Seat No: _____ **Enrollment No: _____**

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

M.Tech. Summer 2018 - 19 Examination

Semester: 2 **Date: 13/05/2019**

Subject Code: 203208183 **Time: 10:30am To 01:00pm**

Subject Name: Theory of Metal Forming **Total Marks: 60**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 A) Explain Bauschinger effect with neat sketch. **(05)**

B) Differentiate open and close die forging processes. **(05)**

C) Discuss the influence of various properties on behavior of material during metal forming. **(05)**

Q.2 **Answer the following questions. (Attempt any three) (Each five mark)** **(15)**

A) Derive relationship between (i) True Stress and Engineering Stress
(ii) True Strain and Engineering Strain.

B) Discuss the defect and remedy for the rolled products.

C) State and discuss various CAD/ CAM/ CAE tools available to model and analyze metal forming processes.

D) Explain plastic deformation of metal by slip and twinning.

Q.3 A) Compare region of safety for selecting appropriate theory of failure in order to design forming of ductile or brittle material. **(07)**

B) Discuss upper bound solution for metal forming. **(08)**

OR

B) Discuss slab method of forming analysis. **(08)**

Q.4 A) Describe variation of normal and shear stress with angle of application of stress (θ) for bi-axial state of stress. **(07)**

OR

A) Discuss slip line field method of forming analysis. **(07)**

B) Derive plane stress condition for two dimensional state of stress. **(08)**