Sem VI / Design of press & metal joining Prod
Tool

18-05-15.

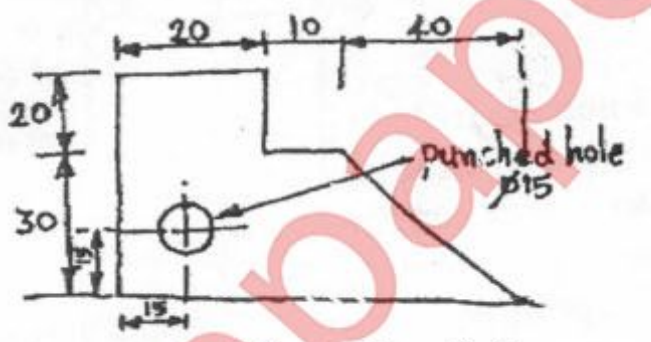
QP Code : 5029

(3 Hours) [Total Marks : 80

N.B.: (1) Question **No.1** is **compulsory**.
(2) Attempt **any three** questions out of the remaining five questions.
(3) Assume any suitable data whereever necessary & justify it.
(4) Figures to right indicate full marks to that question.
(5) Do not use any type of design data book.

K. G. C. E. EXAM KARJAT RAIGAD

1. (a) For a component shown in Figure 1.
   (i) Calculate economic strip layout considering the sheel size 1350mm × 250 mm. 4
   (Material : Brass, shear strength : 50 kg/mm^2, Thickness: 2.5mm)
   (ii) Calculate tonnage of press required for component manufacturing. 3
   (iii) Design for stripper plate. Die block & punches. Determine shut height of press you designed. 3
   (iv) Draw sectional from view and top view of bottom assemble of the die set. 5



(Figure No. 1(a))

(b) Explain different types of oxy acetylene welding flames, also explain its chemistry. 5

2. Explain the following in point form (any five) :- 20
   (a) Hydralic presses are preferred for deep drawing operations. State true or false and give at least two or three reasons. Also state why punch radius and die radius is essential in drawing operation.
   (b) Explain shearing action in press working. Is Double shear is preferred to single shear to reduce maximum cutting force requirement ?
   (c) State three differance between progressive die and compound die. Why the ideal stations are provided in progressive die operations ?
   (d) Explain selection of die sets. Explain one functions of each: shanks, pilots, stopper, strippers and bolsters of die sets.
   (e) What is die clearance in punching and blanking operations ? What determines the correct amount of die clearance ?
   (f) Explain different type of welded joint & joint preparations.
   (g) What is the purpose of weldability testing ? Explain classification of weldability testing.

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3. (a) Differentiate fixed stripper and movable stripper.
   (b) Write four major characteristics of good striplayout for progressive die.
   (c) Devices for the safety of equipment and tooling as well as for safety of operators.
   (d) Find centre of pressure for piercing die shown in figure 3 (d) if blank thickness is 1.5 mm and f_s = 50 kg/mm^2

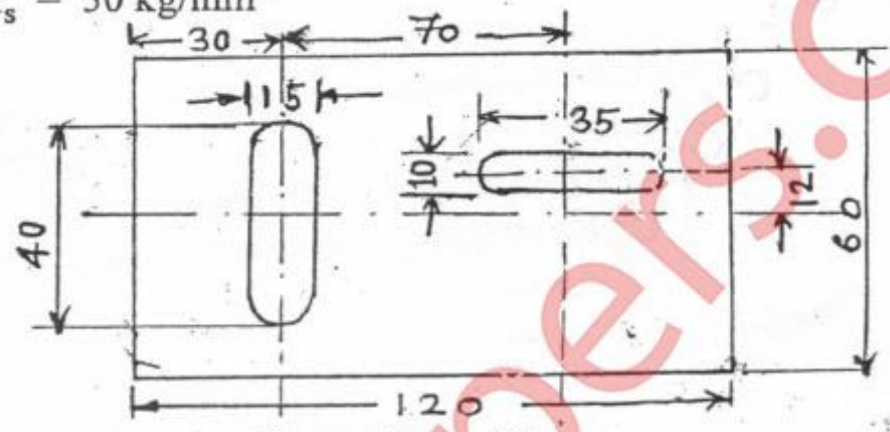

Figure No. 3 (d)

4. (a) A 25.5 mm square hole is to be cut in sheet metal 0.45 mm thick. The shear strength of the material is 32 kg / mm^2. Calculate the cutting force.
   (b) Explain energy supplied by flywheel in presses. Explain the condition of energy overloading of press.
   (c) What is spring back effect in bending ? What are its causes ? Which way we can reduce or prevent the spring back ?
   (d) State need of draw clearance in drawing dies. What are the defects encountered in drawing operation ?

5. (a) Explain the following in point form.(Any three)
   (i) Defects in welding and safety in welding.
   (ii) Thermal stresses induced in welded joints ? How you will reduce them.
   (iii) Air cooled or water cooled torch is to be used with TIG welding.
   (iv) Distortion of residual stresses during welding.

   (b) Find out the developed part length and bending force to create "V" bend at 90^0 for the component shown in figure. Width 15 mm, UTS = 34 kg / mm^2

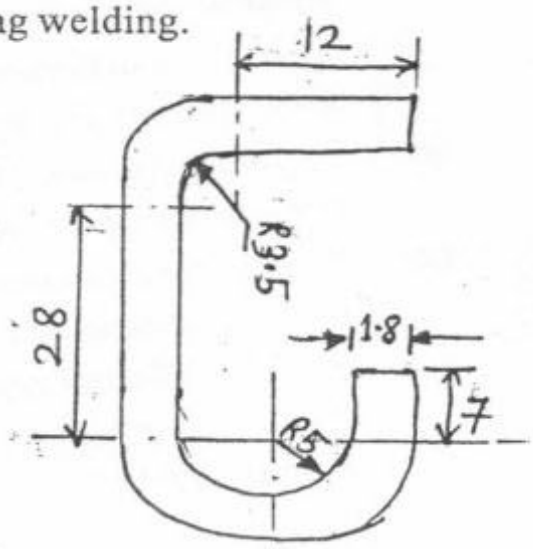

Figure No. 5 (b)

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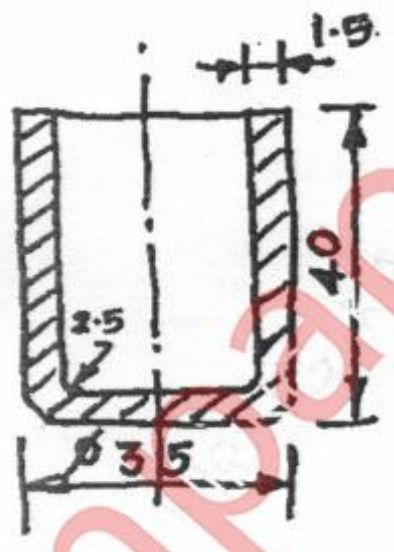
6. (a) OBI presses is more versatile than any other press, state true or false and justify. 4
   (b) Explain Trimming dies and Shaving dies in short. 4
   (c) A cup shown in flgure Q.6(c) is to be manufactured by deep drawing operation. Determine:-
   (i) Developed blank size 4
   (ii) No. of draws require to get final part 2
   (iii) Drawing and blank holding forces in all the draws. 4
   (iv) Reduction ratio in each draw. (Yield strength 45 kg / mm^2) 2



(Figure No. 6(c))

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