

B.E. (FULL TIME) DEGREE END SEMESTER EXAMINATION, NOV/DEC 2011

MECHANICAL ENGINEERING BRANCH

Fifth Semester

**ME9301-DESIGN OF JIGS, FIXTURES AND DRESS TOOLS**

(Regulations 2008)

Time : 3 hrs

Max Mark : 100

- Instructions:
- i) Use of Approved Design Data Books permitted
  - ii) Drawing sheets will be provided
  - iii) Drawings need not be drawn to scale but should follow standards.
  - iv) Assume missing dimensions suitably
  - v) All dimensions are in mm

**Answer ALL questions**

**Part – A (10 x 2 = 20 Mark)**

1. What are the differences between jigs and fixtures?
2. What are the specific advantages of Diamond pin locators?
3. List the different types of bushes and its uses.
4. What is meant by "Foolproofing"?
5. Differentiate between Swaging and bulging.
6. What are the advantages of Compound Dies over Progressive Dies?
7. 'V' blocks are widely used in milling fixtures. State the reasons.
8. What are modular fixtures? Give typical uses for the same.
9. Bring out the differences between blanking and piercing.
10. What is meant by air-bending?

**Part – B (5 x 16 = 80 Mark)**

11. Design and draw two views of a progressive die is to be designed for producing the component shown in Fig.11. The sheet metal is of 16 gauge and made of Cold Rolled Steel of Ultimate Strength 580 N/mm<sup>2</sup>.
  - i) Determine the press tonnage and the various stations required
  - ii) Design all the parts of the die.
  - iii) Draw two fully dimensioned views of the die in engaged position.
- 12.a Design a drilling jig for use when drilling the 6 holes,  $\phi 14$  holes in the component shown in Fig.12.a.
  - i) Draw two views of the Jig.
  - ii) Dimension the views.
  - iii) Give a neat parts list.

or

12.b Design a suitable jig for use when drilling the 4 holes in the component shown in Fig. 12.b.

- i) Draw two views of the Jig.
- ii) Dimension the views.
- iii) Give a neat parts list.

13.a Design a Milling fixture for milling the slot of 4mm width in the component shown in Fig. 13.a.

- i) Draw two views of the fixture.
- ii) Dimension the views.
- iii) Give a neat parts list.

or

13.b Design a Turning Fixture for use when finish boring the  $\phi 50$  bore in the shaft support shown in Fig.12.b.

- i) Draw two views of the fixture.
- ii) Dimension the views.
- iii) Give a neat parts list.

14.a Design and draw 2 views of a compound Blanking and piercing die for the component shown in Fig. 14.a. The sheet metal is of 16 gauge thickness. The sheet is made of Cold Rolled Steel of Ultimate tensile Strength  $580 \text{ N/mm}^2$ .

- i) Determine the press tonnage and the various stations required
- ii) Design all the parts of the die.
- iii) Draw two fully dimensioned views of the die in engaged position.

or

14.b Briefly describe the following.

- (i)Welding fixtures (8)
- (iii)Inspection fixtures. (8)

15.a Design and draw 2 views of a combination Blanking and drawing die for the component shown in Fig. 15.a.

- (i) Calculate the size of Blank required
- (ii) Determine the press tonnage and the various stations required
- (iii) Design all the parts of the die.
- (iii) Draw two fully dimensioned views of the die in engaged position.

or

15.b Write short note on the following:

- (i)Calculation of center of pressure with an example. (4)
- (ii)Press tonnage. (4)
- (iii)Strip layout. (4)
- (iv)strippers (4)

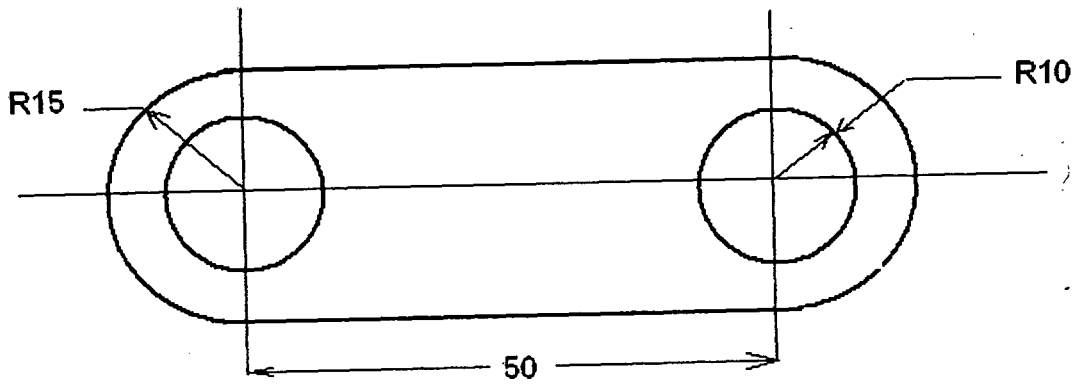


Fig.11

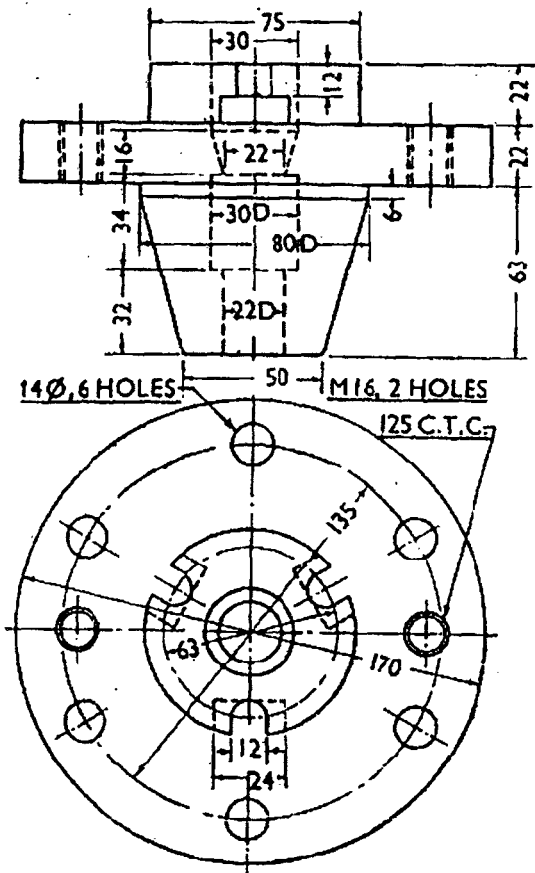


Fig.12.a

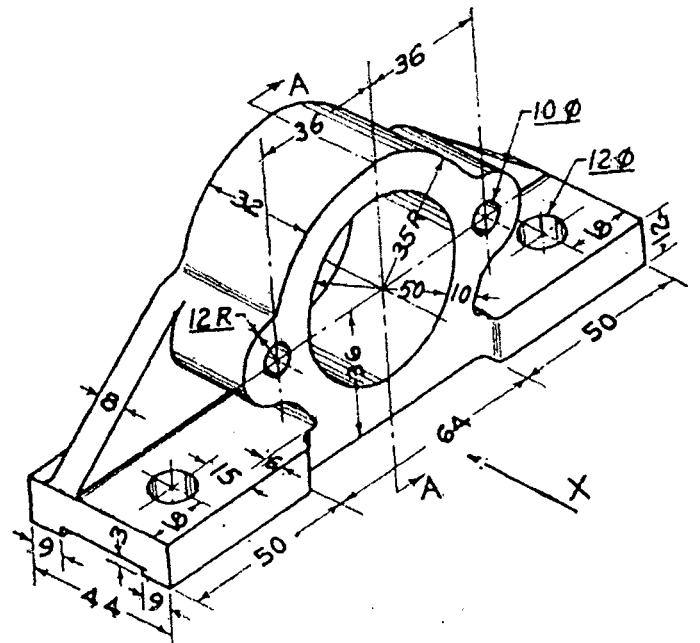


Fig.12.b.

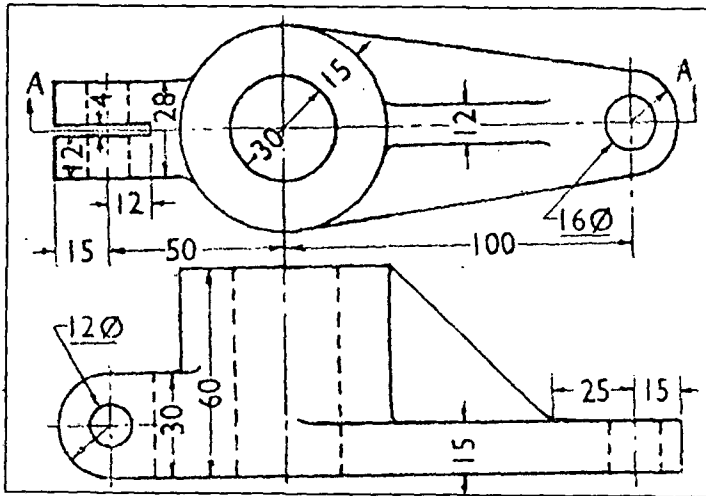


Fig.13.a

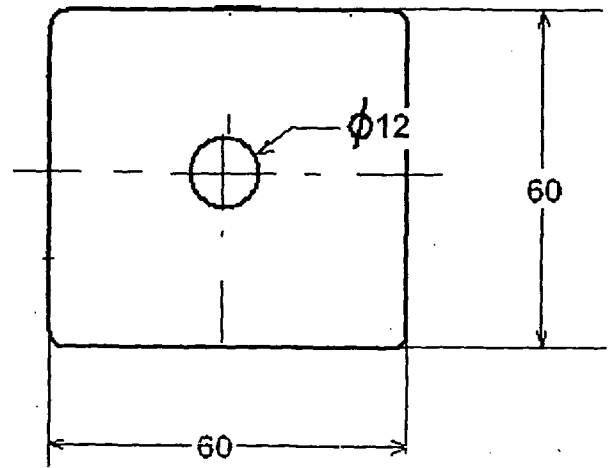


Fig. 14.a

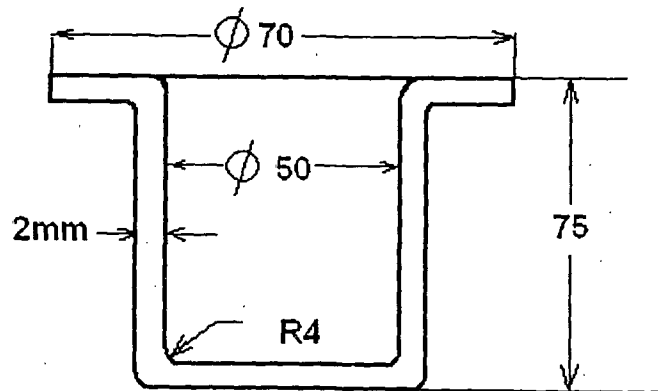


Fig.15.a