Printed Pages: 02 **Sub Code: EME402**

Paper Id: **140402** **Roll No.** | | | | | | | | | | |

B TECH
(SEM IV) THEORY EXAMINATION 2017-18
MANUFACTURING SCIENCE-I

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

Note: 1. Attempt all Sections. Assume any missing data suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10= 20

a) Define the term manufacturing. Also classify manufacturing systems.
b) Differentiate blanking and punching.
c) Differentiate between bending and drawing.
d) Define rolling.
e) Define the term deep drawing.
f) Differentiate between Runner and riser.
g) Distinguish between jig and fixtures.
h) Explain the principle of high energy rate forming
i) Differentiate between solid pattern and split pattern
j) Define the term thermo plastics.

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a) Differentiate between hot forming and cold forming. Also explain warm forming.

b) A metal strip has size 250 mm*150 mm *100 mm assuming plain strain forging under sliding condition calculate peak pressure the material has yield stress in uniaxial tension of 180 MPa.

c) Explain with the help of neat sketch mechanism of material deformation in rolling process. Also explain different types of rolling mill.

d) What do you mean by term investment casting? Also explain detail step of precision casting.

e) Explain with help of neat sketch electrohydraulic forming with their application and limitations.

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

a) What do you mean by the term recrystalisation temperature? Also explain closed die forging.

b) Show the forging of strip of cross section b*h under mixed friction condition X_s is the distance from centre line of this strip where sticking friction end is given by

$$X_s = b/2\mu - h/2\mu \log_e(1/2\mu)$$

Where μ is the coefficient of friction and 'h' is the height of strip

What will be the value of forging pressure at X_s.

4. Attempt any *one* part of the following: 10 x 1 = 10

a) Define extrusion. Classify extrusion. Also explain hydrostatic extrusion with their merits and demerits

b) What do you mean by friction hill rolling? Derive the expression for roll separating forces.

5. Attempt any *one* part of the following: 10 x 1 = 10

a) Write down the detail step involved in washer making. How does compound die differ from progressive die?

c) Distinguish between spinning and cup drawing. Why is it necessary to provide proper clearance between the punch and die in shearing operation? Give proper reason

6. Attempt any *one* part of the following: 10 x 1 = 10

a) Distinguish between casting and pattern. Explain the properties of molding sand.

b) Explain with neat sketch explain centrifugal casting. Also write down their merits and de merits.

7. Attempt any *one* part of the following: 10 x 1 = 10

a) What do you understand by polymerization? Explain with neat sketch injection molding with their advantages and disadvantages.

b) What is powder metallurgy? Explain in detail step involved in powder metallurgy. Also write down the applications of powder metallurgy.