

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2023****Subject Code:3162512****Date:11-12-2023****Subject Name:Advance Metal Forming****Time:02:30 PM TO 05:00 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) What is the difference between hot working and cold working? **03**
(b) Draw and explain the stress-strain diagram for ductile materials. **04**
(c) Give detailed classification of forging. **07**
- Q.2** (a) Write definitions of i) principal stress, ii) stress iii) strain. **03**
(b) Explain stress at a point and stresses on an inclined plane. **04**
(c) List and explain material properties of metals and alloys. **07**
- OR**
- (c) Explain electromagnetic forming. **07**
- Q.3** (a) Enlist different types of rolling mills. **03**
(b) Explain briefly the Mohr's circle for stress analysis. **04**
(c) Explain the Bauschinger effect. **07**
- OR**
- Q.3** (a) What are the defects in the rolling process? **03**
(b) Draw and explain the graphical representation of yield criteria for both Von-Mises and Tresca theories in brief. **04**
(c) Explain any one rolling mill in detail. **07**
- Q.4** (a) What are the defects in the extrusion process? **03**
(b) Briefly explain about the compound dies. **04**
(c) Explain: (i) direct extrusion (ii) indirect extrusion **07**
- OR**
- Q.4** (a) How the extrusion load is calculated using the slab method? **03**
(b) What is the wire drawing process? What are defects that can be observed during the wire drawing operation? **04**
(c) Explain slip line theory with upper and lower bound theorem **07**
- Q.5** (a) Define: i) shearing ii) punching iii) blanking. **03**
(b) Explain the spring-back effect. **04**
(c) Explain the following: **07**
(i) Stress-strain in bending
(ii) Stresses in deep drawing operations
- OR**
- Q.5** (a) Give a brief idea about machines used for forging. **03**
(b) Explain the principle of the high energy rate forming method. **04**
(c) Explain explosive forming. **07**
