

[This question paper contains 2 printed pages.]

Your Roll No.

3191

MEMORANDUM

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Paper—ME.556

PLASTICITY AND METAL FORMING

Time : 3 Hours

Maximum Marks : 100

(Write your Roll No. on the top immediately
on receipt of this question paper.)

Attempt any five questions.

All questions carry equal marks.

1. (a) Derive the expression for extrusion pressure for a slab through a conical die. 10
- (b) Draw slipline field hodograph for the extrusion of round bar in conical die. 10
2. (a) Explain the friction in forming processes. 10
- (b) Explain lubrication and wear in forming and how it affects the work done. 10
3. (a) What is upper bound theorem? 10
- (b) How does a high energy rate forming process differ from ordinary plastic deformation process? 10
4. (a) Explain explosive forming process. 10
- (b) Obtain expressions for the die-work interface pressure distribution in open die forging process. 10

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5. (a) Explain the construction of a hodograph for plane strain compression between two frictionless surfaces. 10
- (b) Explain dead metal zone in extrusion. 10
6. (a) Prove that the limiting reduction per pass in strip drawing is 86.6%. 10
- (b) What is Von Mises material? 10
7. (a) What is Tresca's yield criteria? 10
- (b) Explain invariants of strain deviator. 10
8. Write short notes on : 5×4
- (a) 3-dimensional state of stress
- (b) α and β slip lines
- (c) Maximum reduction in wire drawing
- (d) Closed die forging operation.