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**B.E/B.TECH (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2014**

**MANUFACTURING ENGINEERING BRANCH**

**FOURTH SEMESTER**

**MF 8401 – METAL FORMING AND POWDER METALLURGY**

**(REGULATIONS 2012)**

Time: 3 Hrs

Max. Marks: 100

Answer All Questions

**PART – A (10 x 2 = 20 Marks)**

1. Classify metal forming process.
2. State the differences between slip and twinning.
3. State the differences between open and closed die forging.
4. Compare relative unit costs for forging and casting processes.
5. What the differences between drawing and deep drawing process?
6. What are the characteristic of superplastic material?
7. State the differences between conventional and high speed forming.
8. State the advantages and disadvantages of isothermal forming.
9. How powder materials are characterised?
10. Compare components prepared by casting, forging and powder metallurgy.

**PART – B (5 x 16 = 80 Marks)**

11. With simple sketches briefly explain the various stages involved in the preparation of powder metallurgy components. (16)
- 12a. (i) State the differences between hot working and cold working. (8)
- 12a. (ii) Define engineering stress, engineering strain, true stress and true strain with equations. (8)

OR

12b. Describe the following with neat sketches

- i. Elastic and Plastic deformations (6)
- ii. Strain hardening (6)
- iii. Points and line defects (4)

13a. Write briefly about the following with neat sketches.

- i. Forging defects (8)
- ii. Various types of tube drawing operations (8)

OR

13b. Write briefly about the following with neat sketches.

- i. Mannesmann process (8)
- ii. Extrusion defects (8)

14a (i). Write briefly about formability of sheet metals. (10)

(ii). State the differences between blanking and fine blanking. (6)

OR

14b. (i) Explain explosive HERF process with neat sketches. (12)

(ii) Explain economics of sheet metal forming processes. (4)

15a. State the differences between hot and cold isostatic pressing with neat sketches. (16)

OR

15b. Explain rubber pad forming and hydro forming with simple sketches. (16)