



**GOVERNMENT ENGINEERING COLLEGE
MECHANICAL ENGINEERING DEPARTMENT**

Session: IV SEMESTER AY: 2018-19

Course teachers: Prof. R. I. PATEL, Prof. S.A. SHAH
Prof B. N. GELOT, Prof. P.J. PATEL

LAB MANUAL
MACHINE DESIGN & INDUSTRIAL DRAFTING
SUBJECT CODE :- 2141907

PART-I

1. The details of a lathe square tool post are shown in Fig. 1. Assemble the parts and draw, (i) Sectional view from the front and (ii) view from above.
(For Batch:4MA1)

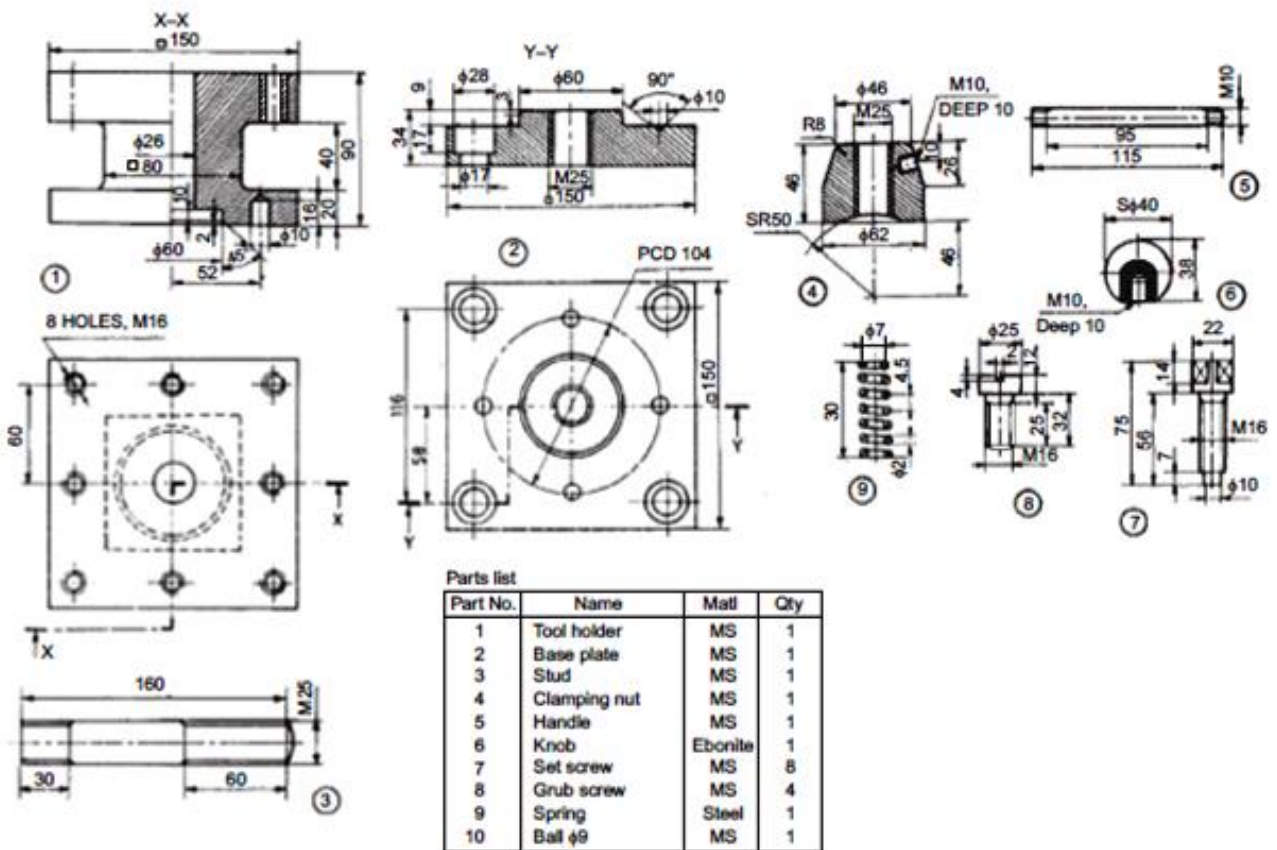


Fig.1



**GOVERNMENT ENGINEERING COLLEGE
MECHANICAL ENGINEERING DEPARTMENT**

Session: IV SEMESTER AY: 2018-19

Course teachers: Prof. R. I. PATEL, Prof. S.A. SHAH
Prof B. N. GELOT, Prof. P.J. PATEL

2. Figure 2 shows the details of a machine vice. Assemble the parts and draw, (i) sectional view from the front, (ii) view from above and (iii) view from the left. Use suitable scale. (For Batch: 4MA2)

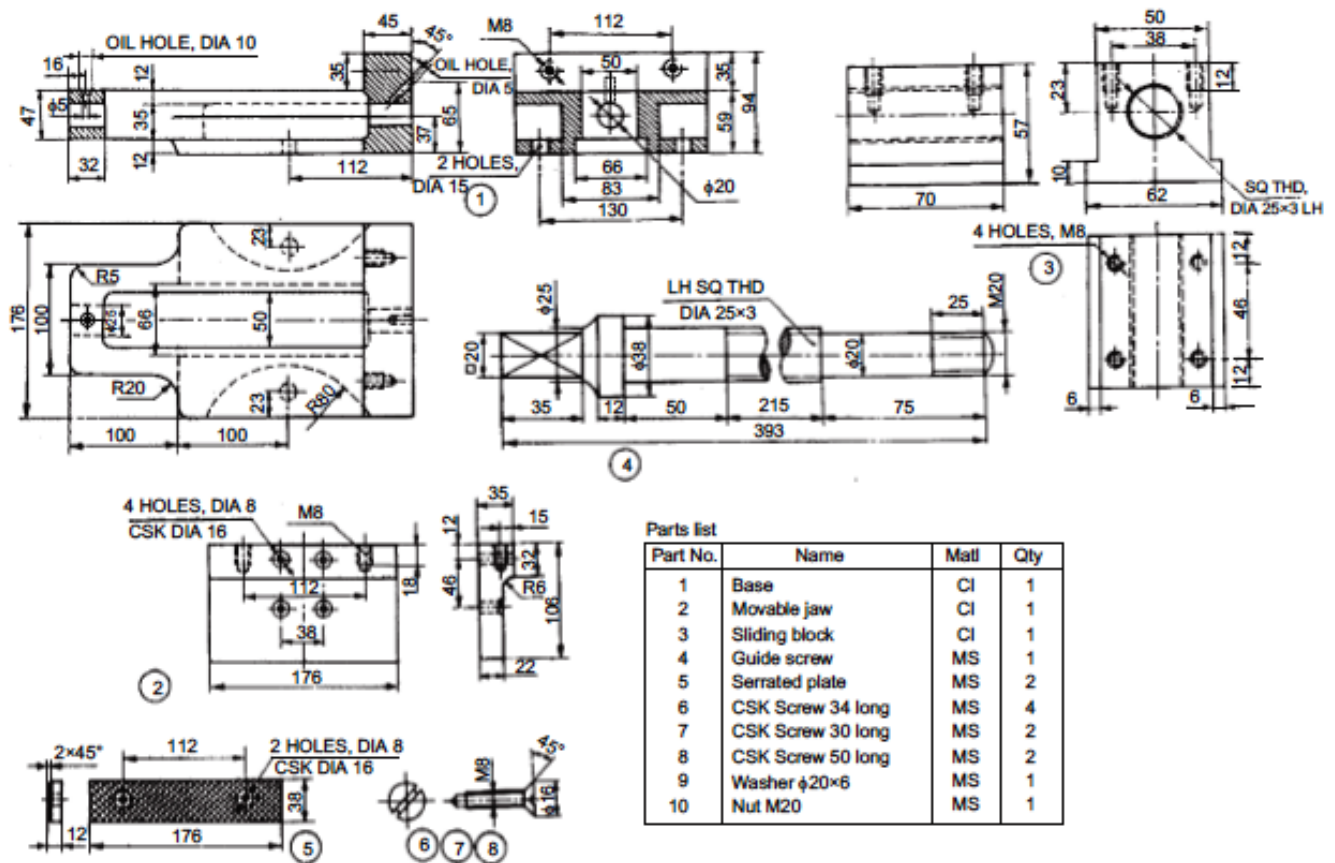


Fig.2

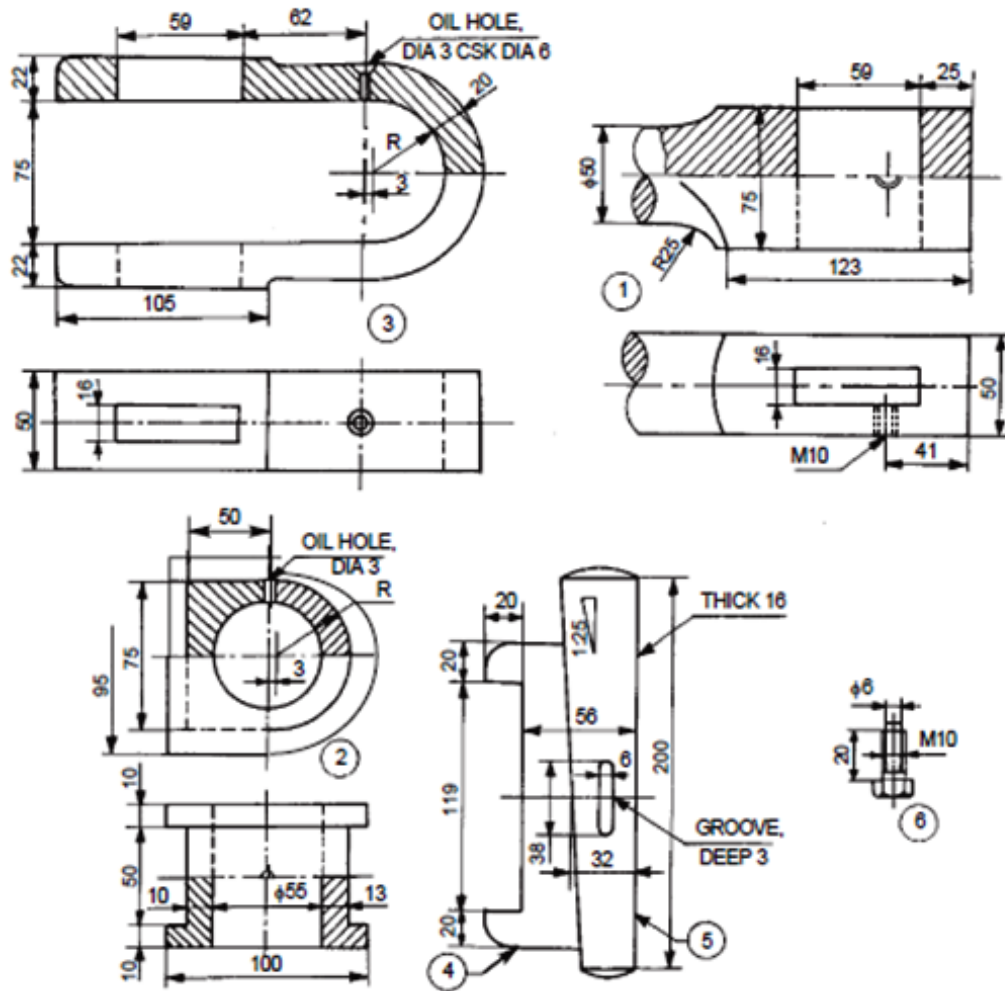


GOVERNMENT ENGINEERING COLLEGE
MECHANICAL ENGINEERING DEPARTMENT

Session: IV SEMESTER AY: 2018-19

Course teachers: Prof. R. I. PATEL, Prof. S.A. SHAH
Prof B. N. GELOT, Prof. P.J. PATEL

3. The components of a steam engine connecting rod end are shown in Fig. 3. Assemble the parts and draw, (i) half sectional view from the front, with top half in section and (ii) view from above. (For Batch: 4MA3)



Parts list

Sl. No.	Name	Matl.	Qty.
1	Connecting rod	FS	1
2	Brasses	GM	2
3	Strap	MS	1
4	Jib	MS	1
5	Cotter	MCS	1
6	Set screw	MCS	1

Fig.3



**GOVERNMENT ENGINEERING COLLEGE
MECHANICAL ENGINEERING DEPARTMENT**

Session: IV SEMESTER AY: 2018-19

Course teachers: Prof. R. I. PATEL, Prof. S.A. SHAH
Prof B. N. GELOT, Prof. P.J. PATEL

4. Assemble the parts of a spring loaded relief valve, shown in Fig. 4 and draw the following views: (i) Sectional view from the front, and (ii) View from the right.
(For Batch: 4MB1)

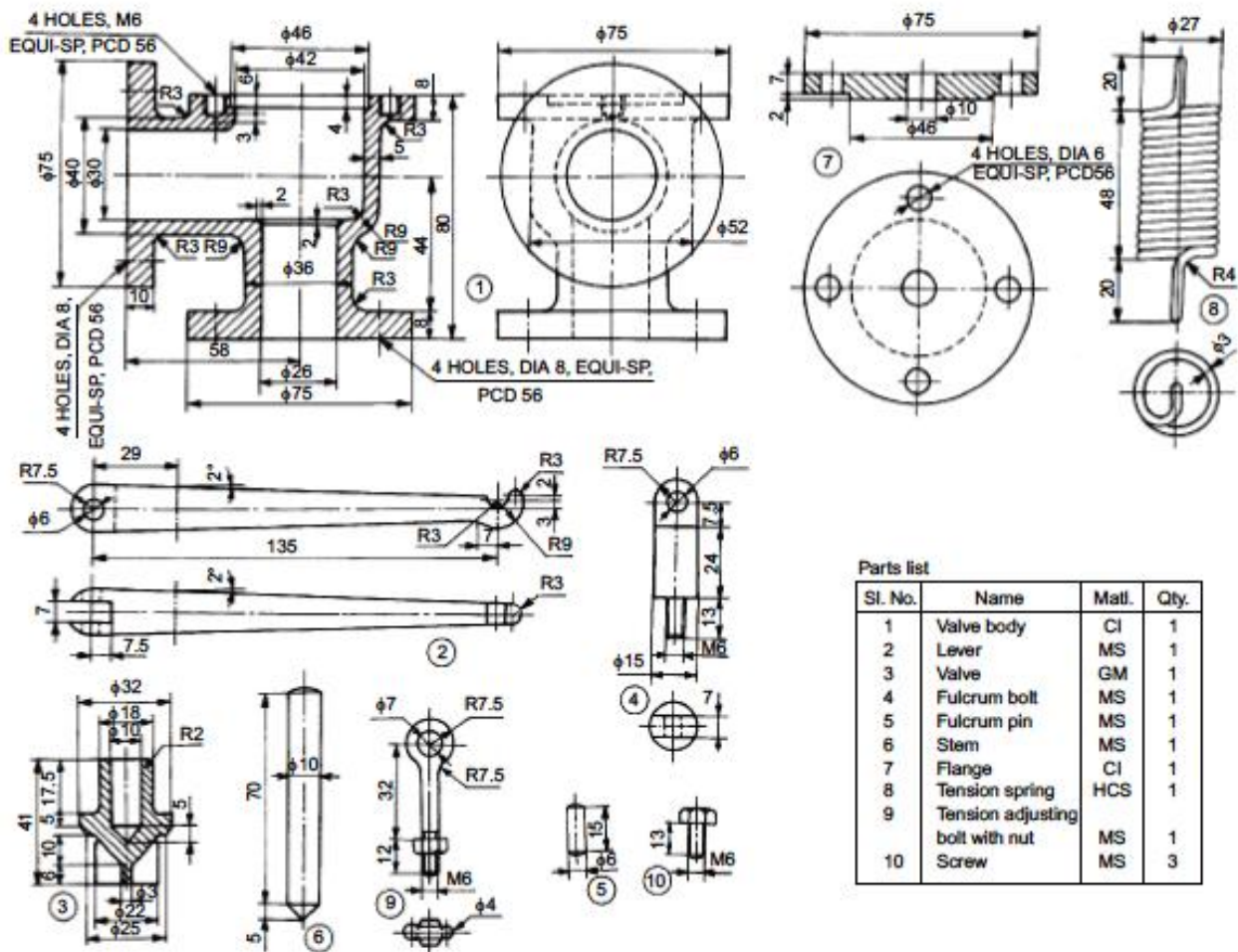


Fig.4



**GOVERNMENT ENGINEERING COLLEGE
MECHANICAL ENGINEERING DEPARTMENT**

Session: IV SEMESTER AY: 2018-19

Course teachers: Prof. R. I. PATEL, Prof. S.A. SHAH
Prof B. N. GELOT, Prof. P.J. PATEL

5. Assemble the parts of the plummer block, shown in Fig. 5 and draw the following views: (i) Half sectional view from the front, with left half in section, and (ii) View from above. (**For Batch: 4MB2**)

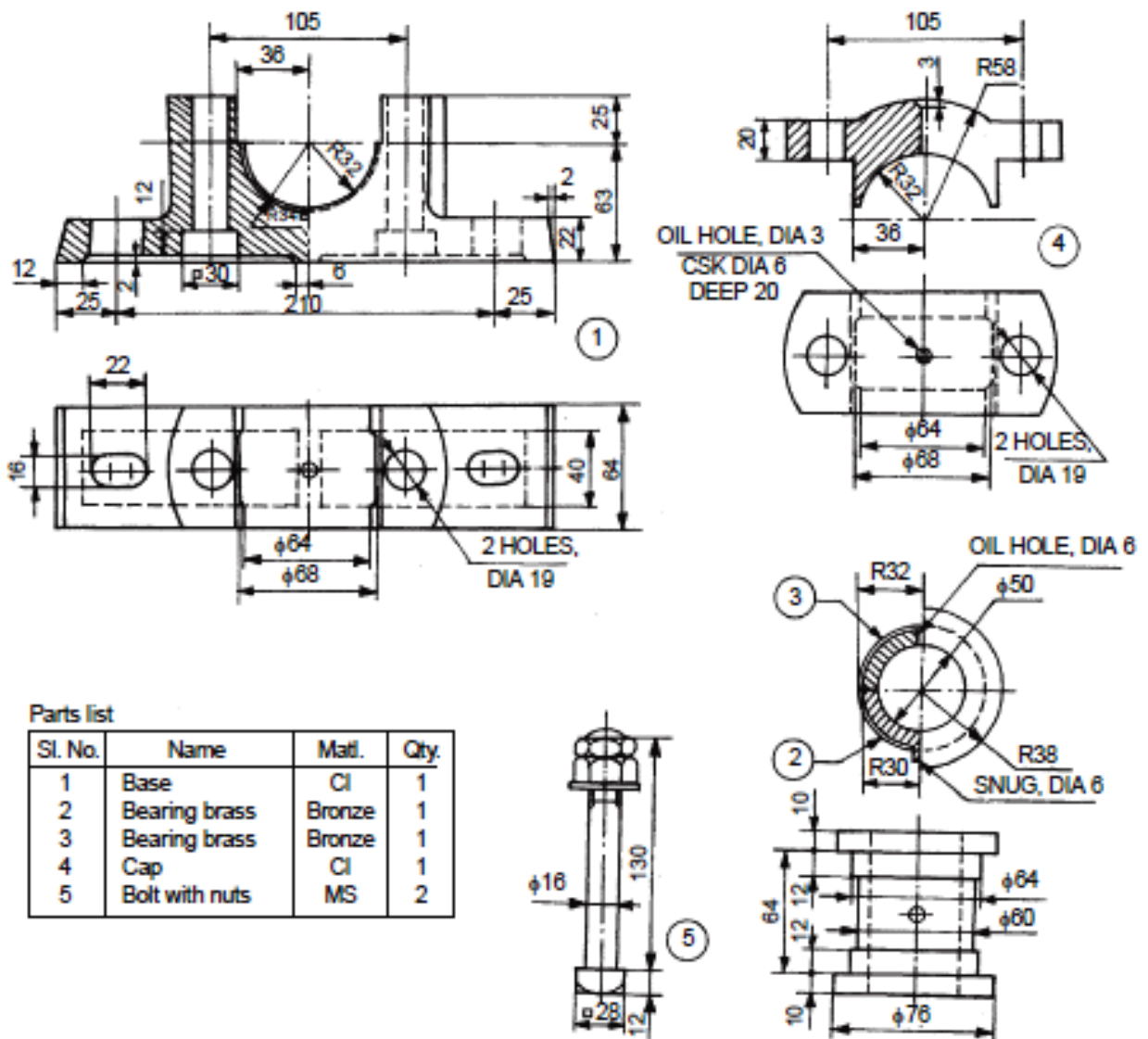


Fig.5



**GOVERNMENT ENGINEERING COLLEGE
MECHANICAL ENGINEERING DEPARTMENT**

Session: IV SEMESTER AY: 2018-19

Course teachers: Prof. R. I. PATEL, Prof. S.A. SHAH
Prof B. N. GELOT, Prof. P.J. PATEL

6. Figure 6. shows the details of a pressure relief valve. Assemble the parts and draw to full size, (i) the view from the front and (ii) sectional view from above. **(For Batch: 4MB3)**

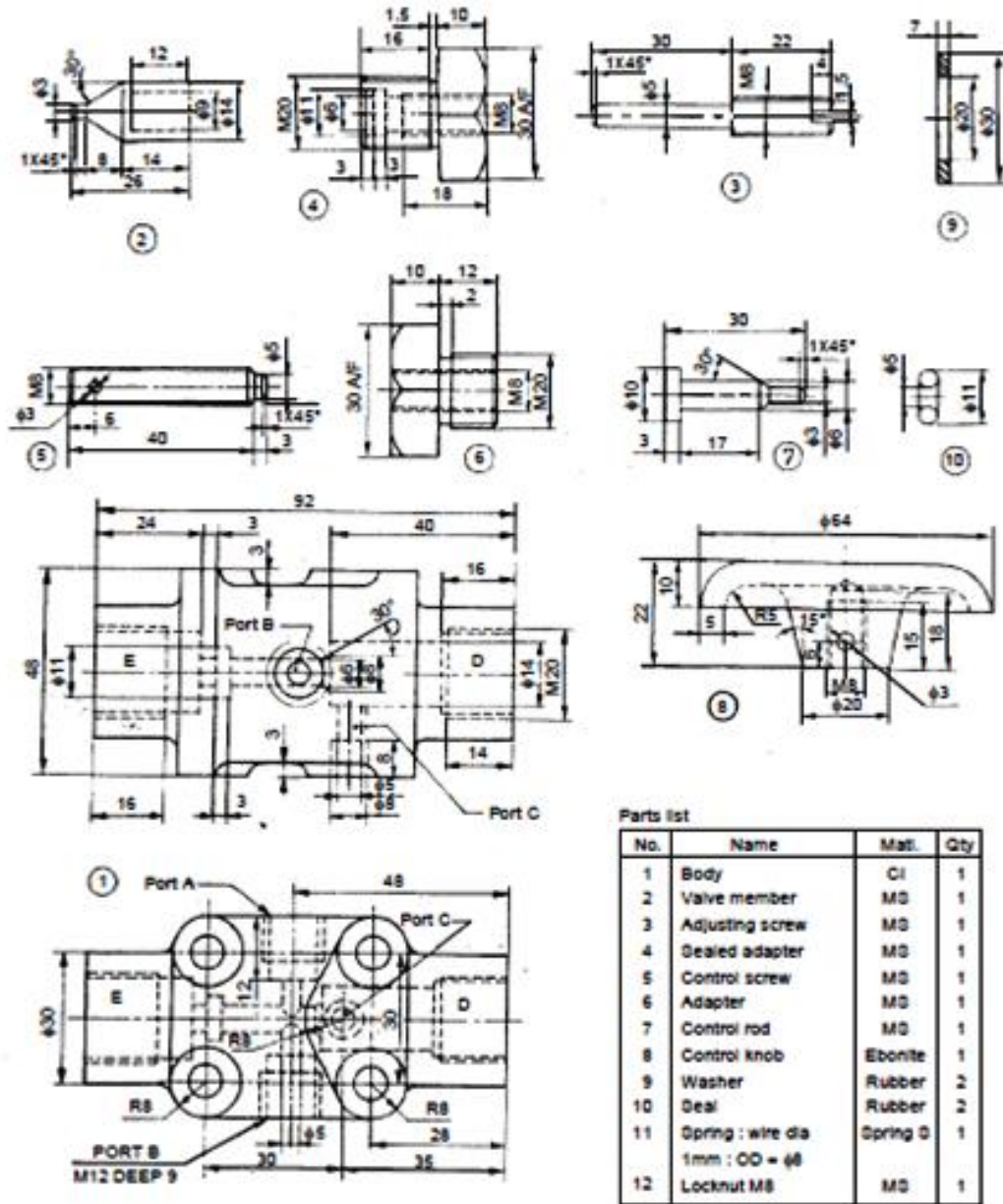


Fig.6



**GOVERNMENT ENGINEERING COLLEGE
MECHANICAL ENGINEERING DEPARTMENT**

Session: IV SEMESTER AY: 2018-19

Course teachers: Prof. R. I. PATEL, Prof. S.A. SHAH
Prof B. N. GELOT, Prof. P.J. PATEL

MACHINE DESIGN & INDUSTRIAL DRAFTING

SUBJECT CODE :- 2141907

PART-II

- | | |
|-----------|---|
| 1. | <p>Design a screw jack for lifting a load of 50 kN through a height of 0.4 m. The screw is made of steel and nut of bronze. Sketch the front sectional view. The following allowable stresses may be assumed
For steel : Compressive stress = 80 MPa ; Shear stress = 45 MPa
For bronze : Tensile stress = 40 MPa ; Bearing stress = 15 MPa
Shear stress = 25 MPa.
The coefficient of friction between the steel and bronze pair is 0.12. The dimensions of the swivel base may be assumed proportionately. The screw should have square threads. Design the screw, nut and handle. The handle is made of steel having bending stress 150 MPa (allowable).
Assemble all parts of the screw jack, and draw the following views:
(i) Half sectional view from the front, and
(ii) View from above.
(Batch:41 & 46)</p> |
| 2 | <p>A screw jack is to lift a load of 80 kN through a height of 300 mm. The elastic strength of screw material in tension and compression is 200 MPa and in shear 120 MPa. The material for nut is phosphor-bronze for which the elastic limit may be taken as 100 MPa in tension, 90 MPa in compression and 80 MPa in shear. The bearing pressure between the nut and the screw is not to exceed 18 N/mm². Design and draw the screw jack. The design should include the design of 1. screw, 2. nut, 3. handle and cup, and 4. body.
Assemble all parts of the screw jack, and draw the following views:
(i) Half sectional view from the front, and
(ii) View from above.
(Batch:42 & 45)</p> |
| 3 | <p>Design and draw a screw jack for lifting a safe load of 150 kN through a maximum lift of 350 mm. The elastic strength of the material of the screw may be taken as 240 MPa in compression and 160 MPa in shear. The nut is to be made of phosphor bronze for which the elastic strengths in tension, compression and shear are respectively 130, 115 and 100 MPa. Bearing pressure between the threads of the screw and the nut may be taken as 18 N/mm². Safe crushing stress for the material of the body is 100 MPa. Coefficient of friction for the screw as well as collar may be taken as 0.15.
Assemble all parts of the screw jack, and draw the following views:
(i) Half sectional view from the front, and
(ii) View from above.
(Batch:43 & 44)</p> |