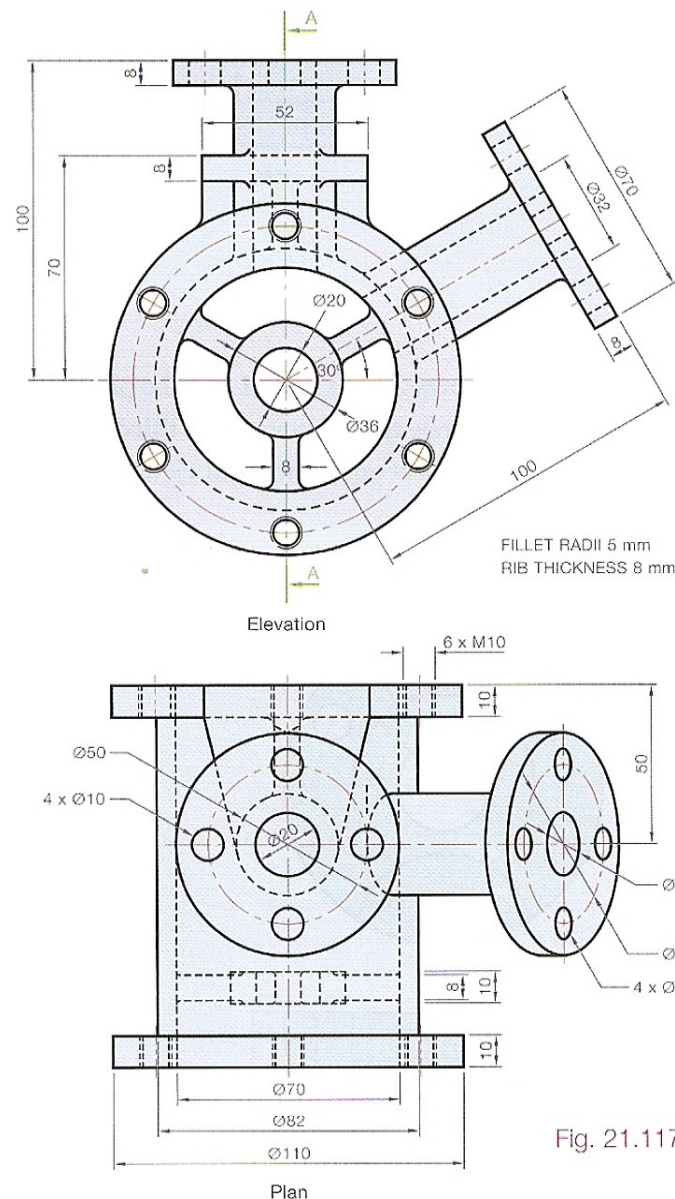


Fig. 21.117

Q10. The front elevation and side elevation of a Coupling Block are shown in Fig. 21.118.

(i) Draw a sectional elevation A–A of the block.

(ii) Draw a sectional elevation B–B of the block.

(iii) Insert the following on the drawing:

- Six leading dimensions.
- ISO projection symbol.
- Title 'COUPLING BLOCK'.
- Symbol to indicate that the top surface S must be machined on a milling machine to a surface texture N7.
- Symbol to indicate that the side surface T must be honed to a surface texture N4 with a multi-directional lay.

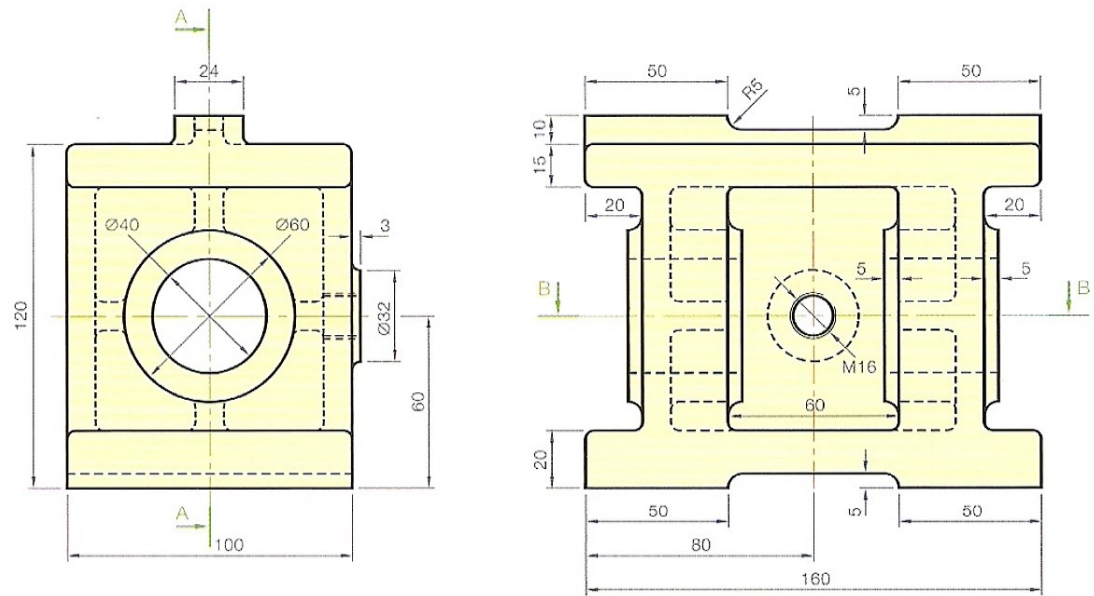
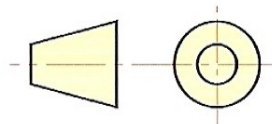


Fig. 21.118



UNDIMENSIONED WALL AND
WEB THICKNESS 10 mm
UNDIMENSIONED RADII 3 mm

SECTIONED VIEWS IN PICTORIAL

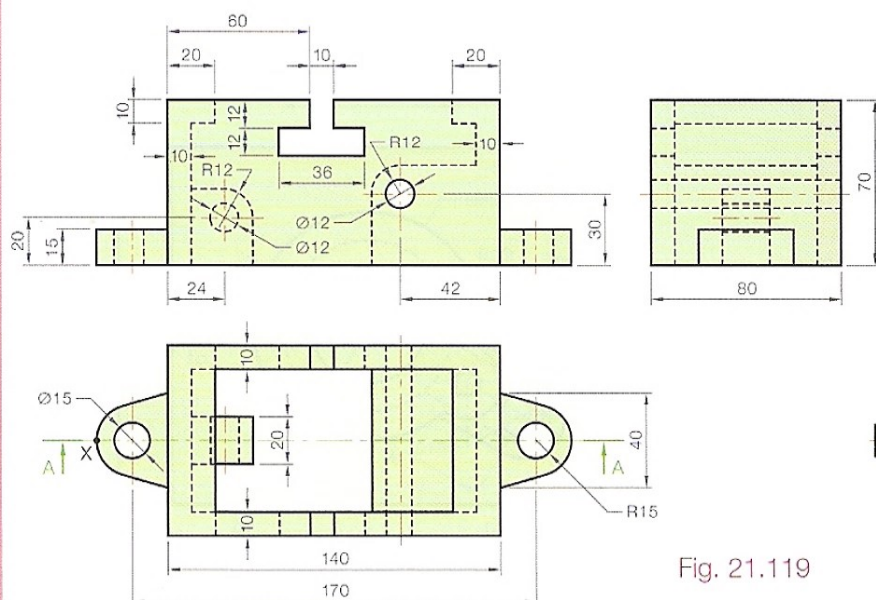


Fig. 21.119

Q11. Fig. 21.119 shows three views of an anchor block.

- Draw a sectional elevation on cutting plane A–A.
- Draw the full plan.
- Draw an isometric view of half the block on section plane A–A and having X as the lowest point on the drawing.

Q12. Given two elevations of a vehicle rear hub.

- Draw the given front elevation.
- Project a half section on cutting plane AAA.
- Draw an isometric view of the half section showing a good view of the cut-out section.

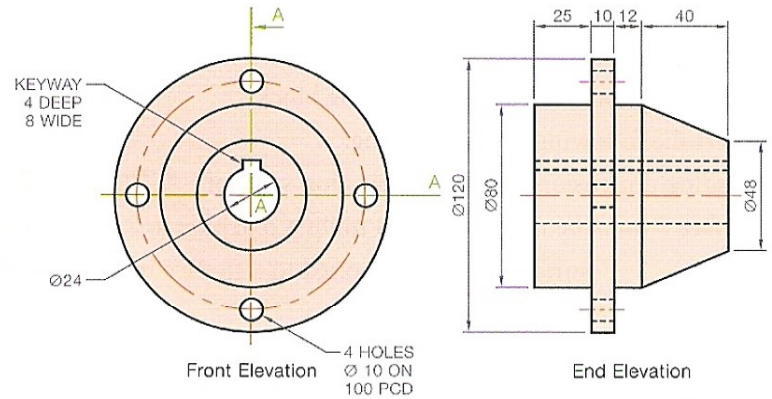


Fig. 21.120

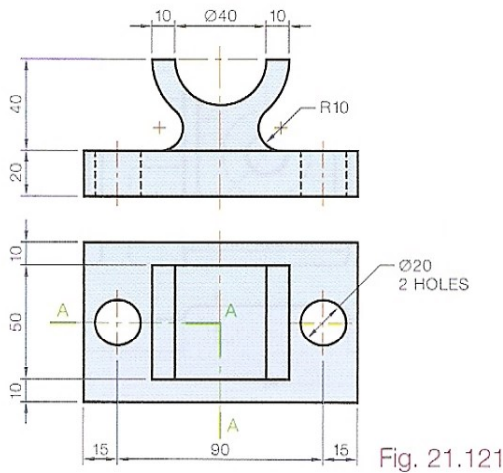


Fig. 21.121

Q13. Fig. 21.121 shows a guide shoe.

- Draw the given plan and project a half-sectional elevation on AAA.
- Draw an isometric view of the shoe with the quadrant removed showing a good view of the cut surfaces.

Q14. The plan and elevation of a machine casting are shown in Fig. 21.122.

- Draw the sectional elevation AB_1 of the casting. The inclined portion of the cutting plane may be revolved onto the plane of projection.
- Draw an isometric view of the half of the casting cut on the section plane BB_1 .

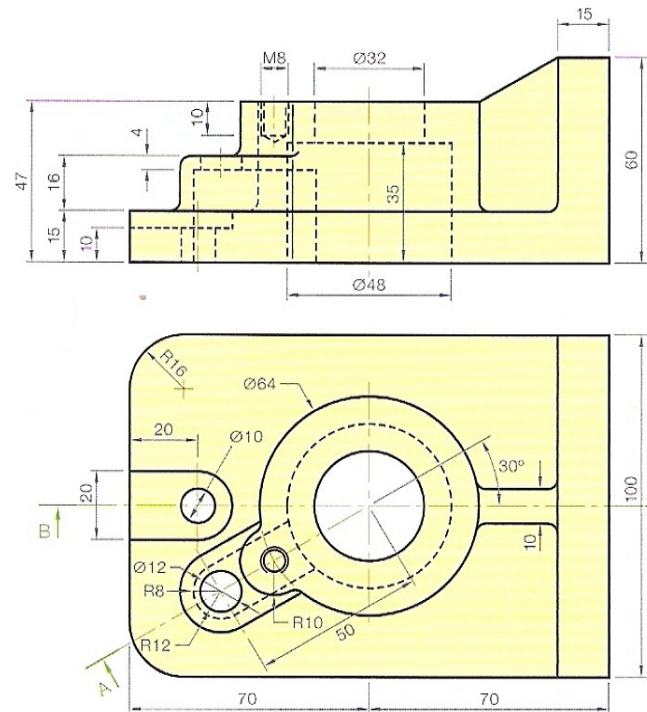
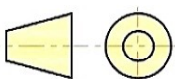
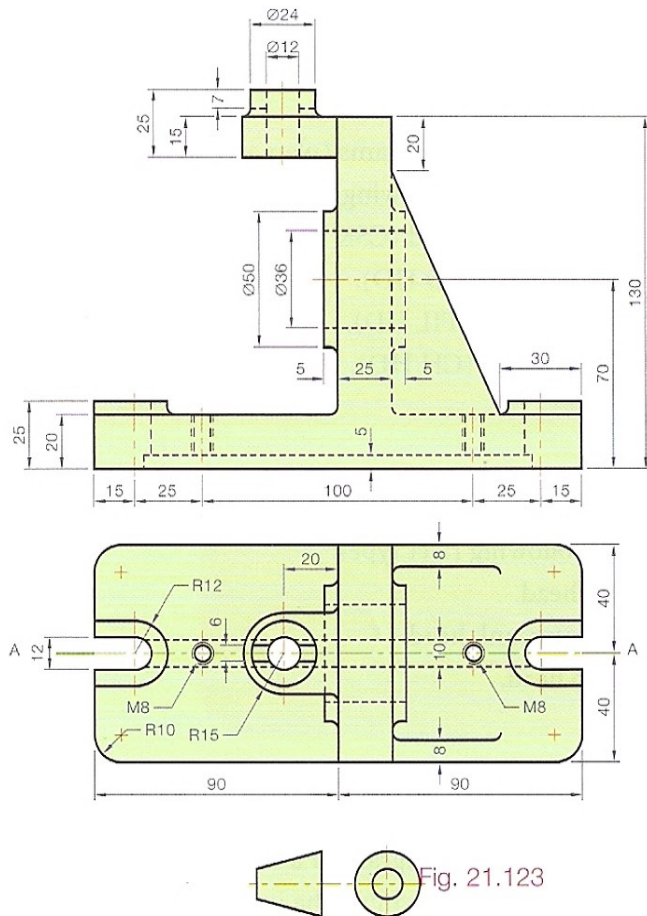


Fig. 21.122





Q15. The plan and elevation of a machine casting is shown in Fig. 21.123.

- Draw the given plan and project a sectional elevation on cutting plane A-A.
- Draw an isometric view of half of the casting, cut on the section plane.

SURFACE FINISHES

Q16. Draw a standard symbol used to show finish type and quality. Indicate on the symbol where the five categories of information are put:

- Machining allowance.
- Direction of lay.
- Method of treatment.
- Sampling length.
- Roughness value.

Q17. Explain the following three terms:

- Roughness value.
- Direction of lay.
- Method of treatment.

Q18. For each of the following finishes, draw the correct symbol.

- A sawn finish, laid perpendicular to the plane indicated, to a roughness number of N9.
- A milled finish, laid radially to the plane indicated, to a roughness number of N6.
- A polished finish, laid multi-directionally, to a roughness number of N3.
- A die cast finish to a roughness of 3.2 microns.
- A planed finish, laid parallel to the plane indicated, to a roughness number of N10.

FASTENING DEVICES

Q19. Using notes and diagrams explain the difference in appearance and use of:

- bolts,
- cap screws,
- set screws.

Q20. Make neat diagrams (plan and elevation) of the following cap screws:

- Countersunk head (CSK HD).
- Round head (RD HD).
- Fillister head (FIL HD).
- Cheese head (CH HD).

Q21. Make a neat diagram of four different methods of locking a nut to ensure it does not accidentally work loose.

Q22. Make a neat diagram of the following rivet types:

- Pan head.
- Countersunk head.
- Snap head.

Q23. 'If you want a strong joint you put in more rivets.' Is this statement always true? Give reasons for your answer.

Q24. Make a neat diagram of a welding symbol and indicate on the symbol the important parts.

Q25. Draw weld symbols for each of the following:

- (i) Single bevel weld with broad root, weld on arrow side.
- (ii) Fillet weld on far side, weld on site.
- (iii) Seam weld, double V weld.
- (iv) Spot weld, on site, square butt weld.
- (v) Plug weld on far side.
- (vi) J butt weld on far side.

ASSEMBLIES

Q26. Details of a Non-return Valve are given in Fig. 21.124b. The parts list is tabulated in Fig. 21.124a.

- (i) Draw a full sectional elevation of the assembly corresponding to the given sectional elevation of the body. The valve should be in the closed position.
- (ii) Insert:
 - The title 'NON-RETURN VALVE'.
 - Reference numbers to identify the parts.
 - Four leading dimensions.
 - ISO projection symbol.

Part No.	Name	Required
1	Body	1
2	Valve Seat	1
3	Valve	1
4	Cover	1
5	Seal	1

Fig. 21.124a

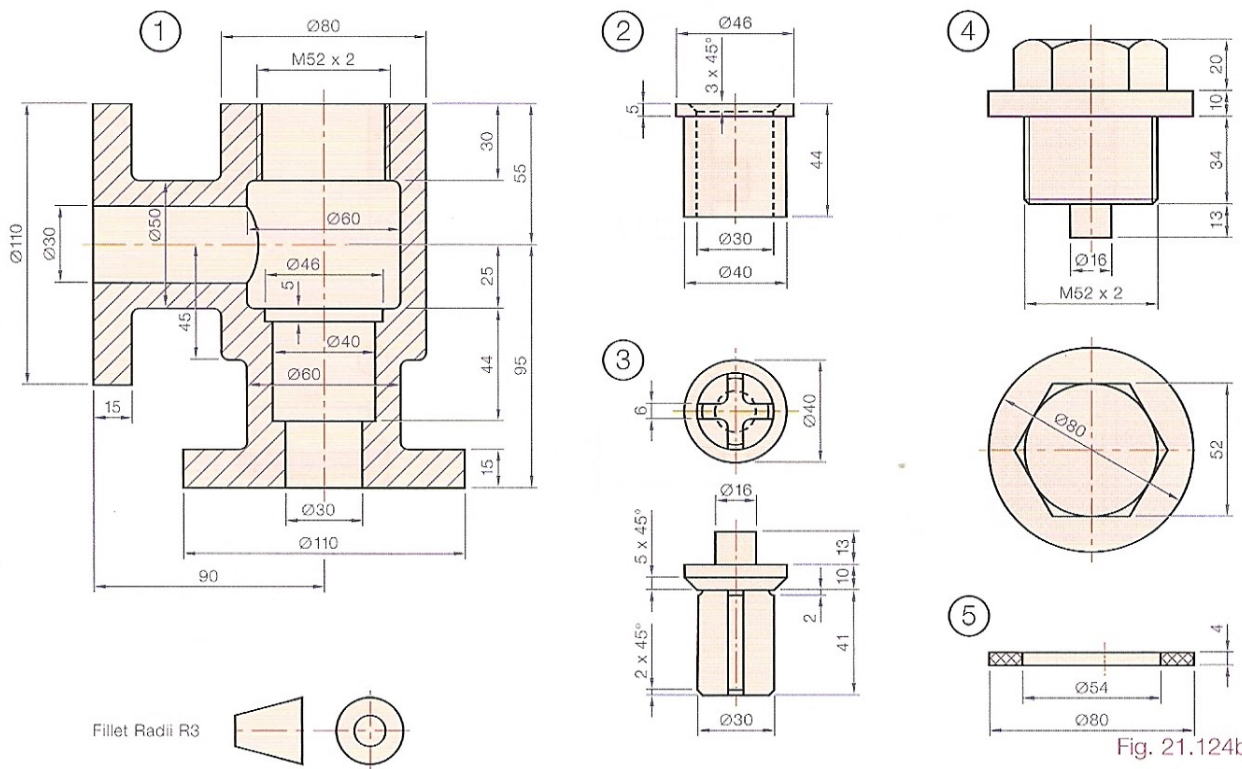


Fig. 21.124b

Q27. Details of a Welding Fixture are given in Fig. 21.125b with the parts list tabulated in Fig. 21.125a.

- (i) Draw a full-size sectional elevation S-S of the assembled parts.
- (ii) Insert:
 - Item reference numbers.
 - ISO projection symbol.
 - Title 'WELDING FIXTURE'.
 - Four leading dimensions.

Part No.	Description	Quantity
1	Body	1
2	Hinge	2
3	Jaw	2
4	Screw	2
5	Spindle	2
6	Circlip (not shown)	2

Fig.

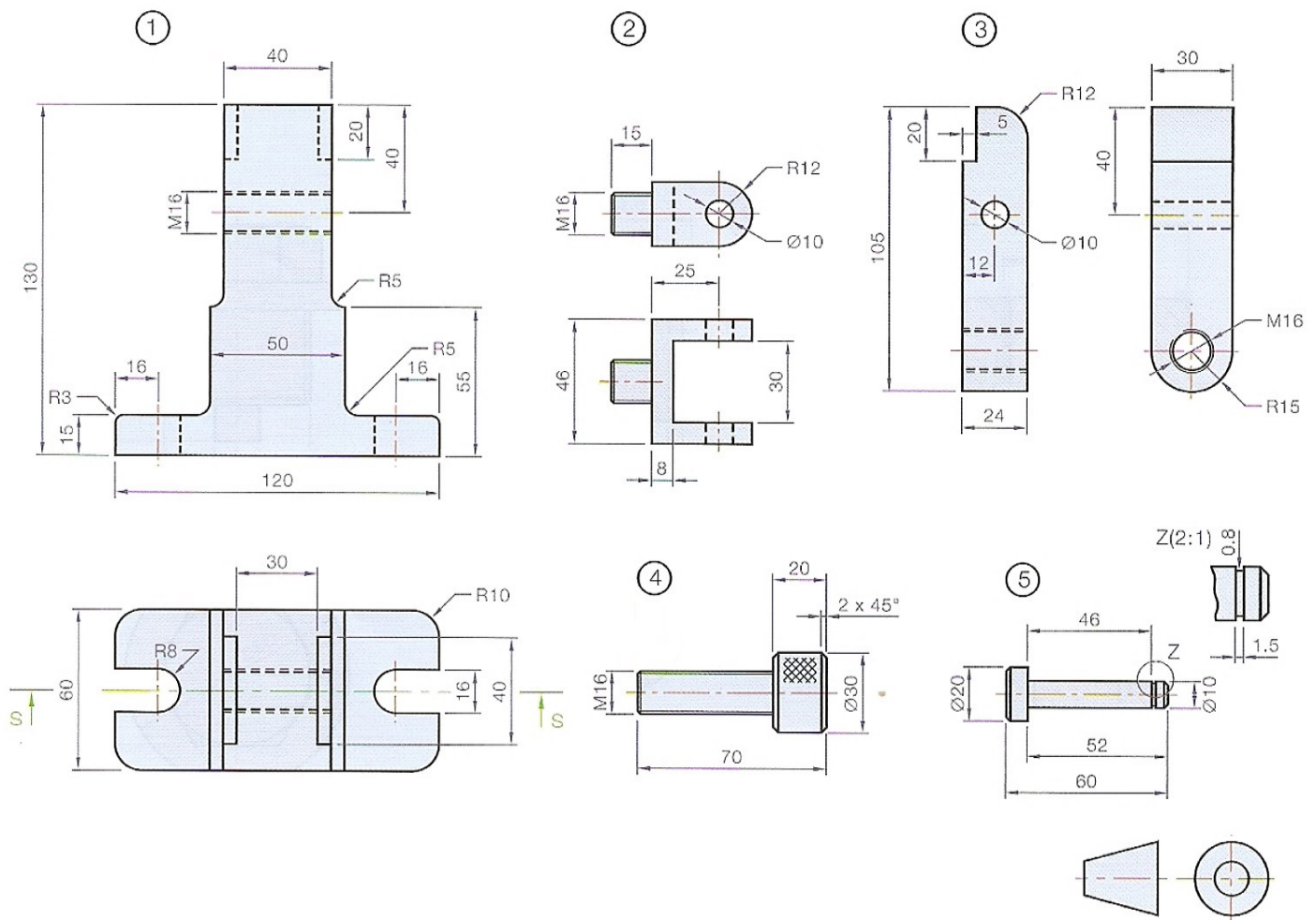


Fig. 21.125b

Q29. Fig. 21.127b shows details of a BRACKET AND GLAND ASSEMBLY. Draw the following views of the assembled pieces in first- or third-angle projection.

- (i) A sectional elevation as indicated at B–B.
- (ii) A sectional end view as indicated at C–C.
- (iii) Insert the following on the drawing:
 - The title ‘BRACKET AND GLAND ASSEMBLY’.
 - ISO projection symbol.
 - Four leading dimensions.

Part No.	Description	Re
1	Bracket	
2	Gland	
3	Packing	
4	Stud	

Fig.

H I G H E R
L E V E L

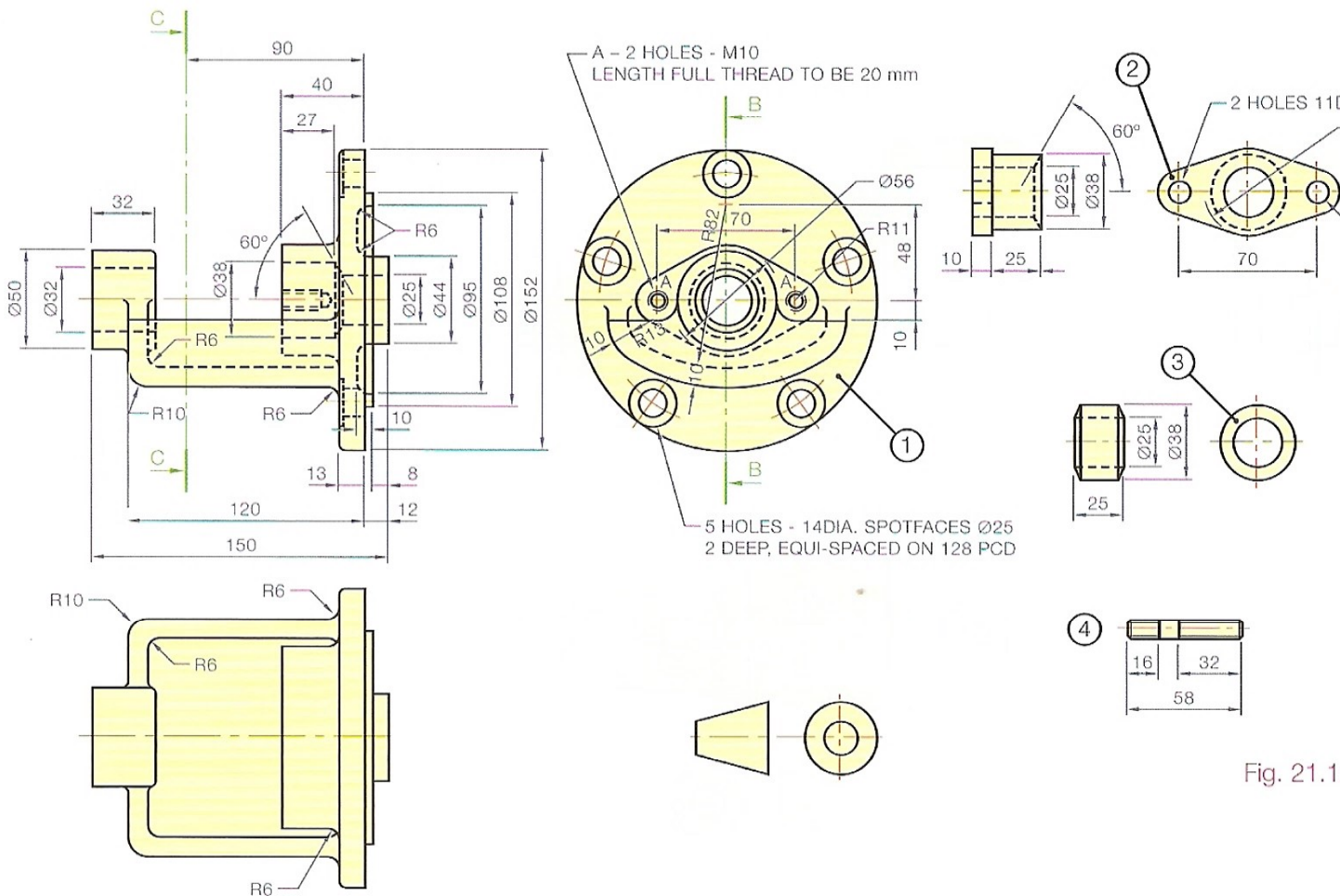


Fig. 21.1

Q30. Details of BENCH ROLLS are given in Fig. 21.128b. The parts list is tabulated in Fig. 21.128a.

- Draw a full-size sectional elevation A-A showing the parts assembled.
- Insert item reference numbers to identify the parts.
- Add the title 'BENCH ROLLS', the ISO projection symbol and four leading dimensions.

Part No.	Description	Required
1	Frame	1
2	Top roller	1
3	Bottom roller	1
4	Bottom bearing block	2
5	Top bearing block	2
6	Adjusting screw	2
7	Dowel	2

Fig. 21.128a

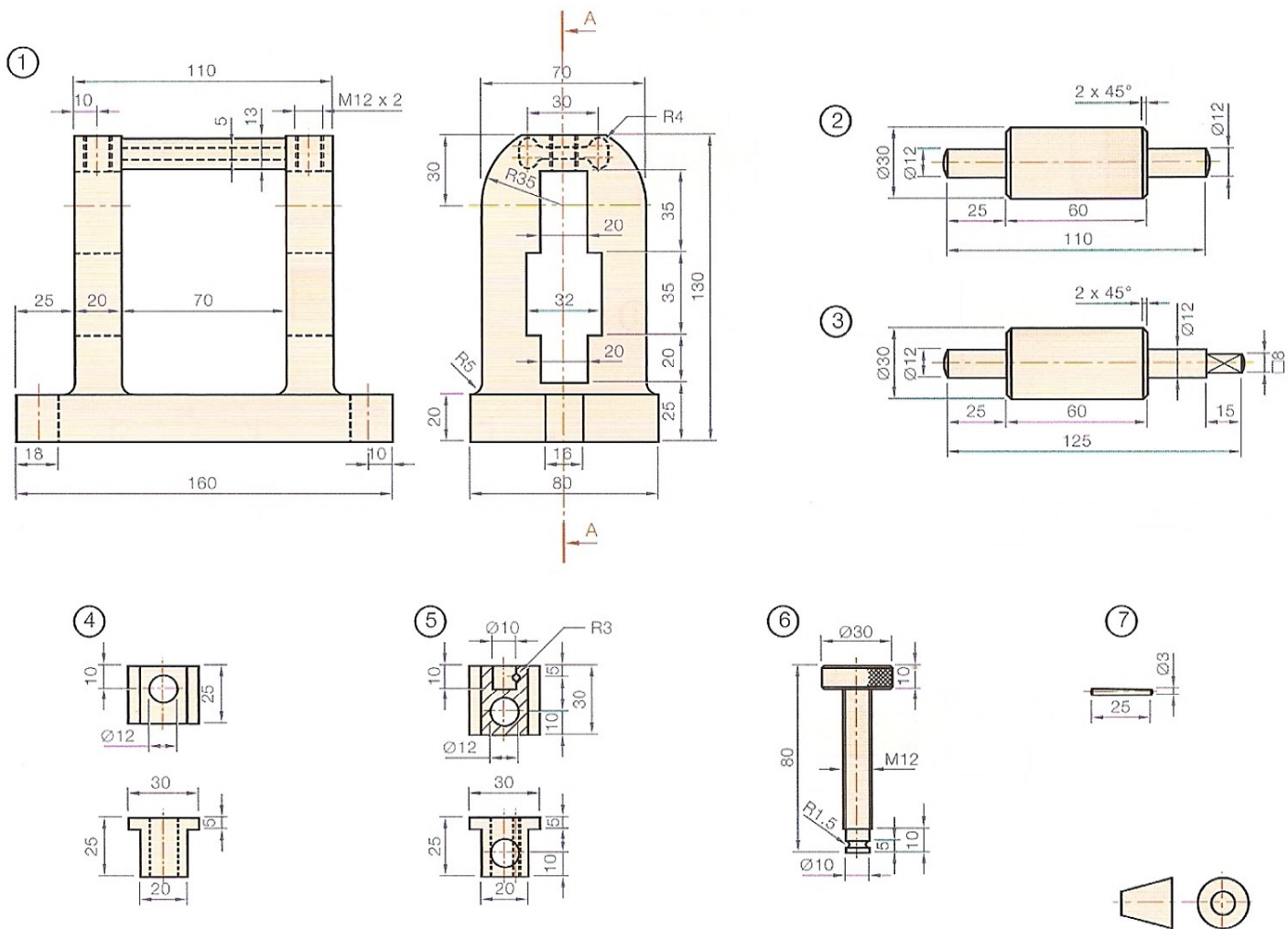


Fig. 21.128b

Q31. Details of a PIPE FLARING TOOL are shown in Fig. 21.129b with the parts list tabulated in Fig. 21.129a.

- (i) Draw an elevation of the assembly showing the working parts in section and flaring a copper pipe. Pipe dimensions: outside diameter 15 mm, inside diameter 12 mm.
- (ii) Balloon reference the parts and add the title 'FLARING TOOL ASSEMBLY'.

Part No.	Description	Required
1	Body	1
2	Half die	2
3	Die lock nut	1
4	Punch	1
5	Pressure screw	1
6	Handle	1

Fig. 21.129

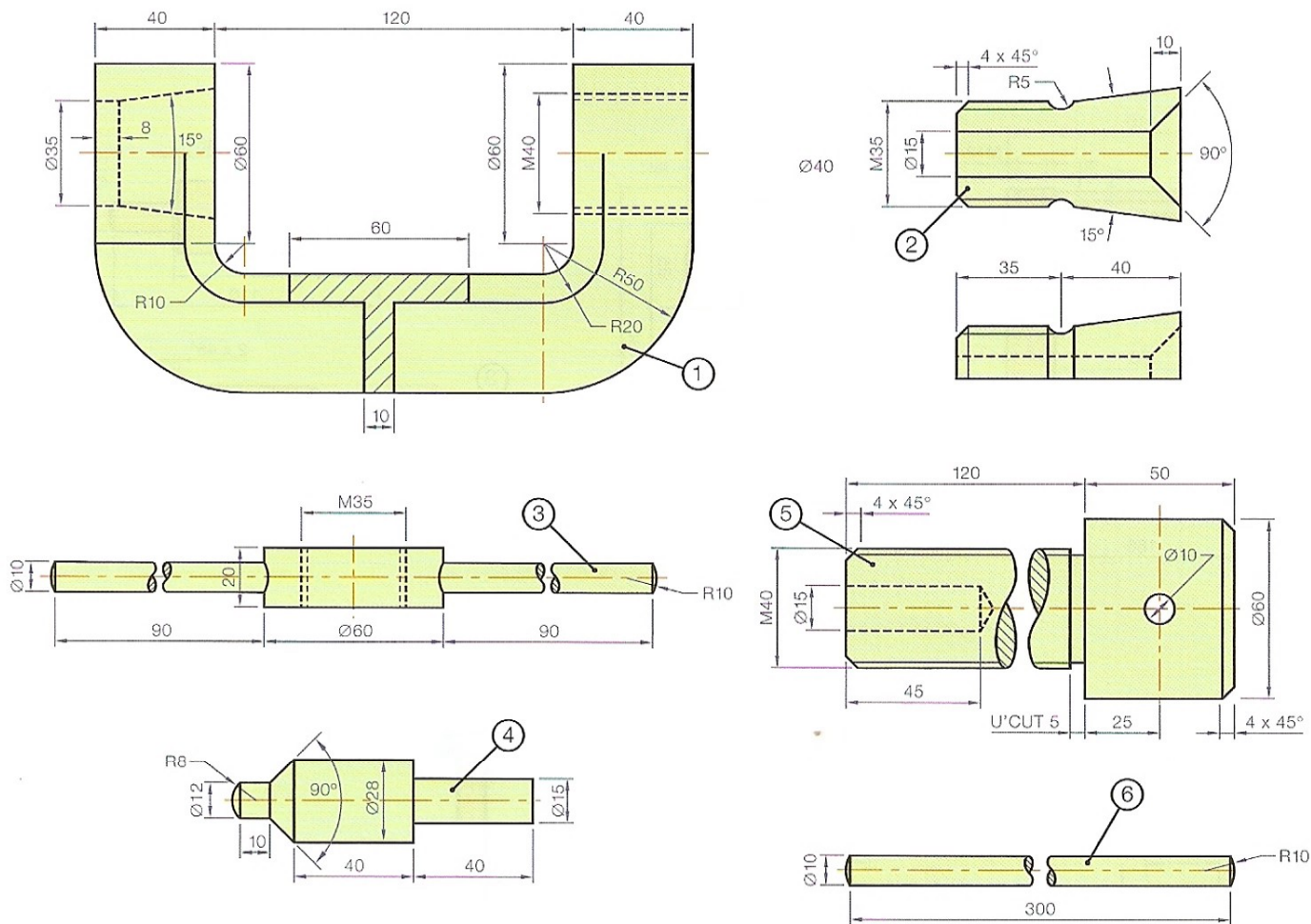


Fig. 21.129b

Q32. Details of a PIPE VICE are given in Fig. 21.130b with the parts list tabulated in Fig. 21.130a.

- (i) Draw a full-size sectional elevation on cutting plane A–A showing the parts completely assembled.
- (ii) Insert item reference numbers to identify the parts and add the title ‘PIPE VICE’.

Part No.	Description	Required
1	Body	1
2	Clamping screw	1
3	Sliding vee	1
4	Securing screw	1

Fig. 21.130a

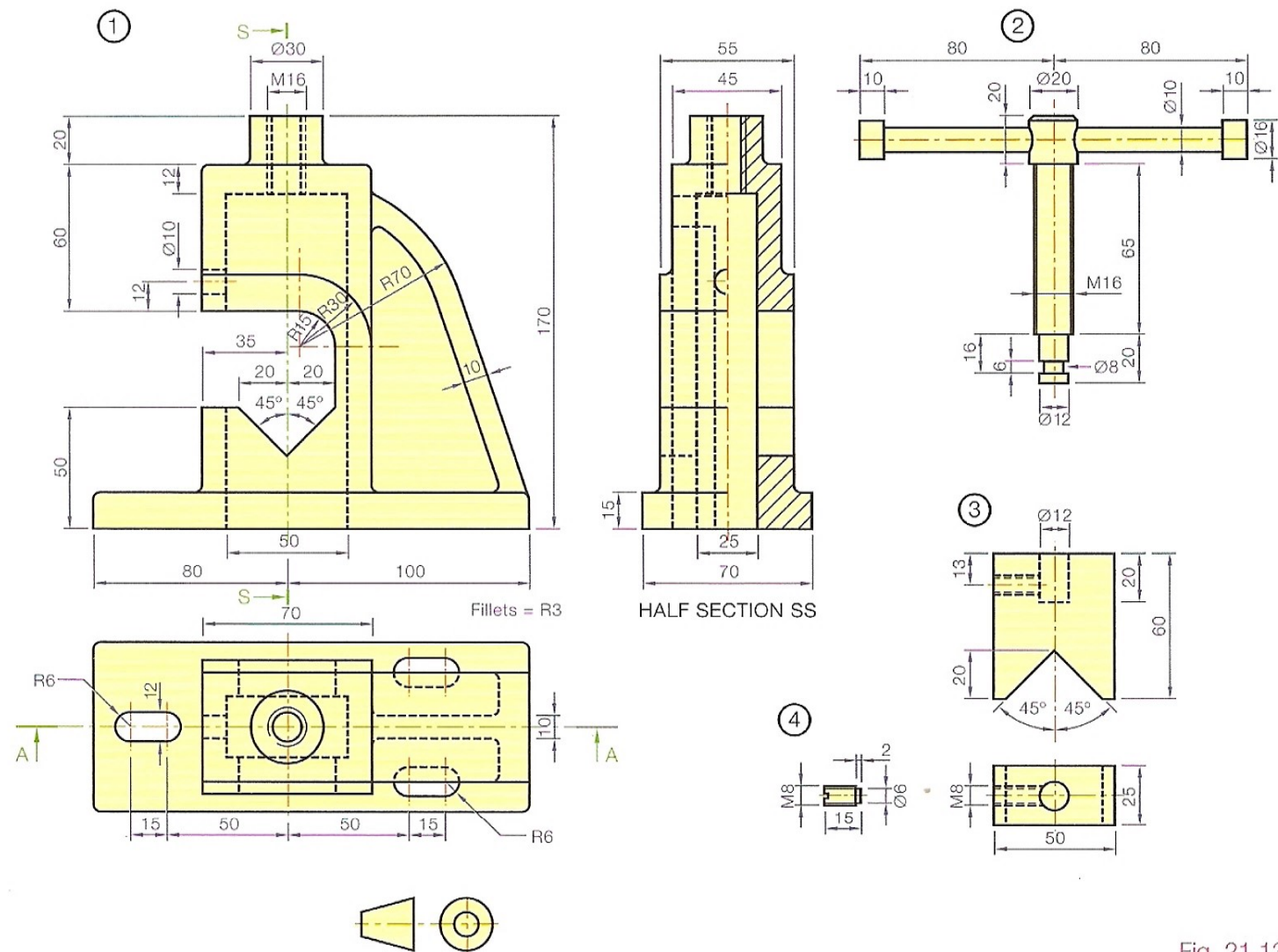


Fig. 21.130b