

Time: 3 hour

Max Marks:80

- Note: 1. Q1 is compulsory
2. Solve any three from remaining

- Q1 Solve any Four out of Six** **20**
- A. Classify forging processes. Compare hydraulic and Mechanical presses used in forging.
 - B. Classify metal spinning, write applications, and explain any one type of it.
 - C. Differentiate Hot and Cold working.
 - D. Explain various defects in deep drawing with their causes and remedy
 - E. Explain explosive forming process with advantages, limitations, and applications
 - F. Classify extrusion. Write advantages and limitations of hydrostatic extrusion.
- Q2** **20**
- A. A block made of a perfectly plastic material with yield stress of 180 MPa in plain strain has dimensions 250 x 150 x 200 mm (b x hx w). Calculate the peak pressure P at the centre of the die. Also calculate minimum pressure at the edges. Assume sticking friction condition and Tresca's yield criterion.
 - B. Explain the effect of temperature and strain rate on metal forming.
- Q3** **20**
- A. The thickness of plate is reduced from 35 mm to 15 mm by successive cold rolling passes using identical rolls of diameter 700 mm. Assume that there is no change in width and coefficient of friction between the rolls and the workpiece is 0.1. Calculate the minimum number of passes required.
 - B. What is maximum draft in rolling? Derive equation for maximum draft.
- Q4** **20**
- A. In a wire drawing operation, the initial wire diameter is 7 mm and final wire diameter is 6.3 mm. the half die angle $\alpha=10^\circ$. Find the drawing stress considering $\mu=0.1$ and $k=20 \text{ N/mm}^2$. Also calculate the maximum reduction possible.
 - B. Explain deep drawing process with advantages and applications.
- Q5** **20**
- A. Explain stretch forming with advantages, limitations, and applications.
 - B. Write types, causes, and remedies for deep drawing defects.
- Q6** **20**
- A. Explain V and edge bending process.
 - B. Explain various rolling defects with causes and remedies.
