

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2017****Subject Code: 2171913****Date: 02/11/2017****Subject Name: Metal Forming Analysis (Department Elective - I)****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.

| | | MARKS |
|------------|--|--------------|
| Q.1 | (a) Explain clearance in sheet metal operation. | 03 |
| | (b) How do you represent strain hardening effect? | 04 |
| | (c) State general advantages of metal forming. | 07 |
| Q.2 | (a) Define (i) dry drawing (ii) wet drawing (iii) tube drawing. | 03 |
| | (b) State difference between hot forming and cold forming. | 04 |
| | (c) What do you understand by camber of sheet and camber of roll? | 07 |
| OR | | |
| Q.3 | (c) Explain two dimensional Mohr's Stress circles. | 07 |
| | (a) What do you understand by shear on punch and die? | 03 |
| | (b) Explain spring back effect in bending process. | 04 |
| | (c) State and prove Hencky's First theorem. | 07 |
| OR | | |
| Q.3 | (a) Define angle of bite and discuss its effect in rolling process. | 03 |
| | (b) State various factors which affect the FLD (Forming Limit Diagram). | 04 |
| | (c) Explain VonMises & Tresca theory of yielding. | 07 |
| Q.4 | (a) State types of rolling mills used in rolling process. | 03 |
| | (b) Differentiate direct and indirect extrusion process. | 04 |
| | (c) What is drawability? List and discuss factor affecting to drawability. | 07 |
| OR | | |
| Q.4 | (a) What is upset forging? | 03 |
| | (b) What are the benefits of hydrostatics extrusion process? | 04 |
| | (c) Explain Isotropic and Kinematic work hardening with neat sketches. | 07 |
| Q.5 | (a) Why friction measurement is necessary in forming process? | 03 |
| | (b) How is impression die forging different from closed die forging. | 04 |
| | (c) A circular cylinder of 100 mm diameter and 160 mm height is compressed to 40 mm height between two flat dies at 1000 ⁰ C. taking that there is a sticking friction over the entire contact area of disc, determine the maximum die pressure and average die pressure. The yield strength at 1000 ⁰ C is 75 N/mm ² . | 07 |
| OR | | |
| Q.5 | (a) Discuss on materials used for making wire drawing dies. | 03 |
| | (b) State difference between compound and progressive dies. | 04 |
| | (c) How does hydrostatic pressure affect the yield strength of metal? | 07 |