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Register Number: ……..

**B.E DEGREE EXAMINATIONS: NOV 2015**

(Regulation 2009)

Seventh Semester

**MECHANICAL ENGINEERING**

MEC133: Design Of Jigs, Fixtures And Press Tools

**Time: Three Hours** **Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. _____ may be defined as a work holding device which locates and holds the component for a specific operation.
   a) Fixture b) Clamp
   c) Jig d) Locator
2. The location system should positively prevent the wrong loading of work piece in a fixture by
   a) Jack pin locator b) Dowel pin
   c) Fool proofing d) Strap clamp
3. _____ carries the drill bush for guiding the tools.
   a) Jig bush b) Jig feet
   c) Jig plate d) Jig body
4. When holes are to be drilled in more than one faces of the work piece, _____ are used.
   a) Channel jig b) Leaf jig
   c) Pot jig d) Box jig
5. _____ is used to hold the hollow work piece.
   a) Mandrels b) Setting block
   c) Tenon strips d) Static fixture
6. A mechanical dial gauge acts as a _____ fixture
   a) Welding b) Inspection
   c) Lathe d) Angle frame
7. A _____ is a metal forming machine tool used to shape or cut metal by applying force.
   a) Punch b) Drill bit
   c) Press d) Die

8. Tonnage requirement is more in _____ dies.

a) Simple b) Progressive

c) Compound d) Combination

9. _____ is the ability of the material to undergo a change in shape without fracture.

a) Ductility b) Bending

c) Forming d) Drawing

10. The axis which separates the portions of tension and compression is known as

a) Centre axis b) Upper axis

c) Neutral axis d) Lower axis

**PART B (10 x 2 = 20 Marks)**

11. Mention the advantages of Jigs and Fixtures.
12. What are the uses of Clamping Devices?
13. State the different types of jigs.
14. Sketch Angular Post Jig.
15. What are the locators used in Fixtures?
16. What is inspection? Mention the uses of inspection fixtures.
17. Write down the advantages of press working operations?
18. Explain the use of a knockout in Press?
19. Differentiate between Cutting and Forming Die.
20. What is meant by coining?

**PART C (5 x 14 = 70 Marks)**

21. a) Explain Pneumatic and Hydraulic Actuation of Clamps.

**(OR)**

b) (i) Differentiate Between Jigs and Fixtures. (4)

(ii) State the Principles for Designing for Jigs and Fixtures. (10)

22. a) (i) What is an automatic drill jig? Mention its types (4)

(ii) Explain Rack and Pinion operated Drill Jig (10)

**(OR)**

b) Design the drill Jig for a Mild steel Component as shown in the figure 1

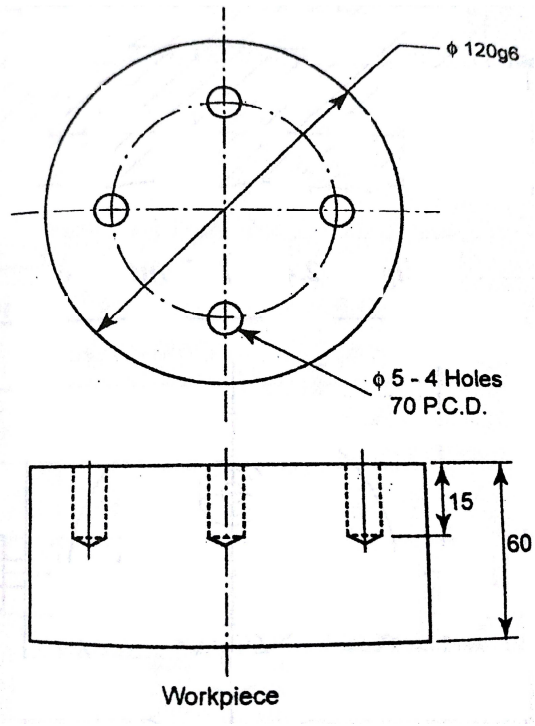


FIG 1

23. a) In detail explain the functions of Welding Fixture. Discuss any two types in detail.

**(OR)**

b) Design a milling Fixture to make a slot of Φ17 x 10 x 10 mm, for the given component.

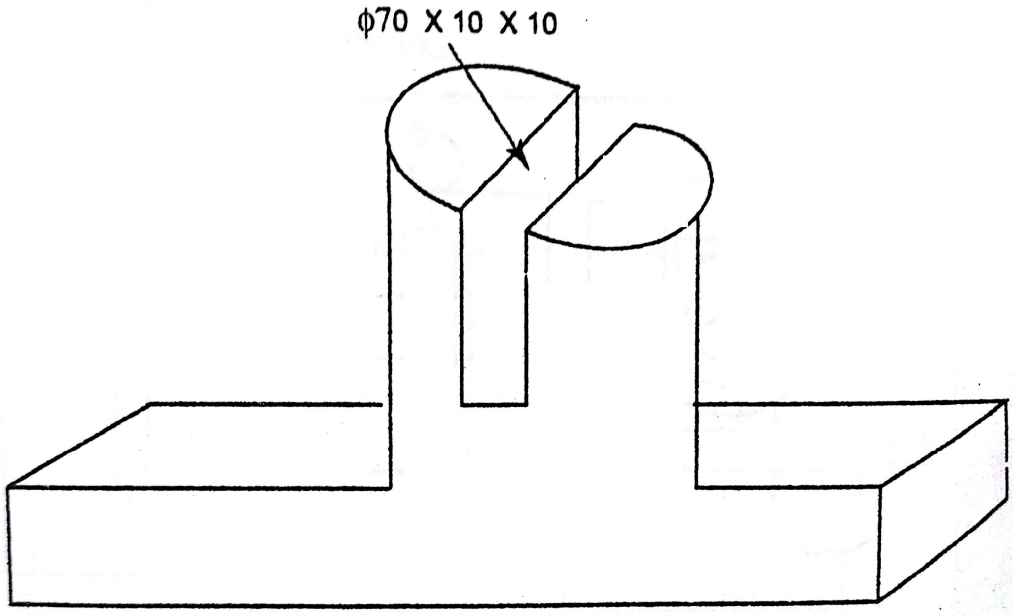


FIG 2

24. a) (i) Explain the principle of Progressive dies and its advantages and disadvantages. (10)

(ii) State the difference between Progressive and Compound Die. (4)

**(OR)**

b) Equal number of circular blanks of a Φ60mm and Φ100mm is required for a product line sketch the single row and nested layouts for the circular blanks and calculate the percent utilization of material. What is the better layout? What is the Increased saving material? Assume that the raw material can procure a coil form. Margin and bridge can be taken as 2mm

25. a) Sketch and design a progressive cutting die to make a steel washer 40mm outside diameter with 20mm hole from 3 mm thick steel sheet. The Ultimate shear strength of the material is 320N/$m^2$.

**(OR)**

b) A shell as shown in figure 3 has a height of 50mm and a diameter of 50mm. The corner radius is 2mm and work piece material is medium carbon steel and it is 2mm thick. Design a die for the yield stress of 20kg/$mm^2$ and shear stress of 18kg/$mm^2$.

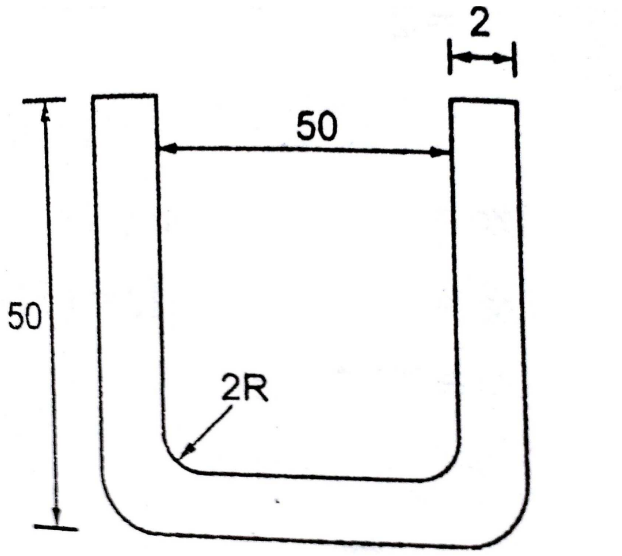


Fig 3

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