

Total No of Questions: [10]

SEAT NO. :

TE [Production:2012 and 2015 course]: End semester examination[May2018]

Material Forming

(Semester - V)

Time: 2 Hours 30 minutes

Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, , Q7 or Q8, , Q9 or Q10
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Assume Suitable data if necessary

- Q1) a) Derive an equation for plastic work done. [4]
b) Explain Tresca and Vonmises criteria of yielding. [6]

OR

- Q2) a) Explain and differentiate between Hot forging and Cold forging. [5]
b) Explain upsetting with neat sketch. [5]

- Q3) Tube of 14 mm internal diameter and 0.75mm thickness is reduced to 12 mm internal diameter and 0.5 mm thickness. The die angle is 18^0 and plug angle is 10^0 . The coefficient of friction at die and tube interface and tube and plug (fixed and floating) as well as at mandrel interface is 0.1. The flow stress of tube material is 250 N/mm^2 . Calculate and Compare drawing stress, drawing load, motor power required (Assuming drawing speed 0.5 m/s) if the process is carried out using i) Fixed plug ii) Floating plug and iii) Moving cylindrical mandrel. [10]

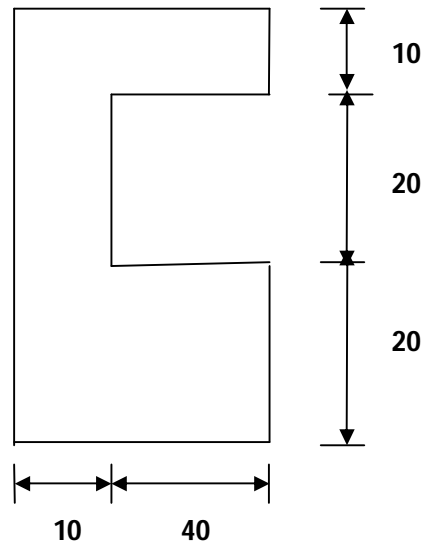
OR

- Q4) a) Describe Board drop hammers with neat sketch [6]
b) Explain grain flow aspect to forge a gear blank [4]
- Q5) a) Explain Three high rolling mills and Four high rolling mills with neat sketch. State the advantages and limitations [8]
c) Explain the breakdown pass in rolling with its principal series [sequence] [8]

OR

- Q6) a) Explain Automatic Gauge Control [AGC]. [8]
b) Explain mill spring, mill modulus, ragging, overshooting and hunting in rolling [8]
- Q7) a) Derive and equation for work done in extrusion. [8]
b) An aluminum billet of 70 mm diameter and 1.5 m long is extruded as shown in Figure 1. The flow stress of aluminum is 70 N/mm^2 and Coefficient of friction is 0.25. Calculate [8]
i) Extrusion ratio, ii) Circumscribing circle diameter, iii) Shape factor and
iv) Work done in extrusion

Figure 1



OR

- Q8)**
- a) Explain and differentiate between Forward and Backward hot extrusion with neat sketch [8]
 - b) Explain types of Impact extrusion with neat sketch [8]

- Q9)**
- a) Describe Metal spinning with neat sketch [6]
 - b) Describe Standoff type system of explosive forming neat sketch [6]
 - c) Describe Petro - forge forming with neat sketch. [6]

OR

- Q10)**
- a) Explain different die materials used in Explosive forming [6]
 - b) Describe Tube spinning with neat sketch [6]
 - c) Explain different types of coils used in Electro-Magnetic forming with neat sketch [6]