Printed Pages: 02 **Sub Code: NME402**

Paper Id: | 1 | 4 | 0 | 4 | 0 | 8 | **Roll No.** | | | | | | | | | | |

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

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

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

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

a. What is the power metallurgy? What is the use of power metallurgy process?
b. Differentiate between coining and embossing.
c. Which process is called lost wax process? Why?
d. Differentiate between riser and runner.
e. What are the different pattern allowances?
f. Define lancing and notching operations.
g. What are the difference between a wire drawing operation and extrusion?
h. Define neutral point and forward slip for a rolling operation.
i. Differentiate between hot working and cold working.
j. What are the advantages of open die and closed die forging process?

SECTION B

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

a. Derive the expression for load estimation with sliding friction for slab of forging process.
b. Explain the working principle, advantages and disadvantages of injection moulding.
c. Classify the unconventional metal forming process. What is electromagnetic forming process? Also state the applications and advantages of electromagnetic forming.
d. Briefly explain mechanism of rolling process. Also derive the relation for maximum draft obtained in rolling process.
e. What are the advantages of bottom gating system? Derive the expression for the bottom gating system, time taken to fill the mould cavity.

SECTION C

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

(a) What is rolling mill? Explain different types of rolling mill with suitable diagram.
(b) What is extrusion? List the types of extrusion. List and Explain the defects of extrusion.

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

(a) Write a short note on solidification of casting and CAINE's method for design of riser.
(b) What is moulding sand? List the different types of moulding sand. What are the characteristics of moulding sand?

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

(a) What is spring back phenomenon in bending? A piece of metal 2.5 mm thick is bend to an angle of 90 degree with an inner radius of 6.5 mm. What is the original length of metal which goes into the bend?

(b) What is deep drawing? Discuss deep drawing operations. Also explain various defects in deep drawing.

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

(a) What do you understand by yield criteria? What are the assumptions in yield criteria? Explain Tresca's yield criteria and compare it with Von-mises yield criteria.

(b) Describe the following in brief:

i. Centrifugal casting
ii. Investment casting
iii. Stir casting
iv. Continuous casting

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

(a) What are unconventional metal forming processes? Briefly describe with neat sketch explosive forming process? What are their applications?

(b) Why are jigs and fixtures used? Discuss the principles of locating and clamping a work piece with neat sketches.