

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**B.E. (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2014**

**MECH/MANUFACTURING ENGINEERING**

**FIFTH/Sixth Semester**

**ME 9301 DESIGN OF JIGS, FIXTURES AND PRESS TOOLS**

(Regulations 2008)

Duration: 3 Hours

Answer ALL Questions

Max. Marks: 100

- Note: i) Use of Approved Design Data Book permitted.  
ii) Assume missing dimensions suitably.  
iii) Drawings need not be drawn to scale but should follow standards.

**Part – A (10 x 2 = 20 Marks)**

1. What is the difference between a jig and a fixture?
2. What are principal and secondary locators? Give examples.
3. Generally, it is a practice to have four legs for a drill jig instead of three. Give your explanation.
4. What are the functions of tenons and setting blocks?
5. What is meant by 'shut height' of a press?
6. What is meant by a double-pass layout?
7. What is the difference between direct and indirect knock out?
8. What is meant by centre of pressure?
9. Differentiate between cropping and parting.
10. How do you determine the number of draws required for drawing a cup?

**Part – B (4 x 20 = 80 Marks)**

11. Design and draw two views of a progressive die for producing the component shown in figure 11. The sheet metal is of 18 gauge and made of cold rolled steel of ultimate strength  $580 \text{ N/mm}^2$ 
  - i) Determine the press tonnage and the various stations required (2 Marks)
  - ii) Design all the parts of the die. (8 Marks)
  - iii) Draw two fully dimensioned views of the die in engaged position. (8 Marks)
  - iv) Give a parts list. (2 Marks)

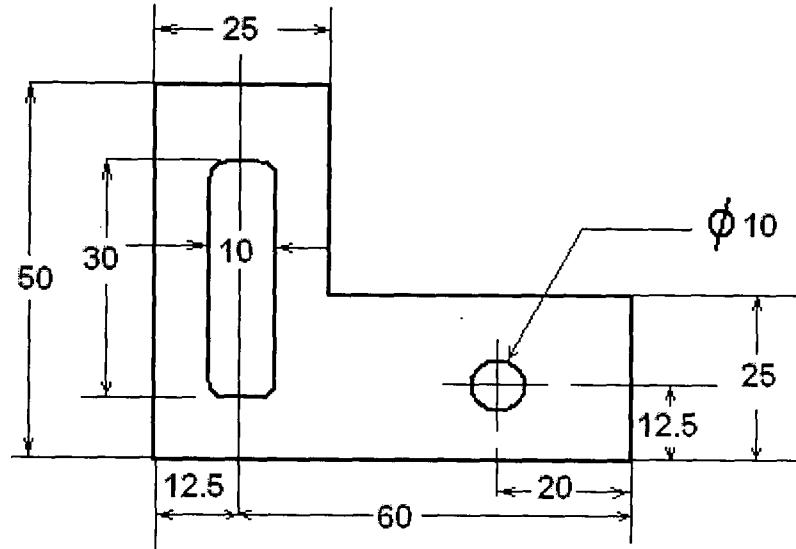


Figure 11

12. a) Design a drill jig for use when drilling the six holes of  $\phi 10$  in the component shown in figure 12 a.
- Give a neat operation chart. (2 Marks)
  - Draw two views of the Jig. (12 Marks)
  - Specify appropriate fits and tolerances for critical parts. (2 Marks)
  - Dimension the views. (2 Marks)
  - Give a neat parts list. (2 Marks)

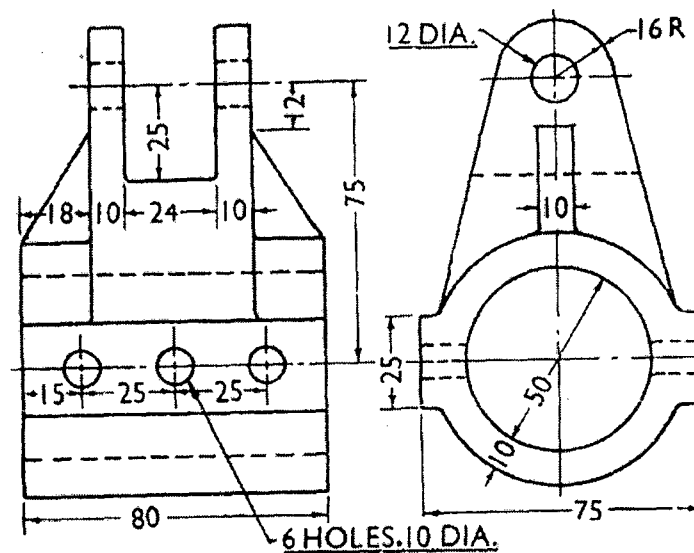


Figure 12 a

(Or)

12. b) Design a suitable jig for use when drilling the six holes of  $\phi 14$  in the component shown in Figure 12 b.
- Give a neat operation chart. (2 Marks)
  - Draw two views of the Jig. (12 Marks)
  - Specify appropriate fits and tolerances for critical parts. (2 Marks)
  - Dimension the views. (2 Marks)
  - Give a neat parts list. (2 Marks)

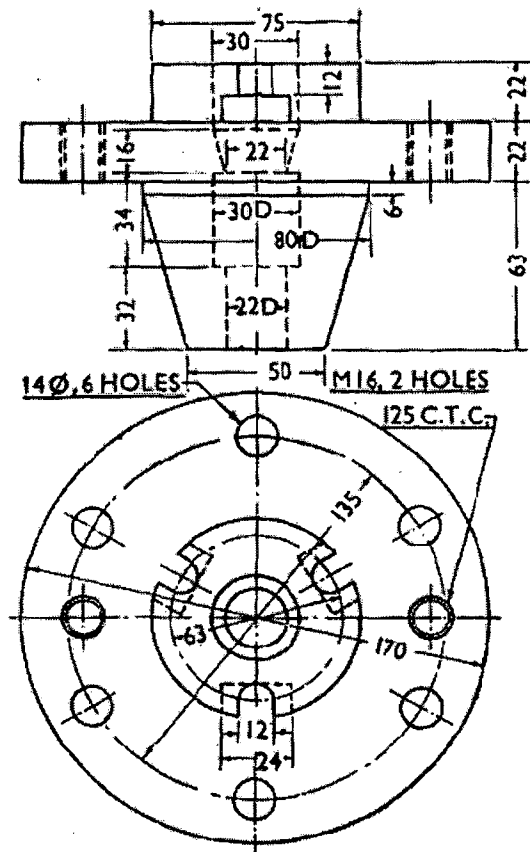


Figure 12 b

13. a) Design a milling fixture for milling the 6 mm slot of the component shown in the top view of figure 13 a.

- i) Give a neat operation chart. (2 Marks)
- ii) Draw two views of the Fixture. (12 Marks)
- iii) Specify appropriate fits and tolerances for critical parts. (2 Marks)
- iv) Dimension the views. (2 Marks)
- v) Give a neat parts list. (2 Marks)

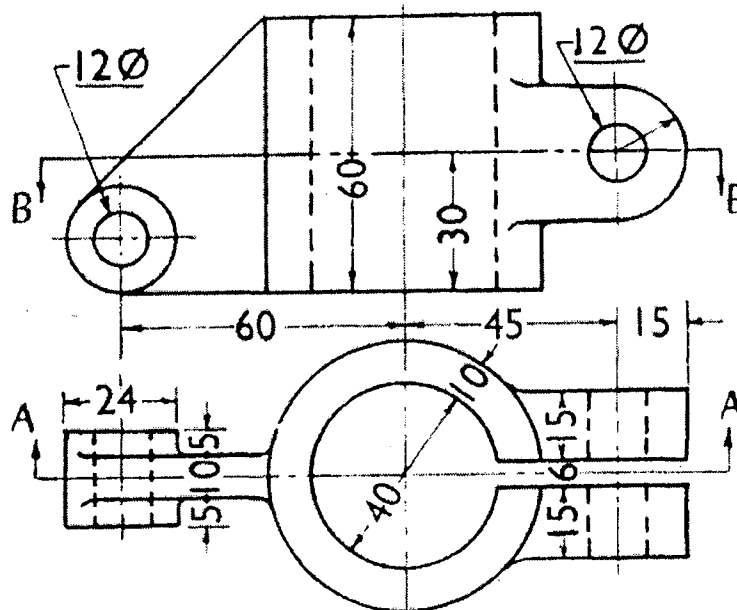


Figure 13 a

(Or)

13. b) Design a turning fixture for use when finish boring the  $\phi 50$  bore in the component shown in figure 12 a.
- i) Give a neat operation chart. (2 Marks)
  - ii) Draw two views of the fixture. (12 Marks)
  - iii) Specify appropriate fits and tolerances for critical parts. (2 Marks)
  - iv) Dimension the views. (2 Marks)
  - v) Give a neat parts list. (2 Marks)

14. a) Design and draw 2 views of a suitable die for the component shown in figure 14 a.
- i) Calculate the size of Blank required (2 Marks)
  - ii) Determine the press tonnage and the various stations required (2 Marks)
  - iii) Design all the parts of the die. (8 Marks)
  - iv) Draw two fully dimensioned views of the die in engaged position and give a neat parts list (8 Marks)

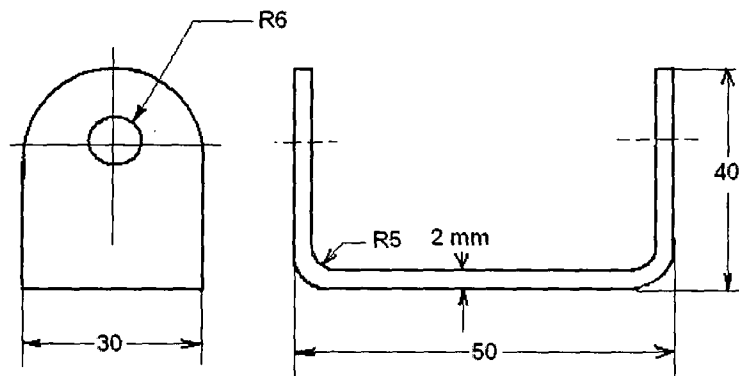


Figure 14 a

(Or)

14. b) Design and draw two views of a combination blanking and drawing die for the component shown in figure 14 b. Assume yield strength  $50 \text{ kN/cm}^2$
- i) Calculate the size of Blank required (2 Marks)
  - ii) Determine the press tonnage and the various stations required (2 Marks)
  - iii) Design all the parts of the die. (8 Marks)
  - iv) Draw two fully dimensioned views of the die in engaged position and give a neat parts list. (8 Marks)

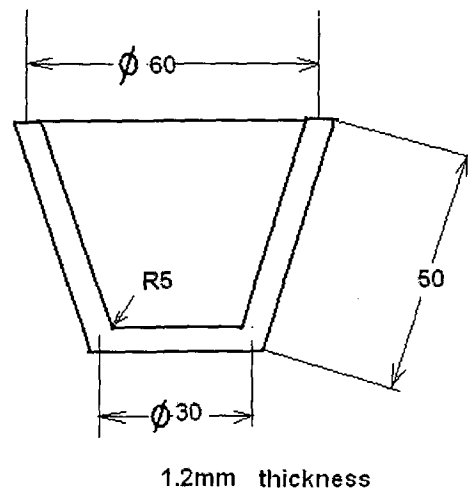


Figure 14 b