Printed Pages : 4   **TME – 403**

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 4081   Roll No. | | | | | | | | | |

B. Tech.

(SEM. IV) EXAMINATION, 2008-09
MANUFACTURING SCIENCE - I

Time : 3 Hours]   *[Total Marks : 100*

Note : (1)   Attempt **all** questions.

(2)   All questions carry **equal** marks.

(3)   Be precise in your answer.

(4)   No second answer book will be provided.

1   Attempt any **four** parts of the following :   5×4

(a)   Discuss briefly the importance of manufacturing in 21st century in India.

(b)   What is manufacturing? How will you classify manufacturing processes? Give suitable example of products being made by manufacturing processes.

(c)   Describe the elastic and plastic behavior of metals. Also discuss the factors affecting the plastic deformation.

4081]   **1**   **[Contd..**

(d) What do you understand by yield's criterions for ductile materials? Find out the relation between Von-Mises' and Tresca yield criteria.

(e) Enlist the various hot and cold working processes. Compare the advantages and disadvantages of the hot and cold working processes.

(f) Derive the equation for the pressure distribution for the forging of rectangular block (bxhxw) in case of sliding friction.

2   Attempt any **two** parts of the following :   10×2

(a) Determine the maximum forging load of a metallic component 25mm × 25mm × 150mm. The yield stress in simple tension is 7MPa. The component is pressed between flat dies to a size 6mm × 100mm × 150 mm. The coefficent of friction μ =0.20. Consider the mixed friction case.

(b) Prove that in case of rolling,

$$Max.Draft = \mu^2 R,$$

Where, μ is the coefficient of friction, R is the radius of roll.

(c) List and explain the defects commonly observed in metal forming processes.

3   Attempt any **two** parts of the following :   **10×2**

  (a)   With the help of neat sketch, compare the compound die with progressive die. Give a neat sketch, describe constructional features and working of progressive die.

  (b)   How can the cutting force be reduced in blanking operation? Estimate the blanking force to cut a blank of 25mm wide and 30mm long from a 1.5mm thick metal strip, if the ultimate shear stress of the material is 450 N/mm². Also determine the work done, if the percentage penetration is 25% of the material thickness.

  (c)   What is the difference between blanking and piercing? Explain with neat sketch, deep drawing process.

4   Attempt any **two** parts of the following   **10×2**

  (a)   Write short notes on

    (i)   Explosive forming

    (ii)   Electro hydraulic forming process

  (b)   Explain the basic steps of the powder metallurgy process. Explain in brief about "Sintering". Why sintering is done in a controlled manner?

  (c)   Write short notes on

    (i)   Welding of plastics

    (ii)   Resins and Adhesives.

5   Attempt any **two** parts of the following :   10×2

(a)   Explain the design consideration of open and closed riser.

(b)   Explain with neat sketch various types of patterns. Discuss pattern allowances.

(c)   Write short notes on :

(i)   Investement casting

(ii)   Centrifugal casting.