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B.Tech.
(SEMESTER-IV) THEORY EXAMINATION, 2012-13
MANUFACTURING SCIENCE-I

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

SECTION – A

1. Attempt **all** question parts. $10 \times 2 = 20$

    (a)   Classify Manufacturing process.

    (b)   Differentiate between open die forging and closed die forging.

    (c)   Why are a number of passes required to roll a steel bar ?

    (d)   How are collapsible tubes produced ?

    (e)   What is ironing as applied to sheet metal work ?

    (f)   Distinguish between Blanking and Piercing operations.

    (g)   What is the use of powder metallurgy process ?

    (h)   What is the rotational moulding of plastics ?

    (i)   Define the term Fettling.

    (j)   State any four properties of Moulding sand.

SECTION – B

2. Attempt any **three** question parts. $10 \times 3 = 30$

    (a)   (i)   Write short notes on economic and technological considerations in manufacturing.

          (ii) Differentiate elastic and plastic deformation.

    (b)   Explain Rolling mills and their classification with sketches.

    (c)   (i)   List out the common sheet metal operations with suitable sketches.

          (ii) Estimate the blanking force to cut a blank 25 mm wide and 30 mm long from a 1 mm thick metal strip if the ultimate shear stress of the material is 450 N/mm^2. Also determine the work done if the percentage is 25% of the material thickness.

(d) Explain the mechanism of explosive forming and indicate its application.

(e) Indicate the common defects of casting. State their causes and remedies.

SECTION – C

Attempt **all** question. $10 \times 5 = 50$

3. Attempt any **two** parts : $5 \times 2 = 10$

(a) Compare hot and cold working processes.

(b) Briefly discuss about drop forging operations.

(c) List the various defects in metal forming processes.

4. Attempt any **one** part : $10 \times 1 = 10$

(a) In a wire drawing operation initial wire diameter is 5.5 mm and the final wire diameter is 5 mm. Die angle is 16°, die land length is 3 mm and co-efficient of friction is 0.1 Find the drawing load. $\sigma_0 = 240$ N/mm^2.

(b) Describe the manufacturing process of pipes and tubes.

5. Attempt any **one** part : $10 \times 1 = 10$

(a) A washer with a 12.7 mm internal hole and an outside diameter of 25.4 mm is to be made from 1.5 mm thick strip of 0.2 percent carbon steel. Considering the elastic recovery of the material, find (i) the clearance (ii) blanking die-opening size (iii) the blanking punch size (iv) the piercing punch size (v) the piercing die opening size.

(b) Describe the various methods of bending operations with neat sketches.

6. Attempt any **one** part : $10 \times 1 = 10$

(a) Discuss about the process of making a powder metallurgy product having improved properties.

(b) Sketch and explain injection moulding process. List the products that can be produced from it.

7. Attempt any **two** parts : $5 \times 2 = 10$

(a) Summarize the principles of design of casting.

(b) List the different tools and equipments used in foundries and indicate its importance.

(c) Discuss about investment casting process.

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