



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

**PAPER ID : 140403**

Roll No.

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## B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15  
MANUFACTURING SCIENCE - I

Time : 3 Hours]

[Total Marks : 100

Note : Attempt all the questions. Assume missing data suitably.

Attempt any two of the following questions-

**10x2=20**

- 1 (a) What is manufacturing? How will you classify manufacturing process? Give suitable example of products being made by manufacturing process.
- (b) Enlist the various (different). cold and hot working processes. Compare hot working and cold working process. Indicating advantages and disadvantages of each.
- (c) A metal work piece has size 200mm×100mm×150mm (b×h×w). Assuming plain strain forging under sticking friction condition, calculate the peak pressure. The material has a yield stress in uniaxial tension of 160 MPa.

Attempt any two of the following questions :

**10x2=20**

2 (a) Write short note on :

- (i) Forward Extrusion
- (ii) Backward Extrusion

(b) Derive the expression for drawing stress  $\sigma_{xa}$  for wire drawing through a conical die with  $2\alpha$  dies angle and  $\mu$  coefficient of friction as -

$$\sigma_{xa} = (1 + B/B) \left[ 1 - (D_a / D_b)^{2B} \right] \text{ where } B = \mu \cot \alpha$$

(c) What do you mean by friction hill rolling . Drive a relation to determine roll separating forces.

Attempt any two of the following questions :

**10x2=20**

3 (a) Describe the process for washer making with the help of progressive die. How does compound die differ from progressive die ?

(b) What. is the rate of clearance in blanking and piercing operations? How are clearances provided in punch and die? On what factors die and punch clearance depends. Discuss them in detail.

(c) Describe following type of bending :

- (i) V- bending
- (ii) U- bending
- (iii) Edge bending

Attempt any two of the following questions-

**10x2=20**

- 4
- (a) Explain the terms "pattern" and " pattern allowances". What are different types of allowances provided when making a pattern? Explain each in brief.
  - (b) Write short note on :
    - (i) Centrifugal casting
    - (ii) Casting defects
  - (c) Explain the design consideration of open and closed riser.

Attempt any four of the following questions-

**5×4=20**

- 5
- (a) Enlist unconventional metal forming processes and briefly describe with neat sketch, working and applications of explosive forming.
  - (b) Mention the advantages, limitations & applications of powder metallurgy. Describe each step involved in powder metallurgy.
  - (c) Describe the 3-2-1 principle of location.
  - (d) Differentiate between thermosetting and thermoplastic.
  - (e) Explain briefly the principle of jig and fixture design.
  - (f) Write short note on "Electro hydraulic forming process".