

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

15MA53

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019

Metal Forming

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. How are metal working processes classified? (06 Marks)
b. Briefly explain Tresca and Von Mises criteria. The state of stress at a point in a material is given by $\sigma_x = 100\text{MPa}$, $\sigma_y = 200\text{MPa}$, $Z_{xy} = 250\text{MPa}$. If yield strength of material is 400MPa, determine in uniaxial test whether yielding will occur. If so according to which criteria. (10 Marks)

OR

- 2 a. Write a short note on : i) Deformation zone geometry ii) Residual stresses in wrought product. (08 Marks)
b. Differentiate between hot working, cold working and warm working. (08 Marks)

Module-2

- 3 a. With neat sketch, explain forging hammers and press forging. (08 Marks)
b. A block of lead 25mm × 25mm × 150mm is pressed between flat dies to a size 6.25mm × 100mm × 150mm. If uniaxial flow stress is $\sigma_0 = 6.9\text{ MPa}$ and $\mu = 0.05$. Determine pressure distribution over 100mm ($x = 0, 30, 60$) and Total forging load. (08 Marks)

OR

- 4 a. Sketch and explain any 2 types of rolling mills. (06 Marks)
b. With neat sketch, explain thread rolling and ring rolling. (10 Marks)

Module-3

- 5 a. Explain with sketch, following extrusion processes : (08 Marks)
i) Cold extrusion ii) Hydrostatic extrusion.
b. Explain variables influencing extrusion processes. (08 Marks)

OR

- 6 a. Explain with neat sketch, different types of tube drawing processes. (12 Marks)
b. Briefly explain the metal flow pattern in the extrusion process with and without lubrication. (04 Marks)

Module-4

- 7 a. Explain Spring back effect with respect to bending. (06 Marks)
b. What is significance of redrawing? Briefly explain two different methods of redrawing. (10 Marks)

OR

- 8 a. Explain with sketch following operations in sheet metal forming : (08 Marks)
i) Rubber forming ii) Stretch forming.

- b. Explain with sketches working of progressive and compound die arrangements in sheet metal forming. (08 Marks)

Module-5

- 9 a. Briefly explain different methods of powder production in powder metallurgy. (08 Marks)
b. List the applications of powder metallurgy components. (04 Marks)
c. What is Sintering? Explain the mechanism. (04 Marks)

OR

- 10 With neat figure explain :
a. Explosive forming.
b. Electro magnetic forming.
c. Electro hydraulic forming. (16 Marks)
