

MATERIALS SCIENCE AND ENGINEERING BRANCH

EIGHTH SEMESTER – (REGULATIONS 2008)

ML 9033 – ROLLING & FORGING TECHNOLOGY

Time : 3 hrs

Max Marks:

100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1. What are Bulk deformation processes?
2. Justify the statement that Von – Mises yield criterion can be interpreted as maximum distortion energy criterion.
3. For many products, forming processes are preferable to castings. Give reasons.
4. Write down the differences between hot rolling and cold rolling.
5. How is the roll pressure distributed along the length of arc of contact?
6. What is the condition for Roll biting?
7. List out the strategies to reduce the roll forces.
8. Why is flash objectionable in a forging process?
9. What is Thread Rolling process?
10. Forged Steels are superior to other types of steels. Justify.

Part – B (5 x 16 = 80 Marks)

11. a. (i) Describe the various theories of yielding under a complex system of stresses. (10)
- (ii) Compare the results obtained by Von-Mises and Tresca criteria under plane stress and plane strain conditions. (6)
12. a. (i) What is the principle of Lubrication? (3)
- (ii) What are the major components of lubricants? Discuss about the lubricants used for Rolling and Forging processes. (13)

(OR)

- b. What are the various forces acting on the work piece during cold rolling? Derive the expression for the rolling load under cold rolling conditions.

13. a. Describe the following Rolling processes. (4 x 4 = 16)

- (i) Thread Rolling
- (ii) Tube Rolling
- (iii) Cold Swaging
- (iv) Rotary tube piercing

(OR)

b. Discuss about the various possible defects, their causes and remedies in Rolling processes.

14. a. Describe in detail the various equipments used for forging operation with neat sketches.

(OR)

b. Derive an expression for pressure required for forging in plane strain conditions assuring Coulomb's friction between the tool and the workpiece.

15. a. (i) Discuss about the materials used for cold forging process. (6)

(ii) Briefly describe the tests that are performed to determine the forgeability of materials. (10)

(OR)

b. Explain the precision forging and cold heading processes with diagrams.

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