

Time: 3 Hour

Max. Marks: 80

N. B. 1) Question no. 1 is compulsory.

(2) Attempt any three questions out of remaining five questions.

(3) Illustrate your answer with necessary sketch wherever necessary.

- Q1. Attempt any four of the following 20
- Sketch a 'push-through' and an 'inverted' draw die and label all parts.
  - Explain with the help of neat sketch design aspects of Press tool elements.
  - Explain different methods of mounting punches.
  - How is the size of a blank calculated for drawing a cup?
  - Five holes of diameter 10 mm each is to be punched in a sheet 3 mm thick at a pitch of 25 mm. What should be the minimum capacity of the press (in tons) if the yield point of the material is 50 MPa and one hole is punched per stroke?
- Q2. (a) Determine the diameter of the hole that can be punched in a steel sheet of thickness 1.6 mm, for which the ultimate shear stress is  $310 \text{ N/mm}^2$ , if Press Capacity is 250 KN. 10
- What will be the punch size if punching is the needed operation?
  - If the blank is to be drawn into a cup, determine the diameter of the cup after the first draw.
- (b) Explain the basic construction & working of combination dies. 10
- Q3. (a) A washer with 12.7 mm internal diameter and outside diameter of 25.4 mm needs to be made from 1.5 mm thick strip of 0.2 percent carbon steel. The ultimate strength of material is  $280 \text{ N/mm}^2$ . a) Find the total cutting force if both punches act at the same time and no shear is applied to either punch or the die. b) What will be the cutting force if the punches are staggered, so that only one punch acts at a time? c) Taking 60 % penetration and shear on punch as 1 mm, what will be the cutting force if both punches act together. 10
- (b) Explain a) Types of bending b) Classify press working operations. 10
- Q4. (a) Explain the defects in drawn parts with suitable sketches. 10
- (b) Determine the capacity of the double bending die for the following data. 10
- sheet metal thickness = 1 mm  
 sheet metal width at bend = 50 mm  
 die radius = 3 mm  
 punch radius = 1.5 mm  
 die clearance = 1.25 mm  
 tensile strength = 315 MPa  
 setting pressure = 560 MPa  
 beads on punch = 2  
 projected width of each bead = 3 mm
- Q5. (a) A steel cup of height 30mm and internal diameter 40 mm with a flange width of 10 mm is to be deep drawn from a sheet 1mm thick. Determine the diameter of blank and the drawing force. What is the draw ratio? Can the cup be drawn in a single operation? 10
- (b) Explain overloading of presses criteria while selecting the press. 10
- Q6. Attempt any four of the following: 20
- Explain with sketch any four types of sensors used for hand protection.
  - Explain different defects in drawn parts.
  - Draw and label parts of shaving die and explain its working
  - Sketch the various methods of applying shear to the punch and die.
  - Describe Spring back effect and measures to control it.

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exam dbit <exam@dbit.in>

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## Correction in Q.P.Code: 10054466

1 message

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**support@muapps.in** <support@muapps.in>

Wed, May 29, 2024 at 3:18 PM

Reply-To: support@muapps.in

To: exam@dbit.in



University of Mumbai

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Press Tool Design  
Correction in Q.P.Code: **10054466**  
Please read as  
Q6 b) Explain any two defects in bend parts due to bending operation.

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<https://qpm.muapps.in>  
[support@muapps.in](mailto:support@muapps.in)

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