

**IES COLLEGE OF TECHNOLOGY, BHOPAL**

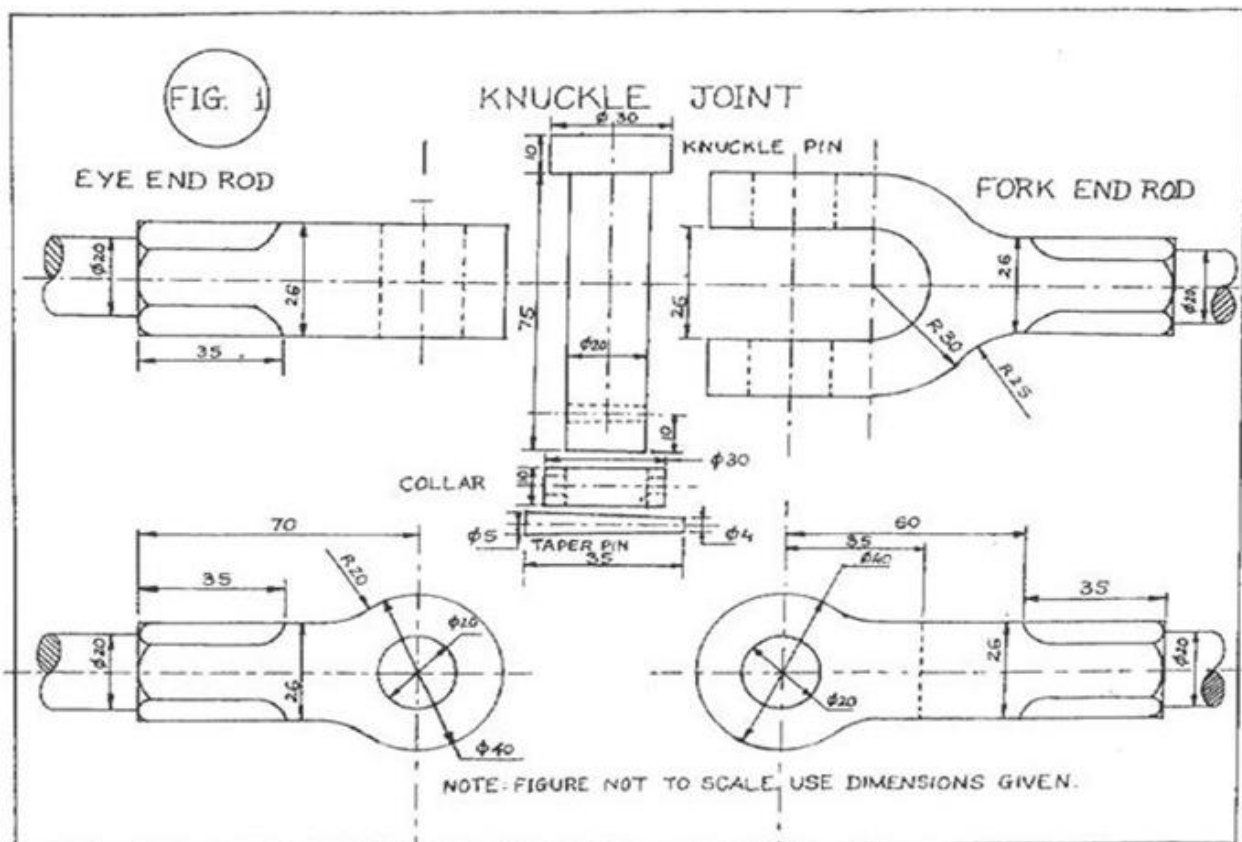
**B.E. (3<sup>rd</sup> SEM) ASSIGNMENT**

**Machine Design and drawing (ME-305) SET-A**

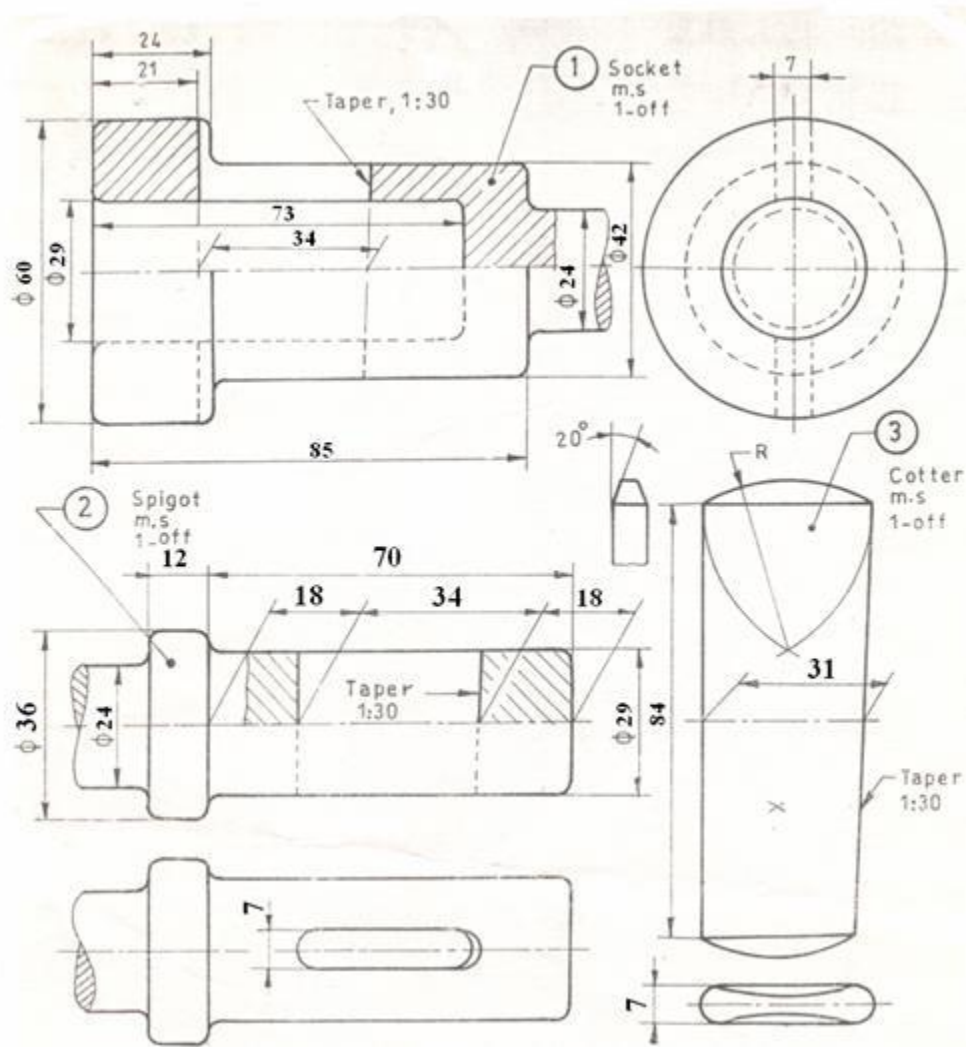
**LAST DATE OF SUBMISSION 27/10/2014**

**Assemble the sectional front view and top view of drawings,  
which are given following... .(Q. NO. 1 TO 7)**

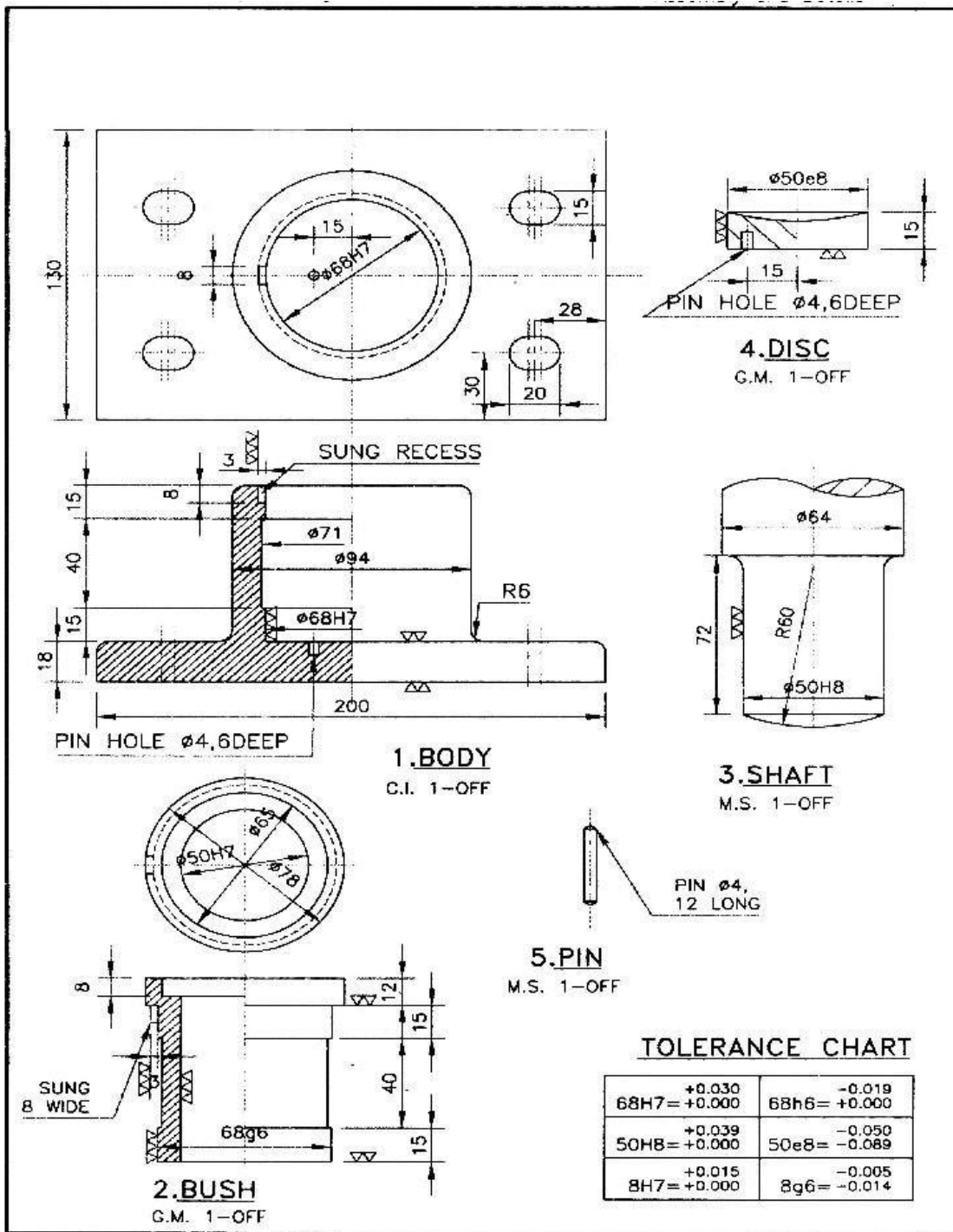
Q. NO. 1



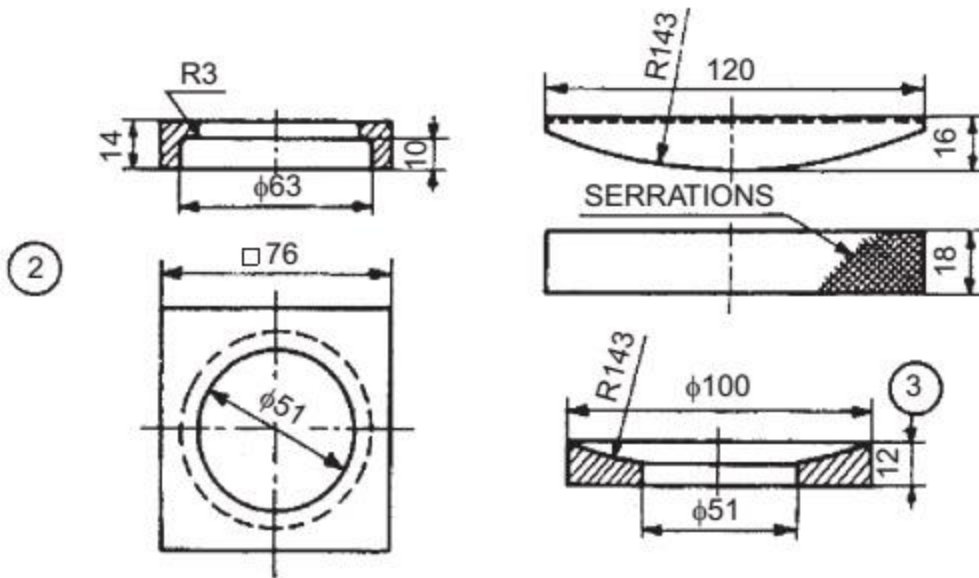
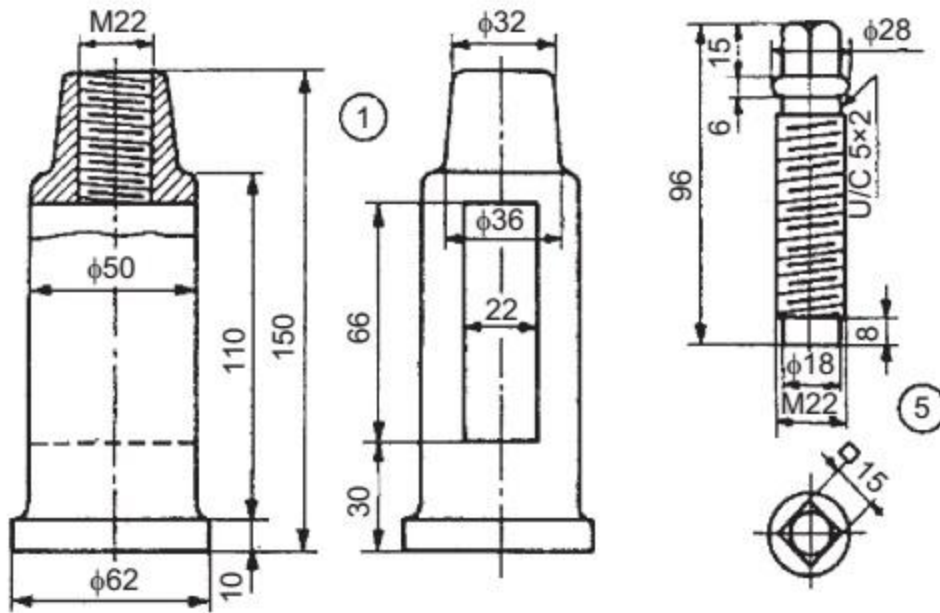
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Q. NO. 3

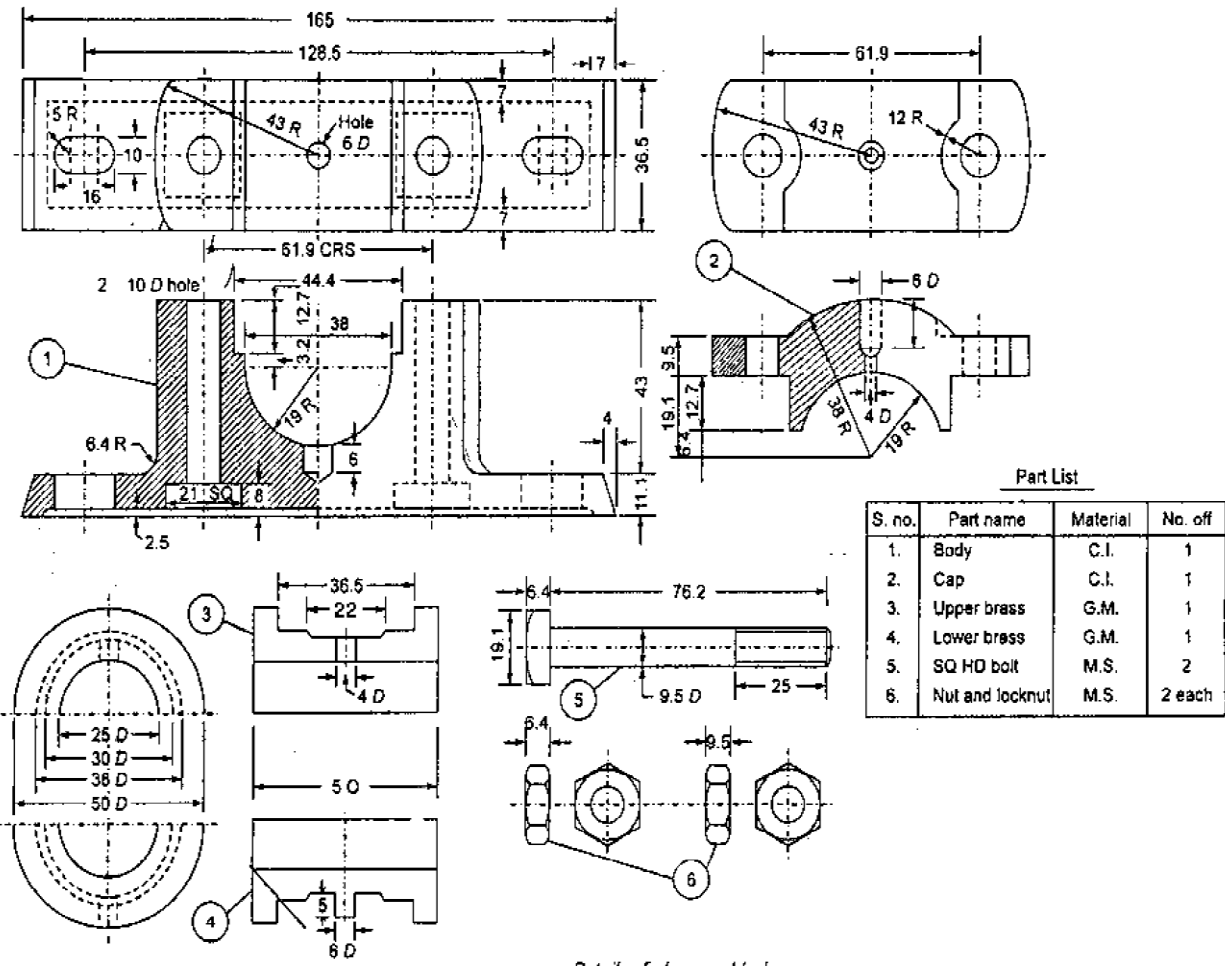


Q. NO. 4

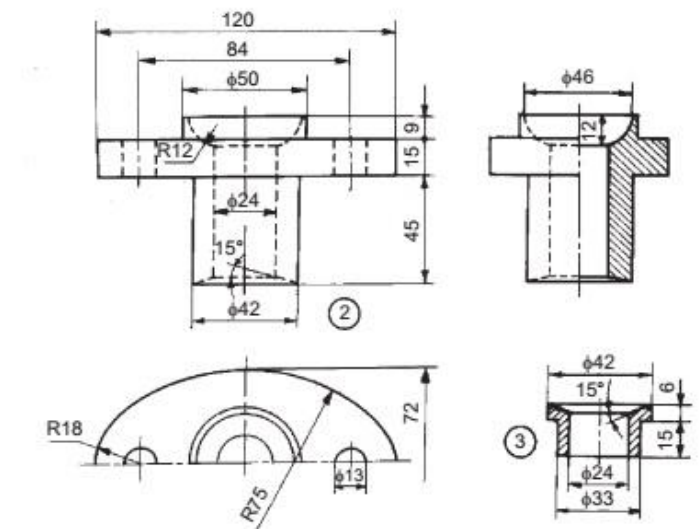
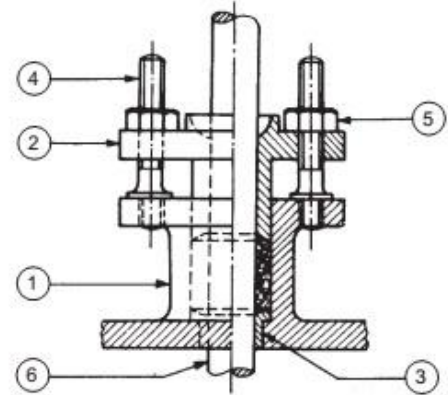
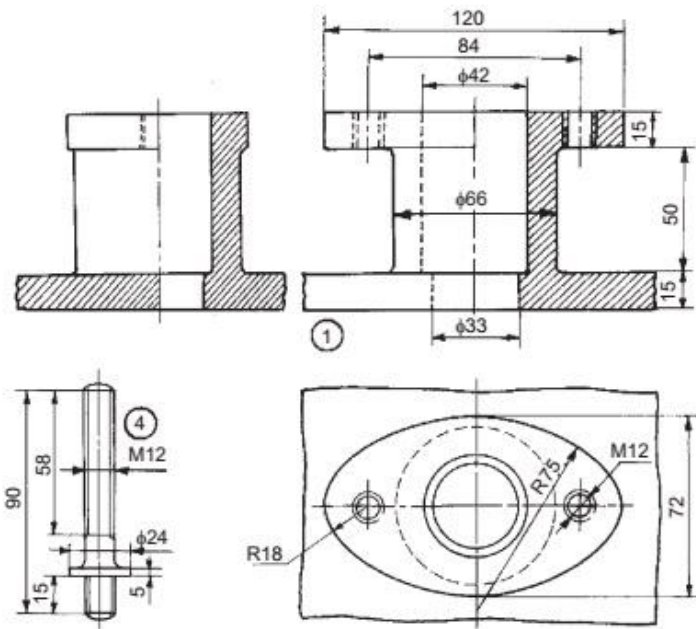


Parts list

No.	Name	Matl	Qty
1	Pillar	MCS	1
2	Block	MCS	1
3	Ring	MS	1
4	Wedge	MCS	1
5	Screw	TS	1



Details of plummer block

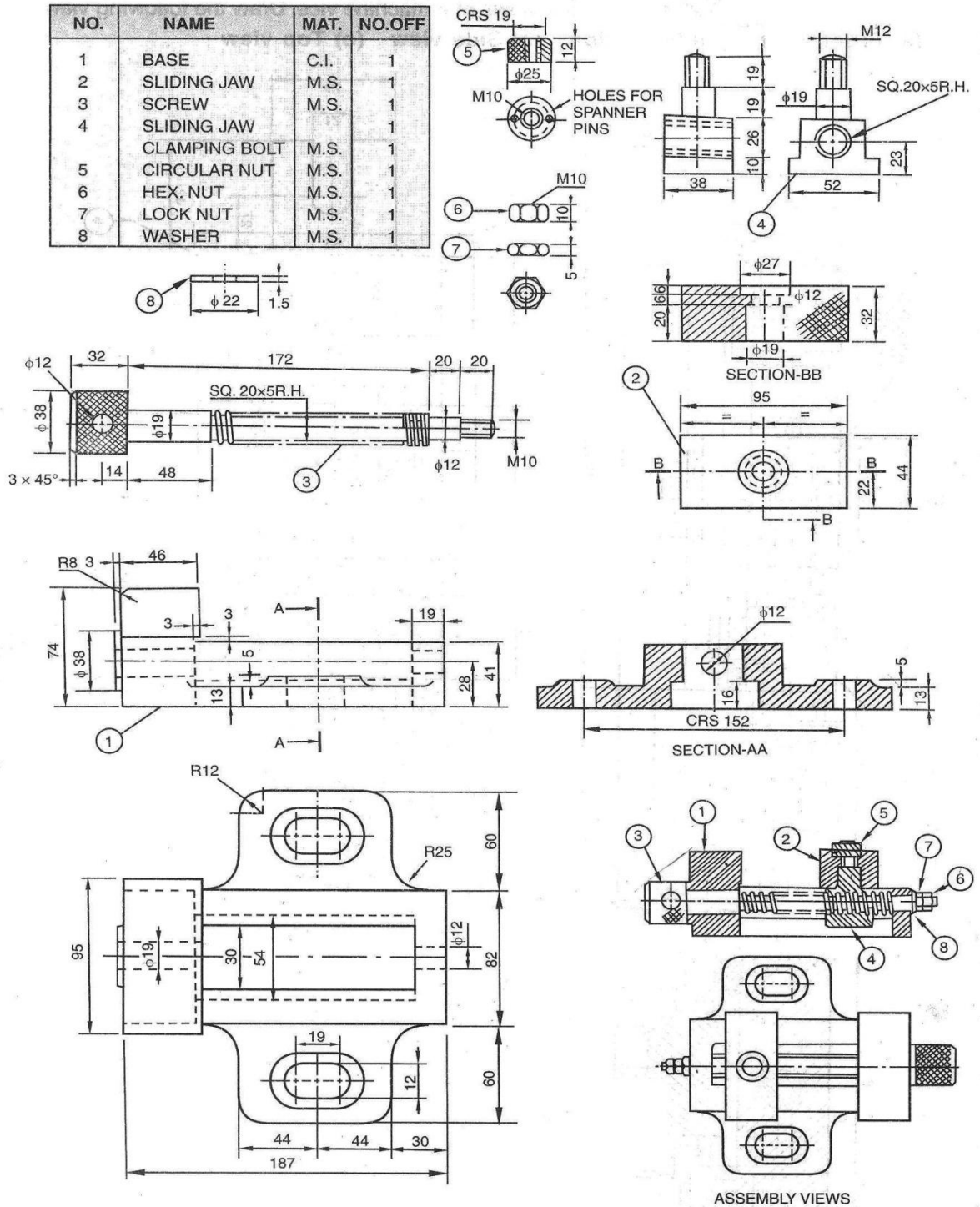


Parts list

Part No.	Name	Matl	Qty
1	Body	CI	1
2	Gland	Brass	1
3	Bush	Brass	1
4	Stud	MS	2
5	Nut, M12	MS	2

Q. NO. 7

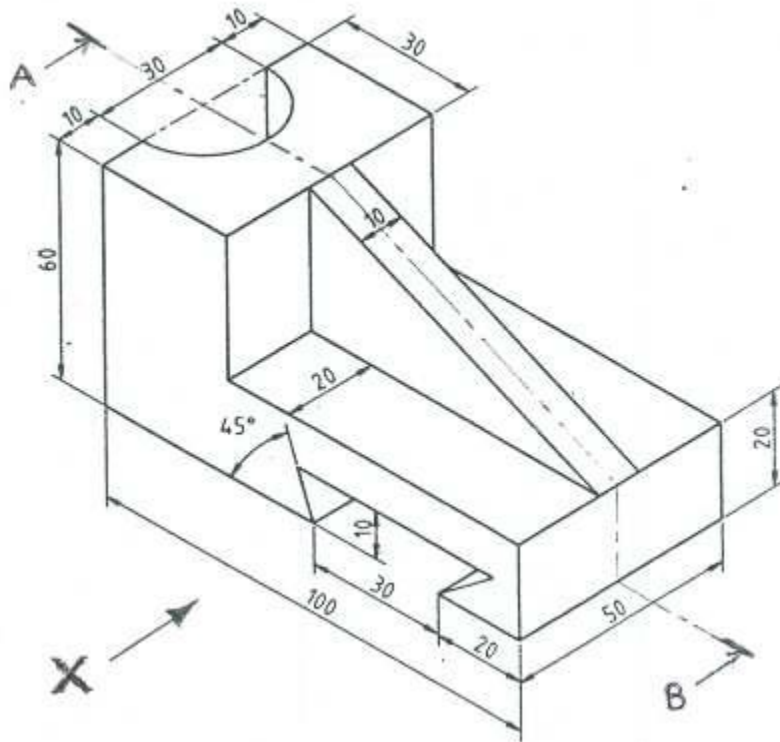
NO.	NAME	MAT.	NO.OFF
1	BASE	C.I.	1
2	SLIDING JAW	M.S.	1
3	SCREW	M.S.	1
4	SLIDING JAW CLAMPING BOLT	M.S.	1
5	CIRCULAR NUT	M.S.	1
6	HEX. NUT	M.S.	1
7	LOCK NUT	M.S.	1
8	WASHER	M.S.	1



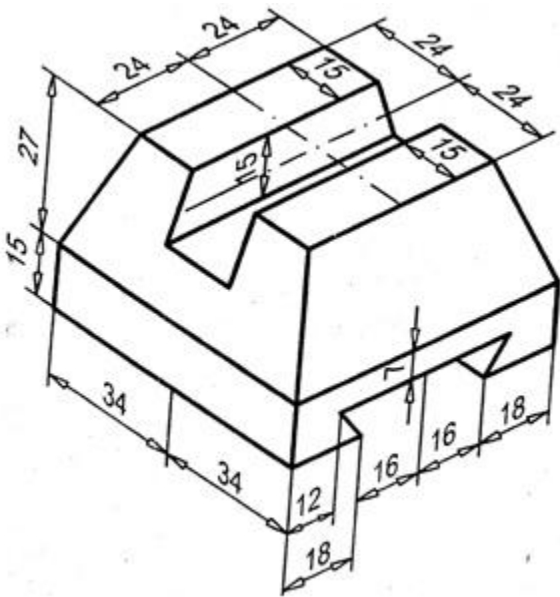
Details of a machine vice

**Draw the sectional front view side view and top view of given orthographic projections... ( Q. NO. 08 TO... 14)**

Q. NO. 8

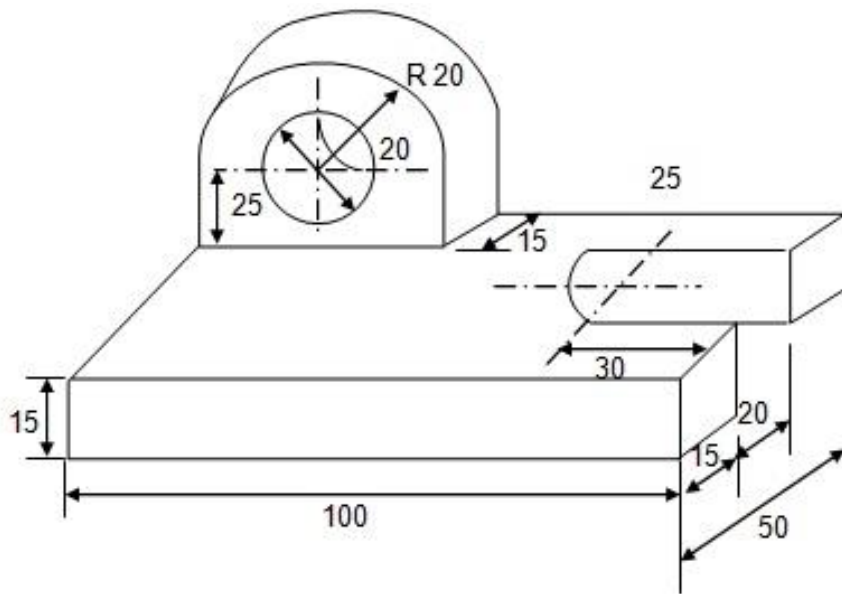


Q. NO.9

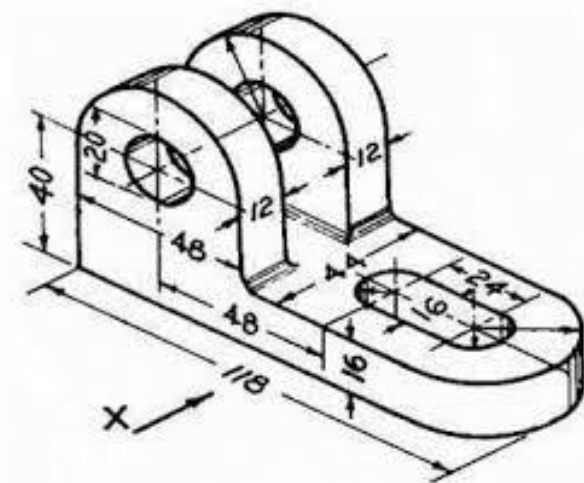


Q. NO.10

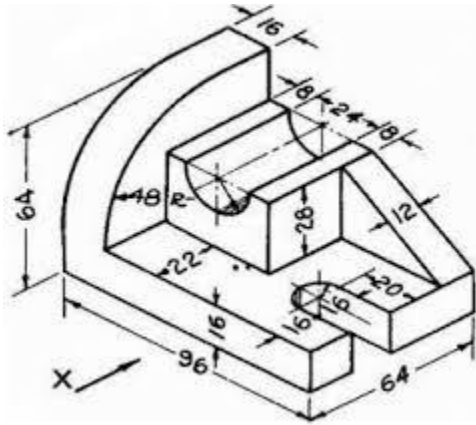




Q. NO.11



Q. NO 12



Q. NO. 13

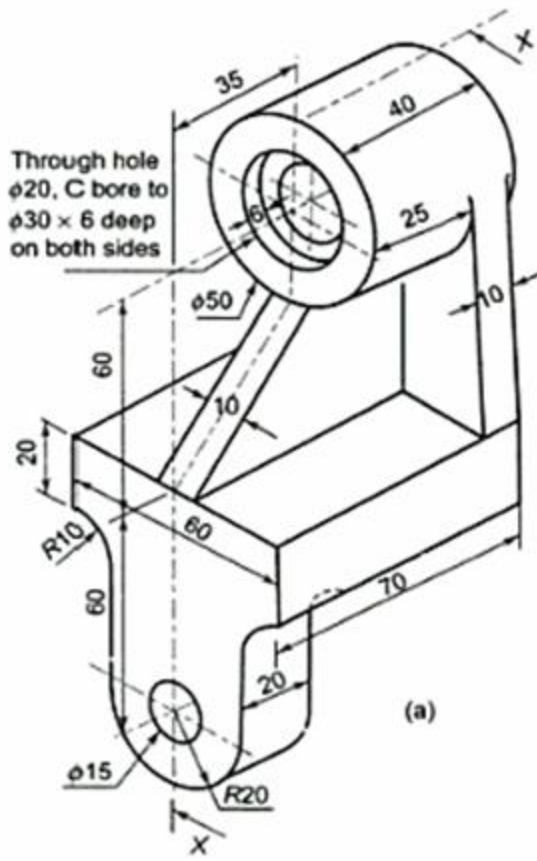


Fig. 3

Q. NO.14

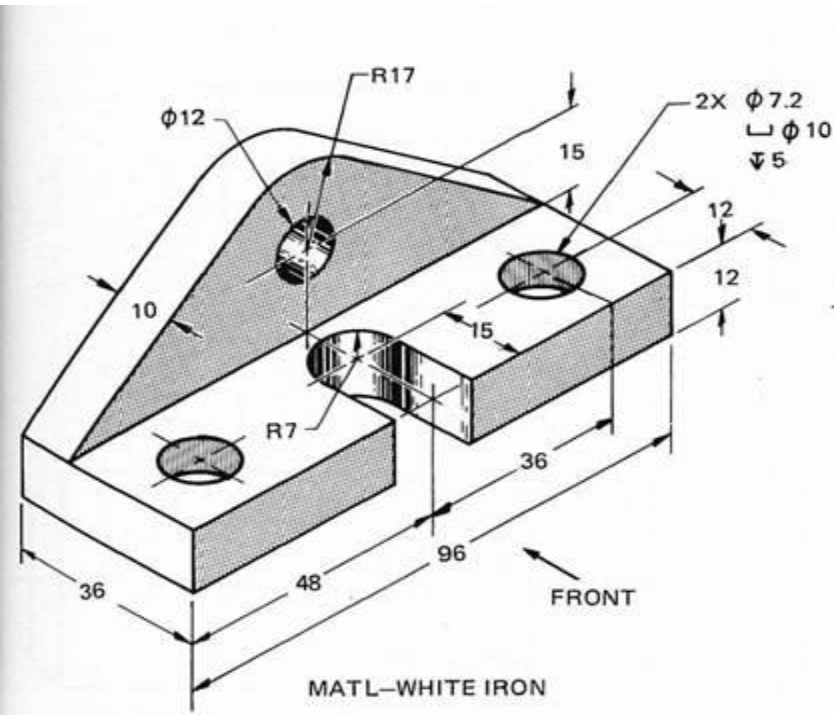


Figure 4-2-E Yoke

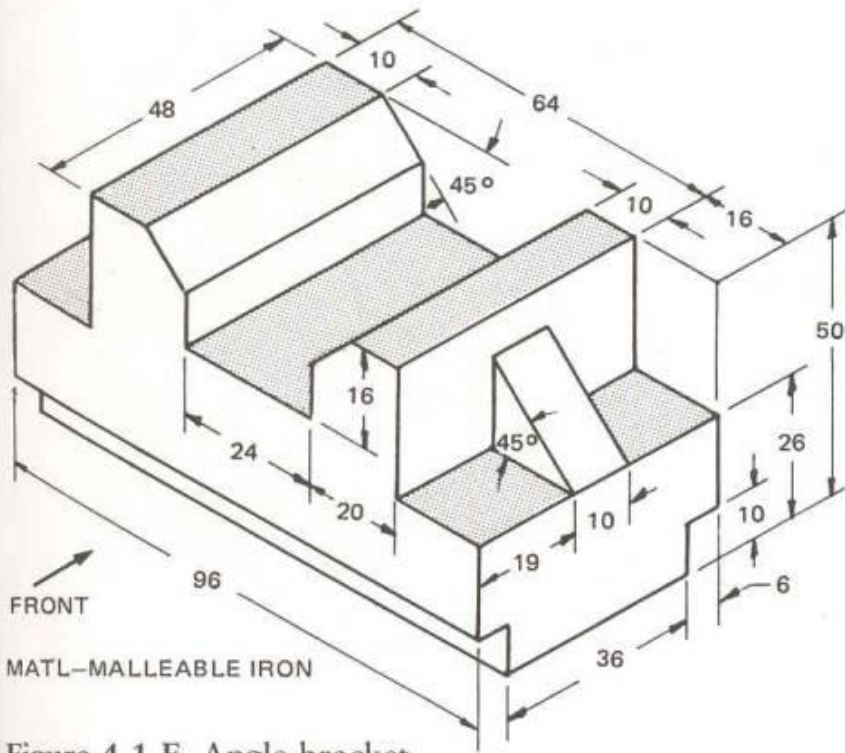
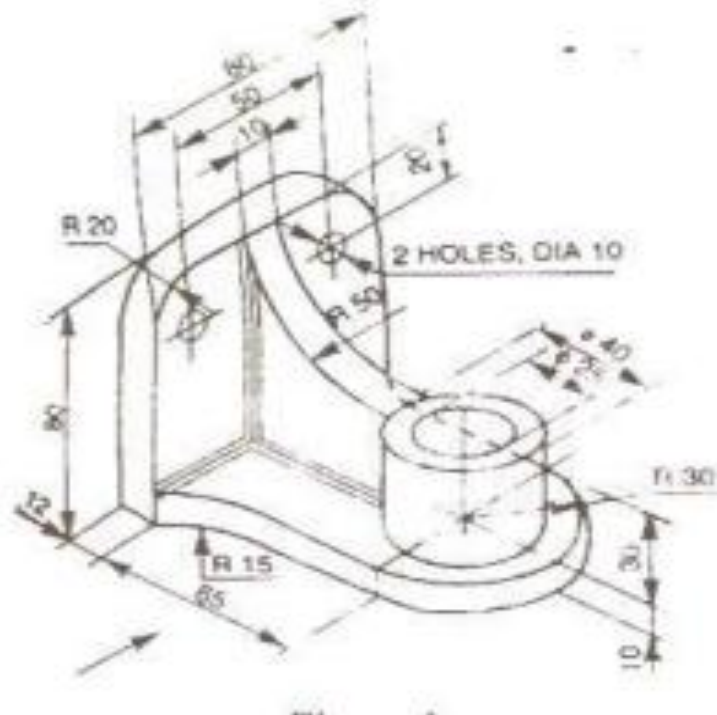


Figure 4-1-E Angle bracket

Q. NO. 15



**Solve the following numerical problems...(Q. NO. 16 TO...23)**

Q. NO.16

Design a knuckle joint to connect two rods which transmits a tensile load 50 kN. Working stress 80 MPa and 40 MPa in compression, tension and shear respectively. 14

Q. NO.17

Design a cotter joint to connect two mild steel rods. The joint is subjected to a 20KN tensile force. The allowable limits of tensile shear and crushing strengths are 60N/mm<sup>2</sup>, 40N/mm<sup>2</sup> and 75N/mm<sup>2</sup> respectively.

Q. NO. 18

A triple riveted lap joint is to be made between 6.5mm thick plates. Permissible values of stresses for plate and rivets are  $\sigma_t = 40\text{MPa}$ ,  $\sigma_s = 25\text{MPa}$ ,  $\sigma_c = 55\text{MPa}$  Using Zig-zag riveting, design joint and show dimensions on a sketch.

Q. NO.19

Design a Knuckle joint to connect two mild steel rods which transmit a tensile force of 25 kN. The safe working stresses for tension, shear and crushing are  $100 \text{ N/mm}^2$ ,  $160 \text{ N/mm}^2$  and  $160 \text{ N/mm}^2$  respectively. 14

Q. NO.20

Two mild steel tie rods having width 200 mm and thickness 12.5 mm are to be connected by means of a bolt joint with double cover plates. Design and draw the joint. Allowable stresses for mild steel for tension, shear and crushing are  $120 \text{ N/mm}^2$ ,  $85 \text{ N/mm}^2$  and  $240 \text{ N/mm}^2$  respectively. 14

Q. NO.21

Design riveted joints for the longitudinal seams of a boiler having 1.20 m dia. to withstand maximum pressure of  $2.5 \text{ N/mm}^2$ . The material of the shell plate and rivet is C20 having the following allowable stresses : 20

$$\sigma_t = 86 \text{ N/mm}^2$$

$$\sigma_c = 129 \text{ N/mm}^2$$

$$\tau_s = 52 \text{ N/mm}^2$$

Q. NO. 22

Design a knuckle joint to connect two mild steel rods which transmits a tensile force of 28 kN. The safe working stresses for tension, shear and crushing are  $100 \text{ N/mm}^2$ ,  $65 \text{ N/mm}^2$  and  $150 \text{ N/mm}^2$  respectively. 20

Q. NO.23

Design longitudinal joint for a boiler whose inner dia. is 1675 mm and steam pressure is  $2 \text{ N/mm}^2$ . The joint is to be triple riveted butt joint. The pitch in the outer row is to be twice that in the inner rows and only inner cover plate covers the outer rows. The permissible stresses are : 14

$$\sigma_t = 90 \text{ MPa}$$

$$\sigma_c = 150 \text{ MPa}$$

$$\tau_s = 75 \text{ MPa}$$