

**22613**

**M. Tech. 1<sup>st</sup> Sem. (MAE) CBCS Scheme  
Examination – February, 2022**

**METAL FORMING ANALYSIS**

**Paper : MTMA21C1**

*Time : Three hours ]*

*[ Maximum Marks : 100*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :** Attempt any *five* questions. Question No. 1 is *compulsory* and attempt at least *one* question from each Unit. All questions carry equal marks.

1. Explain in brief the following : 4 × 5 – 20
- (a) Stress strain diagram for ductile material theoretical and practical.
  - (b) State difference between hot working and cold working process.
  - (c) Extreme pressure lubricants
  - (d) Importance of Finite Element Method in metal forming analysis.

**UNIT – I**

- 2. State and explain about Tresca maximum shear-strain energy criterion. 20
- 3. Discuss the importance Slip line field theory in metal forming process. 20

**UNIT – II**

- 4. What do you mean by Rolling and discuss its various types. 20
- 5. Discuss the Effects of temperature and strain rate in metal working processes. 20

**UNIT – III**

- 6. Explain the principles and mechanism of lubrications in metal forming processes. 20
- 7. What is the need lubricants used for rolling and cold drawing ? 20

**UNIT – IV**

- 8. Discuss the Implicit and Explicit formulations. 20
- 9. Explain the Elasto-plastic approximations method. 20