

Printed Pages : 3



EME402

(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".
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