

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII EXAMINATION – WINTER 2025

Subject Code:3171921

Date:18-11-2025

Subject Name: Metal forming analysis

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

- Q.1** (a) Draw and explain stress-strain curve for ductile material. **03**
(b) Briefly explain Forming limit curve with a neat sketch. **04**
(c) Explain in detail Terminology of rolling with neat sketch. **07**
- Q.2** (a) Explain blanking and piercing with neat sketch. **03**
(b) Discuss defects in deep drawing process. **04**
(c) Prove Hencky's first theorem for Slip Lines with usual notations. **07**
- OR**
- (c) Briefly explain the 2-Dimensional Graphical representation of Von Mises' and Tresca's yield criteria for plastic deformation **07**
- Q.3** (a) How do you represent strain hardening effect? **03**
(b) Differentiate open die forging and closed die forging. **04**
(c) Explain Isotropic and Kinematic work hardening with neat sketches **07**
- OR**
- Q.3** (a) Explain Wire Drawing processes in brief **03**
(b) Discuss direct and indirect extrusion with neat sketch. **04**
(c) Explain about importance of Upper bound and Lower bound theorem in metal forming. **07**
- Q.4** (a) Define (i) dry drawing (ii) wet drawing (iii) tube drawing **03**
(b) Discuss forging defects with neat sketch. **04**
(c) Explain the analysis of Strip Drawing process with usual notations. **07**
- OR**
- Q.4** (a) Define the following terms: (i) Hot forming, (ii) Cold Forming **03**
(b) List various flat rolling processes and discuss any two. **04**
(c) Analysis of compression of circular disc with slab method **07**
- Q.5** (a) What are the common types of extrusion defects. **03**
(b) Why friction measurement is necessary in forming process? **04**
(c) Explain various operations performed on sheet-metal press machine. **07**
- OR**
- Q.5** (a) Define angle of bite and discuss its effect in rolling process. **03**
(b) Discuss Anisotropy and its effects in deep drawing. **04**
(c) With neat sketch explain the steps of close die forging process. **07**
