(b) Describe the hydrodynamic and their film lubrication during metal forming processes. (10)

UNIT – IV

8. (a) Describe the implicit and explicit formulations in detail. (10)

(b) Differentiate between Lagrangian and Eularian approaches in relation to finite element methods. (10)

9. (a) Describe in detailed note the discretization and shape function. (10)

(b) Explain the following : (10)

(i) Elasto-Plastic approximations

(ii) Stiffness matrices.

Roll No. .....

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M.Tech. 1st Semester (MAE) CBCS Scheme Examination– December, 2016

METAL FORMING ANALYSIS

Paper : MTMA21C1

Time : 3 hours ***Max. Marks : 100***

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note : Attempt **five** questions in all, selecting **one** question from each unit. Q. 1 is **compulsory**. All questions carry equal marks.

1. Explain the following :

(a) Types of Extrusion (4)

(b) Material Integration Schemes (4)

(c) True Stress and True Strain (4)

(d) Selection of Stress-Strain curve for cold working. (4)

(e) Sheet Metal Forming. (4)

UNIT – I

2. (a) Explain the yield criteria for ductile material with the help of a proper graphical representation. (10)

(b) Explain the upper and lower boundary methods in detail. (10)

3. Explain the following :

(a) Work hardening and Anisotropy in Yielding (10)

(b) Slip line field theory. (10)

UNIT – II

4. (a) Discuss the effect of temperature and strain rate in metal working. (10)

(b) The conventional stress-strain curve is lower than the true stress-strain curve in tension, while the opposite is correct in compression. Why ? (10)

5. (a) Explain and analyse the technological aspects of Forging process in detail. (10)

(b) Explain the following :

(i) Stretch forming

(ii) Deep Drawing

(10)

UNIT – III

6. (a) Explain the principle and mechanism of lubrication in metal forming processes. (10)

(b) Describe in brief lubricants used for rolling, forging and cold drawing. (10)

7. (a) Explicate about the boundary and extreme pressure as well as solid lubricants. (10)