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## Paper ID [PE503]

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**M. Tech.**

**METAL FORMING (PRE/PE - 503)**

**Time : 03 Hours**

**Maximum Marks : 100**

### **Instruction to Candidates:**

- 1) Attempt any **Five** questions.
- 2) **All** questions carry equal marks.

- Q1)** (a) Discuss the Von Mises and maximum shear stress criterion which are used to predict the onset of yielding in ductile metals.
- (b) Explain why different stress-strain curve is used for hot and cold working.
- Q2)** (a) Derive the expression of roll pressure for flat strip rolling in the leading and lagging zone.
- (b) What are the various process variables which control the rolling process?
- (c) Derive the expression for rolling torque acting on the rolls, assuming all the possible parameters.
- Q3)** (a) Define drawability. Discuss the various factors that effect drawability.
- (b) Discuss the different variables that affect the deep drawing process.
- Q4)** (a) Discuss graphically the effect of lubrication on deformation in extrusion process.
- (b) Derive an expression of work done in deforming a metal in extruding a bar of length,  $L$  and section,  $A$ . Assume any required parameter.
- Q5)** (a) Compare in light of concept, advantages and disadvantages the various methods of tube drawing.
- (b) Discuss the various parameters that affect the process of tube drawing.

- Q6)** (a) Discuss the true stress-strain curve for ductile and brittle material.
- (b) Is the value of Poisson's ratio different for hot and cold working. Justify your answer.
- Q7)** (a) What is the function of support roll in rolling mill. Also discuss the effect of support roll on the torque.
- (b) Derive an expression for punch load for a circular and rectangular punch, assuming all the required data.
- Q8)** Write short notes on:
- (a) Defects in wire drawing.
- (b) Wrinkling.
- (c) Solid lubricants.
- (d) Heat generation in metal forming process.