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10ME55

Fifth Semester B.E. Degree Examination, June/July 2015
Manufacturing Process – III

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. With neat sketches, explain the classification of metal working processes on the basis of force applied. (10 Marks)
- b. Differentiate between cold working and hot working. (05 Marks)
- c. Explain the concept of true stress and true strain. (05 Marks)
- 2 a. Explain with a neat sketch, the hydrostatic pressure in metal working. (05 Marks)
- b. Explain the effect of following on metal working processes:
i) Friction ii) Lubrication iii) Strain rate (15 Marks)
- 3 a. List and explain die design parameters in forging. (06 Marks)
- b. Write a note on material flow lines in forging. (04 Marks)
- c. With a neat sketch, explain any two forging equipments. (10 Marks)
- 4 a. With neat sketches, explain the different types of rolling mills. (10 Marks)
- b. Explain the friction hill in rolling process. (04 Marks)
- c. A 300 mm wide aluminium alloy strip is hot rolled from an initial thickness of 25 mm to a final thickness of 15 mm. The diameter of the rolls is 1 m and speed of rotation is 120 rpm. The plane strain flow stress is 70 Mpa at the entrance of rolls and 110 Mpa at the exit from the roll gap due to increasing velocity. Find the rolling load and power required. Assume $\mu = 0.25$ and $\lambda = 0.5$. (06 Marks)

PART – B

- 5 a. What is drawing? With a neat sketch explain the process of rod drawing. (08 Marks)
- b. Classify the different processes used in tube drawing. With the help of suitable sketch explain the process of moving mandrel. (06 Marks)
- c. Explain optimal cone angle and dead zone formation in drawing. (06 Marks)
- 6 a. With a neat sketch, explain backward extrusion process. Why power involved in backward extrusion is much lesser than direct extrusion. (07 Marks)
- b. Briefly explain the metal flow pattern in the extrusion process with and without lubrication. (06 Marks)
- c. List and explain the various defects in extrusion. (07 Marks)
- 7 a. With neat sketches, explain the working of progressive die and combination die arrangement in sheet metal working. (10 Marks)
- b. With neat sketches explain the following processes:
i) Roll bending ii) Deep drawing. (10 Marks)
- 8 a. With a neat sketch, explain electrohydraulic forming process. (06 Marks)
- b. With a flow chart explain the operations involved in making powder metallurgy parts. (08 Marks)
- c. List the applications of powder metallurgy components. (06 Marks)

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Important Note : 1. On completing your answers, immediately draw diagonal cross lines on the remaining blank spaces.
2. Any revealing of identification, applied to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.