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M.Tech. (Mechanical Engineering) (Manufacturing Engineering & Automation) (Sem.–1) METAL FORMING Subject Code : MTME-105 M.Code : 91566 Date of Examination : 23-01-23

Time: 3 Hrs.

Max. Marks: 100

INSTRUCTIONS TO CANDIDATES :

- 1. Attempt any FIVE questions out of EIGHT questions.
- 2. Each question carry TWENTY marks.
- 1. a) What is true stress and true strain? Explain true stress strain curves.
 - b) Explain in detail about Tresca maximum shear strain energy criterion and its significance in metal forming applications.
- 2. Draw a sketch of the rolling operation for a strip and analyze the force and stresses during rolling.
- 3. a) Explain some defects that can be present in rolled products with their remedies.
 - b) Differentiate hot working and cold working of metal and its effects on metal.
- 4. a) Describe the role of friction in metal flow and surface formation in metal forming.
 - b) Calculate the power require to draw hot drawn steel wire from 11.4 mm to 9.4 mm (in diameter) at 94 m/min. The coefficient of friction between the die and the wire can be assumed as 0.14 and the die angle is 5°. The average flow stress for hot drawn steel can be assumed as 30kgf/mm². Also calculate the maximum reduction that can be possible in this process.
- 5. a) Explain the process of tube drawing and discuss the various parameters that affect the process of tube drawing.
 - b) Discuss the ironing and wrinkling effects in metal forming processes.

- 6. State and explain the importance, principle and mechanism of the lubrication in metal forming processes. Explain hydrodynamic film lubrication with the help of a simple block diagram.
- 7 a) Explain the process of wire drawing. What are the parameters affecting the process?
 - b) Differentiate forward extrusion and backward extrusion with neat sketch.

8. Write a short note on the following:

- a) Causes and remedial measures of defects in forging.
- b) General classification of rolling mills.

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.