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Sixth Semester B.E. Degree (CBCS) Examination

Metal Forming

Time: 3 hrs.

Max. Marks: 80

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

MODULE – I

- 1 a Explain the classification of metal working processes on the basis of force applied with neat sketches. (10 Marks)
b Explain Tresca's and von Mises's yield criterions. (06 Marks)

OR

- 2 a Obtain the relationship between (a) true strain and engineering strain and (b) true stress and engineering stress. (06 Marks)
b Explain hot working and cold working. Mention the advantages, disadvantages and effects of hot working. (10 Marks)

MODULE – II

- 3 a Explain the effect of strain rate or deformation velocity on metal forming. (06 Marks)
b Explain the concept of friction hill and the factors affecting friction hill in forging. (06 Marks)
c Explain hydrostatic pressure in metal working with a neat sketch. (04 Marks)

OR

- 4 a Explain the effects of temperature, friction and lubrication in metal working. (12 Marks)
b Briefly explain any four forging defects. (04 Marks)

MODULE – III

- 5 a Explain with neat sketches tandem mill and four high rolling mill. (08 Marks)
b Explain optimal cone angle and dead zone formation in drawing with sketches. (08 Marks)

OR

- 6 a Explain with neat sketches the wire drawing and rod drawing operations. (08 Marks)
b Explain the defects in rolled products with neat sketches. (08 Marks)

MODULE – IV

- 7 a Explain extrusion piping and Chevron cracking defects in extrusion. Estimate the capacity of the hot extrusion press to extrude I-section of 20 mm height with 10 mm wide flanges and 2 mm thick, using 30 mm diameter bar stock of an aluminium alloy. Take the yield strength of an aluminium alloy as 150 N/mm². Assume 25% frictional losses and a square die. (08 Marks)
b With neat sketches, explain rubber forming and stretch forming. (08 Marks)

OR

- 8 a Explain any four extrusion process variables with sketch. (06 Marks)
b Explain combination die and progressive die with neat sketches. (10 Marks)

MODULE – V

- 9 a Explain the electro-magnetic forming with a sketch. List its advantages, disadvantages and applications. (08 Marks)
b With a flow chart, explain the basic steps in powder metallurgy process. (08 Marks)

OR

- 10 a Explain the unconfined type or stand off technique of explosive forming with a sketch. List its advantages, disadvantages and applications. (08 Marks)
b Explain atomization with sketch and electrolytic deposition. (05 Marks)
c Briefly explain continuous roll compaction with sketch. (03 Marks)

2. Any revealing of identification, appeal to evaluator and /or equations written e.g, 38+2 = 40, will be treated as malpractice.

Important Note: 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.