



## ME 1009 DESIGN OF JIGS, FIXTURES AND PRESS TOOLS

5. Describe the accessories of jigs and fixtures.
6. Explain briefly 3-2-1 location of principle.
7. Explain briefly with neat sketch cylindrical and adjustable locators.
8. Explain briefly non-conventional clamping.
9. Explain briefly with neat sketch latch and wedge clamping.
10. Explain briefly magnetic clamping.
11. With a neat sketch explain pneumatic and hydraulic clamping.
12. What is meant by vacuum clamping?

### **UNIT-II**

#### **PART-A**

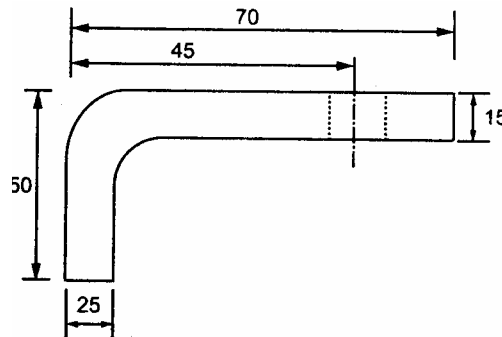
##### **(JIGS)**

1. What is the function of jig bushes?
2. When will press fit bushes or fixed bushes be used?
3. Specify the condition of using plain and flanged bushes in jigs.
4. How liner bushes are used?
5. What are the different types of jigs?
6. Define sandwich jig.
7. State the provision made on latch or leaf Jig.
8. What are the disadvantages of leaf jigs?
9. Sketch the channel jig.
10. What are the advantages of trunnion jig?
11. Define indexing device.
12. What is the use of indexing jig?
13. What are various possibilities to operate automatic drill jigs?

#### **PART-B**

1. Describe the important elements of any jig.
2. Explain any four types of drill bushes with sketch.
3. Discuss the various types of drill bushes.

4. What is a drill jig? What are the requirements of drill jigs?
5. Describe the working of rack and pinion operated drill jig and compare the pneumatic jig.
6. Design a drill jig make a hole of diameter 8mm as shown in figure and also mention the part list.



**UNIT-III**

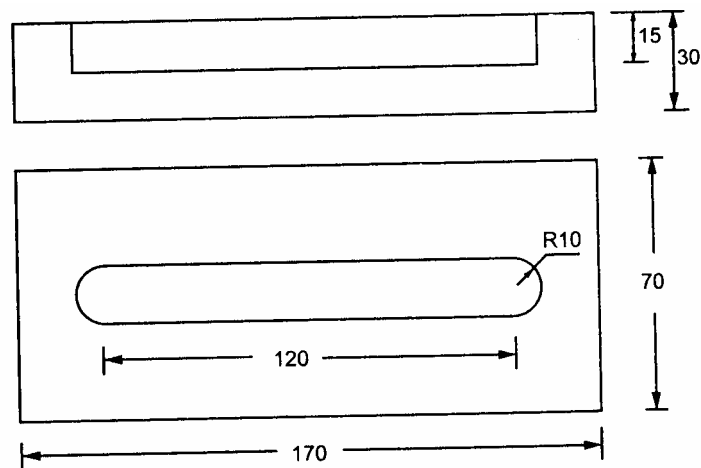
**PART-A**

**(FIXTURES)**

1. What is the use of fixtures?
2. What are the standard work holding devices in lathes?
3. State any four design points should be considered while designing lathe fixtures.
4. What is the function of mandrels in turning fixture?
5. Mention the application of turning fixture.
6. What are the various types of milling fixtures?
7. How is cutter setting done?
8. What are the factors to be considered while string milling fixture selection?
9. What are the factors to be considered while selecting gang milling fixture?
10. What are the various machine tools used for boring?
11. Define key way broaching fixture.
12. What are the ways the work piece can be held for machining on a surface grinder?
13. What are static fixtures?
14. What is meant by pressing fixture?
15. What are the steps involved in operating pressing fixtures?
16. List out the type of locators and clamping device used in welding fixture.

**PART-B**

1. What are the design factors to be considered while designing a lathe fixture?
2. Briefly explain the construction and working of faceplate turning fixture.
3. Explain any one type of lathe mandrel.
4. List out the various types of milling fixtures and explain any two in detail.
5. Define the tennon and setting block in milling fixture.
6. Explain with a neat sketch the working of a gang milling fixture and compare with straddle milling fixture.
7. Differentiate straddle milling fixture and key-way milling fixture.
8. Define broaching and explain the types of broaching fixtures with neat sketch.
9. Design a milling fixture to make a slot of 120 X 120 X 15.
10. What are factors to be considered while designing milling fixture?
11. Design a milling fixture to make a slot of 120 x 20 x 15 as shown in figure.



**UNIT-IV**

**PART-A**

(PRESS WORKING TERMINOLOGIES AND ELEMENTS OF DIES AND STRIP LAY OUT)

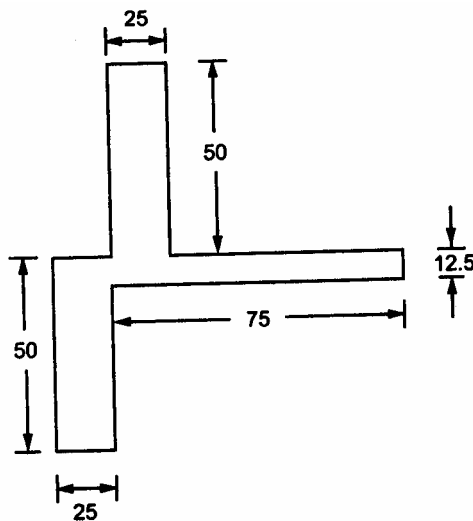
1. What are the applications of press working operations?
2. How is the cutting operation carried out?
3. How is forming operation carried out?
4. List out the various cutting operations.
5. Name some types of forming operations.
6. List out the press working terminology.
7. What is the purpose of pilot?
8. Classify presses according to the mechanism used for applying power to ram.
9. Mention any four important factors to be considered while selecting a press.
10. Write down the formula for calculating tonnage limited by the motor.
11. Define clearance.
12. What is the significance of die and punch clearance?
13. Explain the function of bolster plate in press tool.
14. Write down the formula for calculating the smallest hole that can be punched in a sheet metal?
15. In what way the operations are carried out in progressive die.
16. State any two advantages and disadvantages of progressive dies.
17. Difference between compound die and combination die.
18. Differentiate progressive dies with compound dies.

**PART-B**

1. Describe briefly the various press working operations.
2. Write short notes on terminology.
3. What are the factors to be considered while selecting a press?
4. Explain briefly the functions of following parts in press tool.
  - (i) Stripper
  - (ii). Pilots
  - (iii). Shedder.

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5. Explain fixed stripper and spring – loaded stripper with sketch.
6. Sketch complete die- set assembly.
7. Describe with neat sketches any two dies used in press working operations.
8. Describe with a neat sketch a compound die and compare its merits and demerits with combination die.
9. Explain with example center of pressure.
10. Differentiate between compound die, combination die and progressive die.
11. Write short notes on the following.
  - (i) Bending and forming die
  - (ii). Combination and compound die.
  - (iii). Calculation of center of pressure with example.
12. Find center of pressure as shown in figure.



### UNIT-V

#### PART-A

#### (DESIGN AND DEVELOPMENT OF DIES)

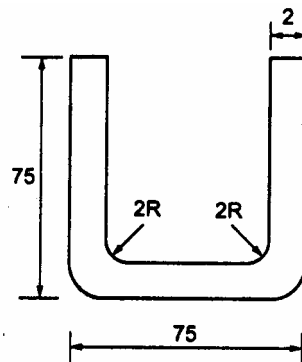
1. Write down the formula for calculating cutting force required in a cutting operation?
2. Write down the formula for calculating drawing force required in drawing operations.
3. How is the press capacity determined for exerting force in drawing?

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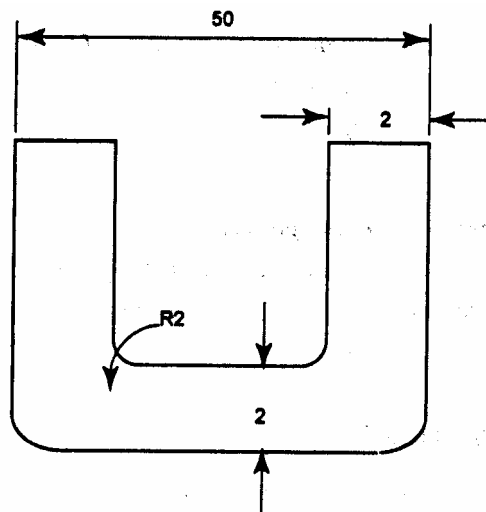
4. Write down the formula for calculating bending force in a press working operations.
5. What is the purpose of stocks-stop?
6. What does meant by bending allowance?
7. What is meant by flash and gutter?

### PART-B

1. Write short notes on bending, forming and drawing.
2. Write down the step by step design procedure of cutting dies
3. Write down the step by step design procedure of drawing dies
4. Design for drawing die as shown in figure from medium carbon steel take  $f_t = 36$  KN/CM<sup>2</sup>

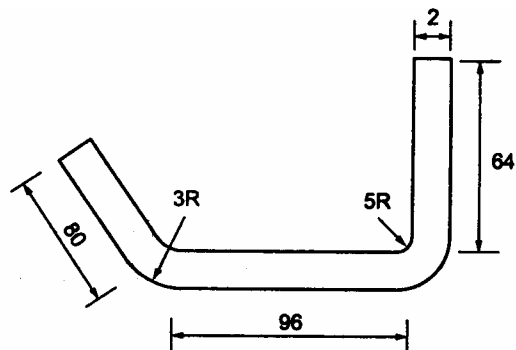


5. Sketch and design a drawing die as shown in figure from medium carbon steel 3600 Kg/CM<sup>2</sup>



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6. Explain with example to estimate the number of draws in drawing process.
7. Write short notes on types of forming dies,
8. Sketch and design a blanking die to make 30mm diameter part from 1.6mm thick mild steel metal. Take  $320 \text{ N/mm}^2$
9. Sketch and design a blanking die to make 25mm diameter part from 2mm thick medium carbon steel metal.
10. Sketch and design a blanking die to make diameter 30mm part from 3mm thick carbon steel sheet metal. Take  $f_s = 32 \text{ Kg/mm}^2$
11. How to calculate bending allowance in bending process? Explain.
12. What is spring back? And how is it controlled in bending die?
13. Write short notes:
  - (i) Design of drawing die
  - (ii). Design of bending die.
  - (iii).Types of cutting operations.
14. Calculate the developed length of part as shown in figure.



15. Explain modern press tool with application.
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