M.Tech. 1st Semester (Mechanical Engg.)

Examination, December–2018

METAL FORMING ANALYSIS

Paper– M–807-A

Time allowed : 3 hours] *[Maximum marks : 100*

***Note:** Attempt any five questions.*

1. (a) Discuss the stress strain relation in elastic and plastic materials. 10

   (b) Explain in detail the yield criteria for ductile materials. 10

2. Explain the following:

   (a) Slip line field theory.

   (b) Upper and lower boundary methods. 10

3. What are the various technology and analysis considerations of rolling, stretch forming, bending, and wire drawing metal forming process? Explain in detail.20

4. Explain the use of international standards in metal forming problem solutions and system design in detail. 20

5. Discuss various forming defects in products and their critical effects along with their remedies. 20

6. Write short notes on:

   (a) Shape functions.

   (b) Elasto-plastic approximation. 20

7. For the given state of stress, determine the principal stresses and their directions. Also check for the invariance. 20

$$\begin{bmatrix} 1 & 2 & 1 \\ 2 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$$

8. Explain the following: 20

(a) Steady state solutions for drawing.

(b) Stiffness matrices and their assembly.